

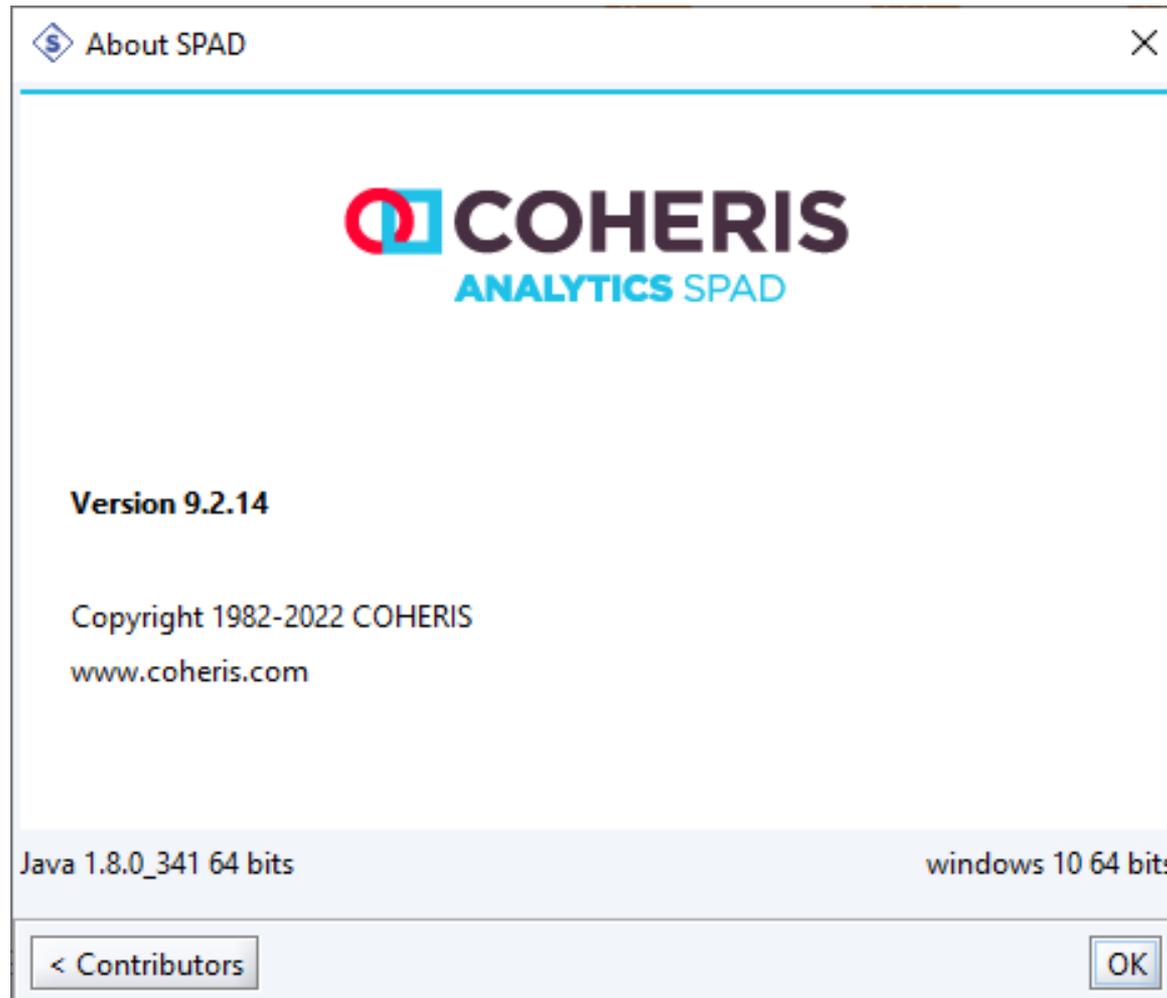


Introducing SPAD software

Fall School on GDA - November 20th – 23rd 2023



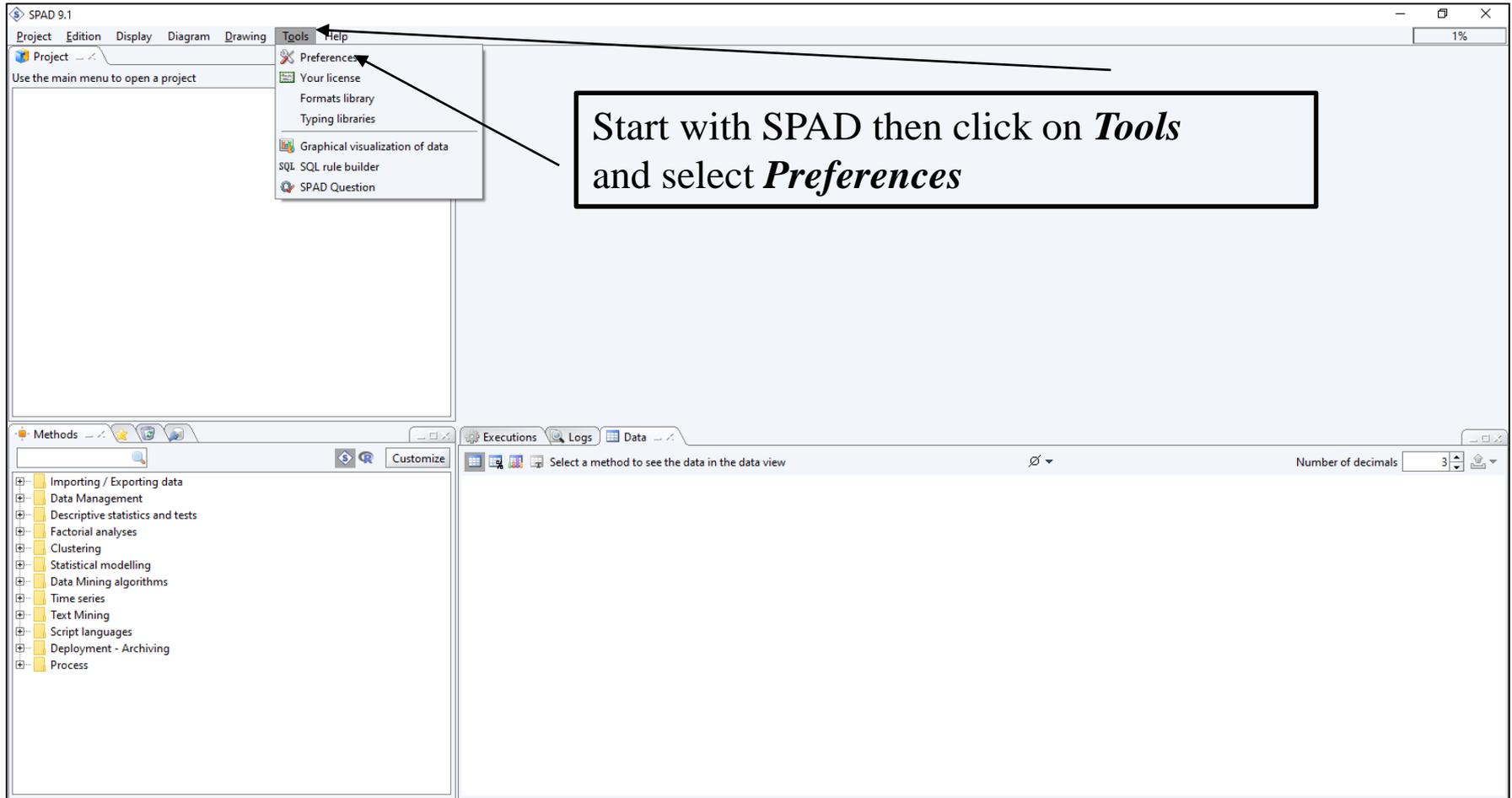
About SPAD



Session outline

- Setup and adjusting parameters
- General principles of SPAD
- Learning with a data sample
- How to archive a project and open it
- Answering questions

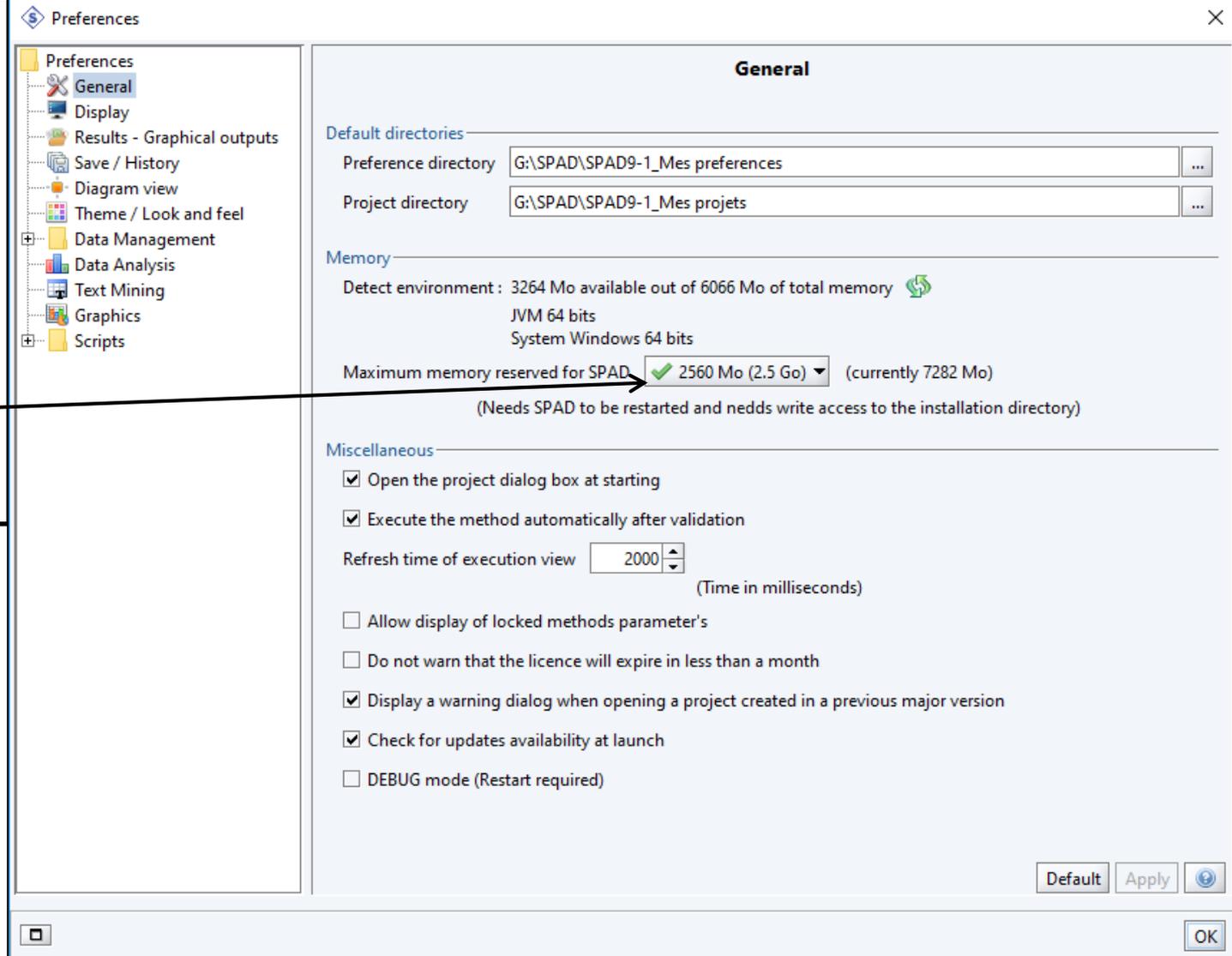
Starting with SPAD



Preferences

Choose and/or note directories where are *Preferences* (what we are now establishing) and *Projects*.

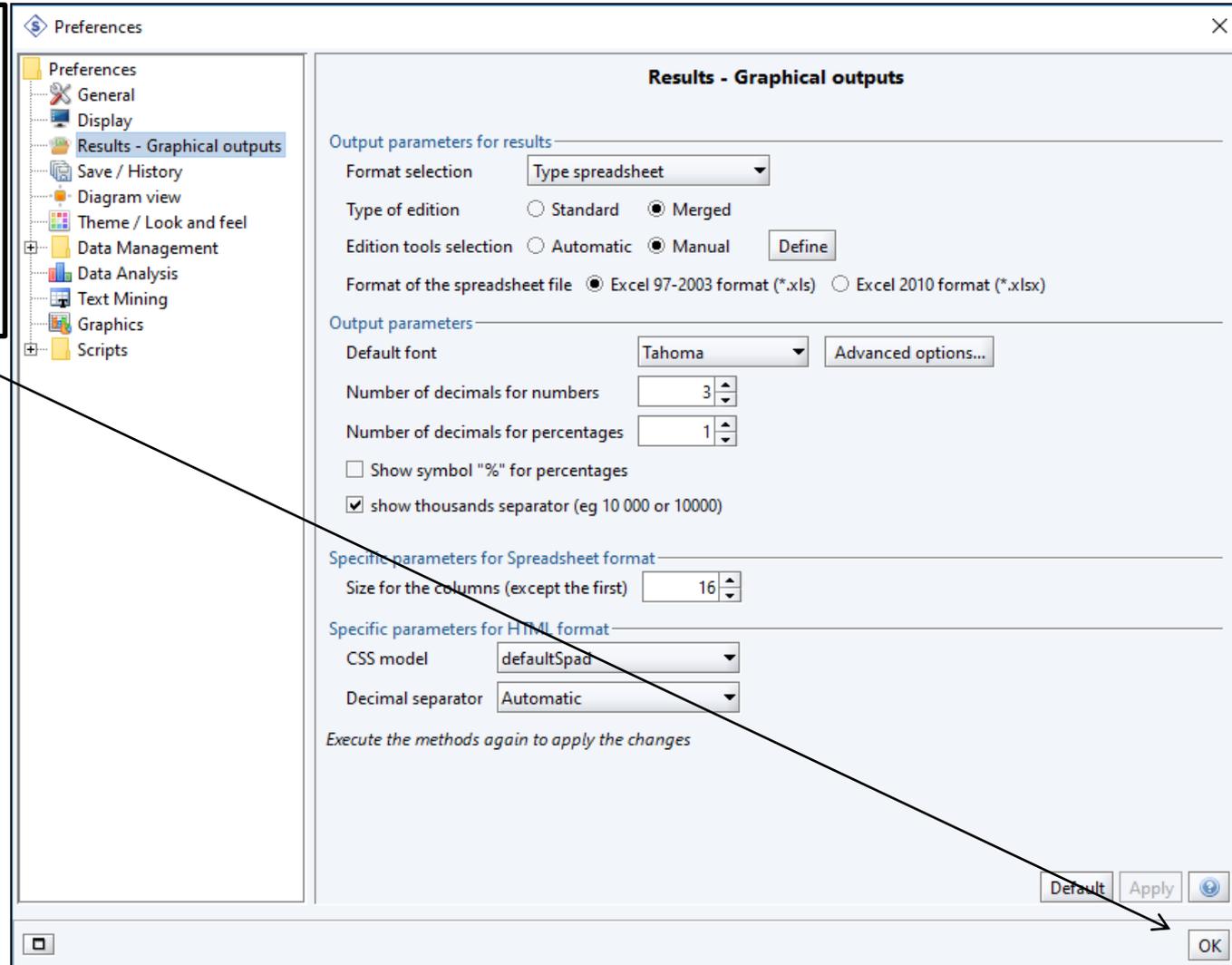
Increase, if necessary, size of allocated memory.



Preferences

Choose format under which results must be provided.

Then click OK



The 4 windows of SPAD

- 1 – Project window (top, left) includes diagrams.
- 2 – Methods window (bottom, left) includes all methods available in SPAD.
- 3 – Diagram window (top, right) shows, in graphic form, methods used.
- 4 – Executions, Logs, Data window (bottom, right) allows to see data.

The screenshot displays the SPAD 9.1 interface for a project named 'Loisirs_2013'. The interface is divided into four main windows, each highlighted with a circled number:

- 1 (Project window):** Located at the top left, it shows a tree view of the project structure including 'Process diagram', 'Lecture et recodage', 'ACM et CAH', and 'Archived data'.
- 2 (Methods window):** Located at the bottom left, it lists various statistical and data mining methods such as 'Importing / Exporting data', 'Data Management', 'Descriptive statistics and tests', 'Factorial analyses', 'Clustering', 'Statistical modelling', 'Data Mining algorithms', 'Time series', 'Text Mining', 'Script languages', 'Deployment - Archiving', and 'Process'.
- 3 (Diagram window):** Located at the top right, it displays a flowchart of the data processing pipeline. The steps include: 'Automatic graphic generator' (input), 'Loisirs.data', 'création de l'identificateur ID de l'individu', 'Missing data handling', 'Construction des variables chaîne et livres', 'Binning - Grouping Crossing', 'New variables generator', 'Binning - Grouping Crossing_1', 'Binning - Grouping Crossing_2', 'Sélection et ordre des variables', 'Formats', 'Standard statistics', 'Filtre logique', and 'Loisir_ACM' (output).
- 4 (Executions window):** Located at the bottom right, it shows a table of execution logs. The table has columns for Level, Element, Stop, Status, Logs, Indicator, Start, Time, and Results.

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	Loisirs.data		Locked			5004 17:55 (06/09/2014)	00:01,343	
1	création de l'identificateur l...		Completed (Ok)			5004 17:55 (06/09/2014)	00:00,219	
2	Missing data handling		Completed (Ok)			5004 17:55 (06/09/2014)	00:00,125	
3	Construction des variables ...		Completed (Ok)			5004 17:55 (06/09/2014)	00:00,109	
4	Binning - Grouping Crossing		Completed (Ok)			5004 17:55 (06/09/2014)	00:00,219	
5	New variables generator		Completed (Ok)			5004 17:55 (06/09/2014)	00:00,78	
6	Binning - Grouping Crossin...		Completed (Ok)			5004 17:55 (06/09/2014)	00:00,47	
7	Binning - Grouping Crossin...		Completed (Ok)			5004 17:55 (06/09/2014)	00:00,109	
8	Sélection et ordre des varia...		Completed (Ok)			17:55 (06/09/2014)	00:00,16	
9	Formats		Completed (Ok)			5004 17:55 (06/09/2014)	00:00,141	
10	Standard statistics		Not started			18:21 (02/09/2013)	00:00,94	
1	Selection - Order		Completed (Ok)			17:55 (06/09/2014)	00:00,16	
1	Automatic graphic generator		Not started			19:18 (29/10/2013)	00:00,532	
10	Filtre logique		Completed (Ok)			4450 17:55 (06/09/2014)	00:00,375	
11	Loisir_ACM		Completed (Ok)			4450 18:00 (06/09/2014)	00:00,125	
2	loisir		Completed (Ok)			5004 18:00 (06/09/2014)	00:00,266	

Icon system in SPAD



Excel datasheet



SPAD Data Archive
file



Logical filter



Missing data
management



Standard statistics



MCA



Variable factor loading
archiving



Archiving



Anova - Ancova



Logistic regression



Words vocabulary
building



Lemmatizer



R Script

Methods in purple are importing or exporting methods

Methods in orange are data management methods

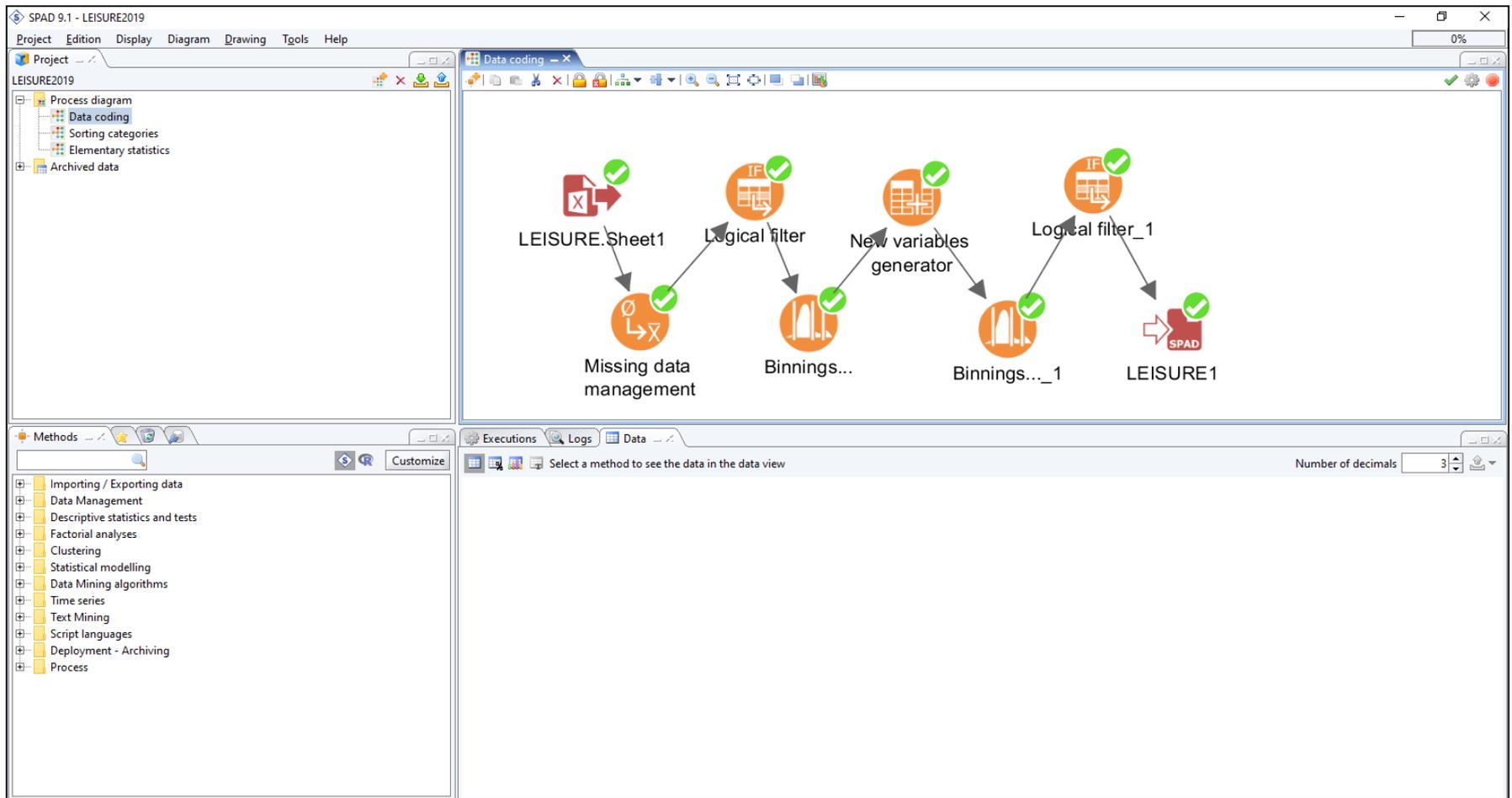
Statistical methods are in green

Archiving methods are in blue

Statistical modelling methods are in pigeon blue

Textual analysis procedures are in violet blue

Procedures implying script languages (R, Python) are in yellow



Methods status

All the SPAD methods have a status indicator in the top right corner of their icon. This indicator follows the nomenclature below:



Gray: method not configured.



Blue: method configured and validated, not executed.



Orange: method configured not validated due to **errors in the settings**.



Green: method executed, results available.



Yellow, green mark: method executed, results available with **warnings during method execution**.



Red cross: method executed, results not available due to **errors during method execution**.



Locked: The method can't be executed, results are available.

Leisure Example

- The Leisure example has been devised as a compromise between a mere illustration and a real case study; it should give a fair idea of how a large questionnaire can be analyzed by MCA and by using SPAD software.
- The data set has been constructed from 2008 survey on the cultural practices of French people. The survey was carried out by the Department of Studies and Prospective of French Ministry of Culture and Communication. In the survey, a sample of 5004 individuals aged 15 or more, representative of the French population, answered a very comprehensive questionnaire (90 questions). The sample was constructed by using the quota method (gender, age, PCS, number of persons in the household, woman activity), after stratification by program regions and agglomeration categories. The data collection was made at the person's home by using the CAPI system.

Leisure Example : data

- Sample : 5004 individuals aged 15 years or more, representative of French population; 125 questions.
- Data : Q=7 questions about leisure activities et 4 sociodemographic : sex, age, education and household income.
- O. Donnat (2009). Les pratiques culturelles des français à l'ère numérique. Paris, La Découverte.
- For a detailed analysis of the data set, see Le Roux B. (2014), Analyse géométrique des données multidimensionnelles, Paris: Dunod.

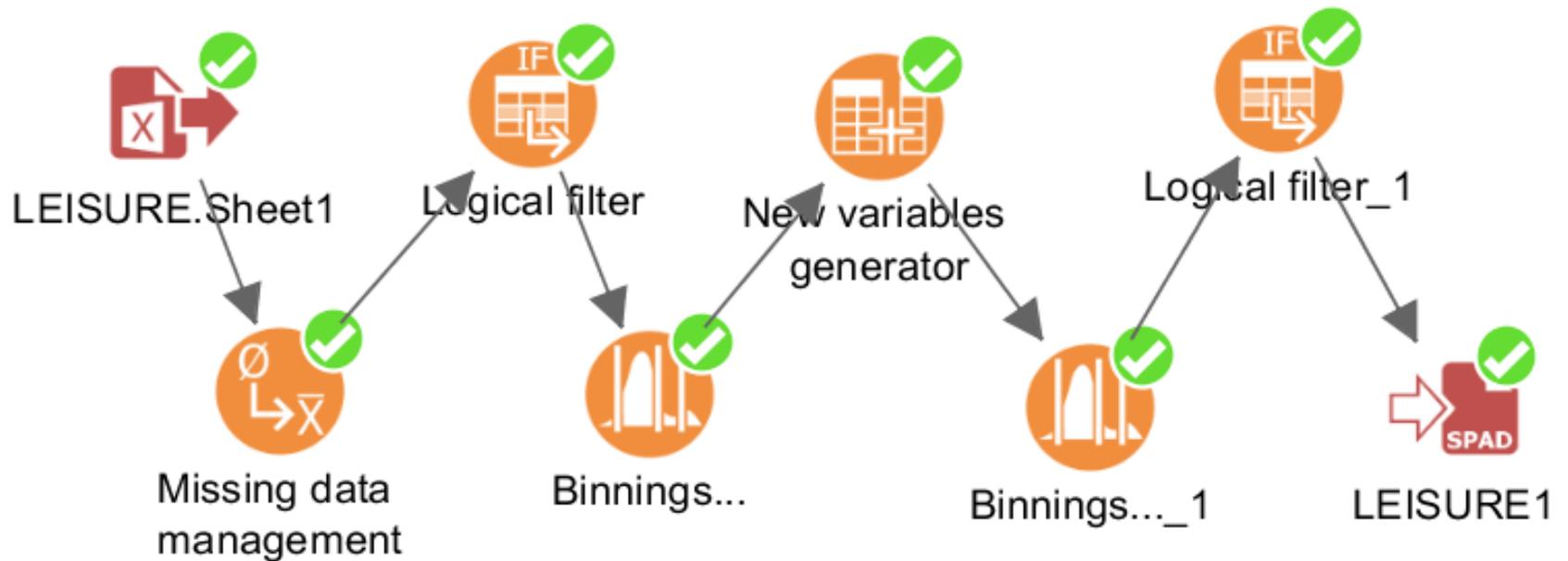
Leisure activities questions

- **Q1.** If you had more time, your first choice of activity would be : don't have time, to rest, to take courses to improve your work situation, to practice physical activities, to practice artistic activities, to develop your general knowledge, to take care of your family, to do some home DIY (gardening, etc.).
- **Q2.** When you go out in the evening, are you mostly : alone, with partner, with family (children, parents), with friends with whom you usually go out, with friends different from one time to the next, group outing, you don't go out in the evening ?
- **Q3.** Usually how often do you read a national or regional daily newspaper : every day, several times a week, once a week, more rarely, never or nearly never.
- **Q4.** As a general rule, when you watch television, you do it : rather alone, rather with somebody, it depends on the programs, it depends on the times of the day.
- **Q5.** Which TV channel do you prefer to watch (first choice or second choice) ? : TF1, France2, France3, Canal+, France5, Arte, M6, .
- **Q6.** Number of hours per week watching television : less than 5 hours, 5 to less than 10 hours, 10 to less than 20 hours, 20 to less than 35 hours, 35 hours and more.
- **Q7.** Number of books and comic strips read in the 12 past months : none, 1 to 4, 5 to 12, 13 to 40, 41 and more.

Sociodemographic variables

- **Sex** : male, female.
- **Age** : 18 – 25 years, 25-35 years, 35-45 years, 45-55 years, 55-65 years, more than 65 years.
- **Level of education** : none or primary school, CAP-BEPC, BAC–BP–BT, DEUG–DUT–BTS, Master-PhD, student.
- **Household Income** : <915€, 915-1219€, 1220-1524€, 1525-1904€, 1905-2289€, 2290-3049€, 3050-3809€, 3810-6099€, >6099€, unknown.

From Excel file to SPAD file with some data management





Excel datasheet

Importing Excel file

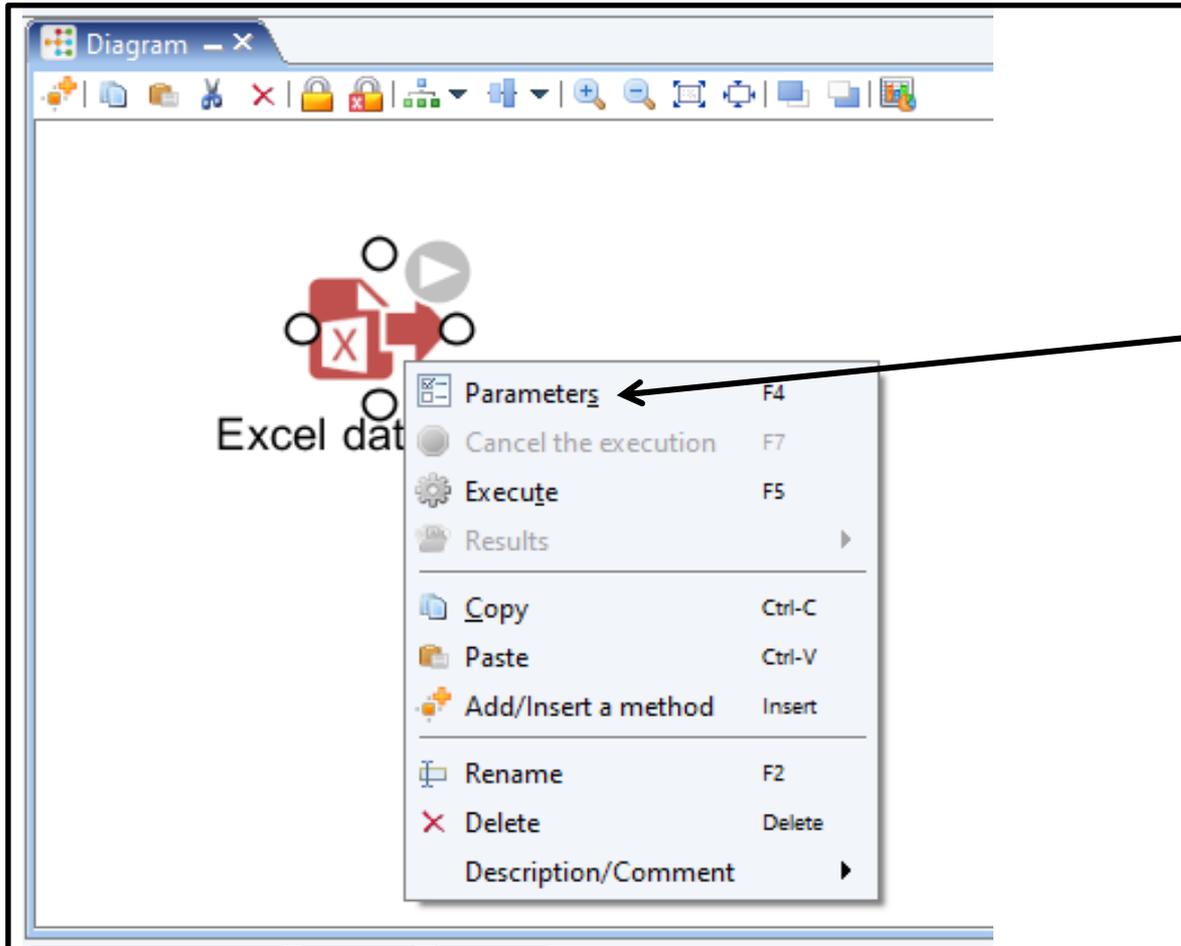
In the Methods window click on *Importing/Exporting data* and on *Imports* and on *Excel datasheet*. Drag the *Excel datasheet* icon and drop it in the Diagram window .

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	Excel datasheet		Not started					



Excel datasheet

Importing Excel file



Double click on *Excel datasheet* icon or right click and select *Parameters*



Importing Excel file

Excel datasheet

Import Excel datasheet

Data location

Excel file direct ...

Connection

Excel file

Sheet (2)

Parameters

Number of lines to ignore at the beginning of the file

Name of the variables on the first line Trim (suppress spaces at the beginning or end of chain)

Determination of column storage

Number of lines used Use the majority storage Maximum compatibility

Data view

Index	More time	Going out	NewsPaper	TV with	Channel-01	Channel-02	TPTVH	How many ...	How many ...	ComicStrips?	Age	Gender	Education
1		Going out:p...	everyday	TV with:so...	TF1	France3	15	6	20	no	25	male	Bac-BP-BT
2	rest	Going out:a...	everyday	TV with:alone	17	17	49	20	0	yes	68	male	CEP
3	home DIY	Going out:p...	<once/week	TV with:dep...	TF1	M6	81	5	1	no	26	female	DEUG-DUT-...
4	develop kn...	Going out:f...	<once/week	TV with:dep...	M6	TF1	14	20	20	no	19	male	Bac-BP-BT
5	home DIY	Going out:g...	everyday	TV with:so...	zapping		19	3	10	no	71	male	CEP
6	rest	Going out:f...	<once/week	TV with:dep...	Arte	Canal+	12	3	2	no	64	female	BEPC
7	home DIY		everyday	TV with:dep...	TF1	France2	30				77	female	CEP
8	take care of...	Going out:f...	<once/week	TV with:dep...	TF1	France2	11	10	0	no	32	female	CAP-BEP
9	develop kn...	Going out:p...	>once/week	TV with:so...	Arte	M6	12	24	0	no	41	female	MasterDess...
10		Going out:g...	never	TV with:alone	France3	17	24	50	0	no	67	female	aucun

Sample at import

Limit the number of imported rows Random sampling (probability)

Import Metadata

Ok Cancel



Typing variables

Excel datasheet

Import Excel datasheet

Default typing Custom typing Number of rows to ... 10000 Parameters

Index	Name	Import	New name	Storage	Role
1	ID	<input checked="" type="checkbox"/>	ID	String	Categorical
2	More time	<input checked="" type="checkbox"/>	More time	String	Categorical
3	Going out	<input checked="" type="checkbox"/>	Going out	String	Categorical
4	NewsPaper	<input checked="" type="checkbox"/>	NewsPaper	String	Categorical
5	TV with	<input checked="" type="checkbox"/>	TV with	String	Categorical
6	Channel-01	<input checked="" type="checkbox"/>	Channel-01	String	Categorical
7	Channel-02	<input checked="" type="checkbox"/>	Channel-02	String	Categorical
8	TPTVH	<input checked="" type="checkbox"/>	TPTVH	Integer	Continuous
9	How many books	<input checked="" type="checkbox"/>	How many books	Integer	Continuous
10	How many CS	<input checked="" type="checkbox"/>	How many CS	Integer	Continuous
11	ComicStripsIncluded?	<input checked="" type="checkbox"/>	ComicStripsIncluded?	String	Categorical
12	Gender	<input checked="" type="checkbox"/>	Gender	String	Categorical
13	Income	<input checked="" type="checkbox"/>	Income	String	Categorical
14	Age	<input checked="" type="checkbox"/>	Age	Integer	Continuous
15	Education	<input checked="" type="checkbox"/>	Education	String	Categorical
16	CSP42	<input checked="" type="checkbox"/>	CSP42	String	Categorical

Include automatically the new variables
 Sort the categories automatically by their natural order

Import Metadata

Ok Cancel

Import ▶ Yes
Storage ▶ No
Role ▶

Default typing on the selection
Custom typing on the selection

Import ▶
Storage ▶ String
Role ▶ Float
Integer
Date
Other

Default typing on the selection
Custom typing on the selection

Import ▶
Storage ▶
Role ▶ Continuous
Categorical
Textual
id Identifier
? Other

Default typing on the selection
Custom typing on the selection



Excel datasheet

Typing variables

Import Excel datasheet

Default typing | Custom typing | Number of rows to read: 10000 | Parameters

Index	Name	Import	New name	Storage	Role
1	ID	<input checked="" type="checkbox"/>	ID	String	id Identifier
2	More time	<input checked="" type="checkbox"/>	More time	String	Categorical
3	Going out	<input checked="" type="checkbox"/>	Going out	String	Categorical
4	NewsPaper	<input checked="" type="checkbox"/>	NewsPaper	String	Categorical
5	TV with	<input checked="" type="checkbox"/>	TV with	String	Categorical
6	Channel-01	<input checked="" type="checkbox"/>	Channel-01	String	Categorical
7	Channel-02	<input checked="" type="checkbox"/>	Channel-02	String	Categorical
8	TPTVH	<input checked="" type="checkbox"/>	TPTVH	Integer	Continuous
9	How many books	<input checked="" type="checkbox"/>	How many books	Integer	Continuous
10	How many CS	<input checked="" type="checkbox"/>	How many CS	Integer	Continuous
11	ComicStripsIncluded?	<input checked="" type="checkbox"/>	ComicStripsIncluded?	String	Categorical
12	Gender	<input checked="" type="checkbox"/>	Gender	String	Categorical
13	Income	<input checked="" type="checkbox"/>	Income	String	Categorical
14	Age	<input checked="" type="checkbox"/>	Age	Integer	Continuous
15	Education	<input checked="" type="checkbox"/>	Education	String	Categorical
16	CSP42	<input checked="" type="checkbox"/>	CSP42	String	Categorical

Include automatically the new variables
 Sort the categories automatically by their natural order

Import | Metadata

Ok Cancel



LEISURE.Sheet1

Successful Importing

The screenshot displays the SPAD 9.1 software interface. The main window, titled "Diagram", shows a process diagram with a central icon of a document with a red 'X' and a green checkmark, labeled "LEISURE.Sheet1". The left sidebar shows a project tree for "LEISURE2019" with a "Process diagram" folder containing the "Diagram" element. The bottom-left pane lists various statistical methods, including "Importing / Exporting data". The bottom-right pane shows the "Data" view with a "Number of decimals" set to 3.



Successful Importing

In the bottom right window, it is possible to have a quick look at the categorized variables, the numerical variables or the data.

Index	ID	More time	Going out	NewsPaper	TV with
1	1		Going out:p...	everyday	TV with:so...
2	2	rest	Going out:a...	everyday	TV with:alone

Quick look at categorized variables

Quick look at numerical variables

To see data



First insight into the data

LEISURE.Sheet1

Diagram - x

LEISURE.Sheet1

Executions Logs Data

Number of rows [5004] Number of columns [16] Number of decimals 3

Index	ID	More time	Going out	NewsPaper	TV with	Channel-01	Channel-02	TPTVH	How many books	How many CS	ComicStripsIncluded?	Gender	Income	Age	Education	CSP42
1	1	NoLackFreeTime	Going out:partner	everyday	TV with:so...	TF1	France3	15	6	20	no	male	3050-3809€	25	Bac-BP-BT	53-Employé de C...
2	2	rest	Going out:alone	everyday	TV with:alone	17	17	49	20	0	yes	male	NA	68	CEP	78AOuvrier
3	3	home DIY	Going out:partner	<once/week	TV with:dep...	TF1	M6	81	5	1	no	female	1905-2289€	26	DEUG-DU...	43-ProfInterm
4	4	develop knowledge	Going out:friends	<once/week	TV with:dep...	M6	TF1	14	20	20	no	male	915-1219€	19	Bac-BP-BT	55EmployéCom...
5	5	home DIY	Going out:group	everyday	TV with:so...	zapping		19	3	10	no	male	2290-3049€	71	CEP	75-Aprofint
6	6	rest	Going out:friends	<once/week	TV with:dep...	Arte	Canal+	12	3	2	no	female	2290-3049€	64	BEPC	74-Acadre
7	7	home DIY	DontGoOut	everyday	TV with:dep...	TF1	France2	30				female	1220-1524€	77	CEP	71-A.agriculteur
8	8	take care of family	Going out:family	<once/week	TV with:dep...	TF1	France2	11	10	0	no	female	915-1219€	32	CAP-BEP	56-Service
9	9	develop knowledge	Going out:partner	>once/week	TV with:so...	Arte	M6	12	24	0	no	female	3810-6099€	41	MasterDes...	38-Ingénieur
10	10	NoLackFreeTime	Going out:group	never	TV with:alone	France3	17	24	50	0	no	female	1525-1904€	67	aucun	77-Aemployé
11	11	NoLackFreeTime	Going out:family	once/week	TV with:alone	TF1	France5	42	100	0	yes	female	2290-3049€	84	Bac-BP-BT	52-EmplyéFctPub...
12	12	physical activity	DontGoOut	never	TV with:alone	France3	TF1	10	3	4	no	male	915-1219€	29	CAP-BEP	67ONQIndustrie...
13	13	NoLackFreeTime	DontGoOut	never	TV with:alone	TF1	France2	35	100	0	no	female	915-1219€	83	aucun	71-A.agriculteur
14	14	physical activity	Going out:partner	>once/week	TV with:so...	TF1	M6	30	0	3	no	female	1220-1524€	58	CEP	77-Aemployé
15	15	take care of family	DontGoOut	once/week	TV with:alone	TF1	M6	14	100	60	yes	female	1905-2289€	45	Bac-BP-BT	54-EmployéAdm
16	16	develop knowledge	DontGoOut	once/week	TV with:so...	France2	Arte	18	20	0	no	female	1525-1904€	74	CEP	77-Aemployé
17	17	develop knowledge	Going out:family	<once/week	TV with:so...	M6	zapping	15				female	3050-3809€	27	MasterDes...	54-EmployéAdm

In the bottom right window click on the *Data* tab and you will see the data. By default, this first icon is active.



First insight into the data

LEISURE.Sheet1

Diagram

By clicking on the second icon, you will see a summary of the numerical variables (min, max, mean, std dev....). Note the number of missing.

LEISURE.Sheet1

Executions Logs Data

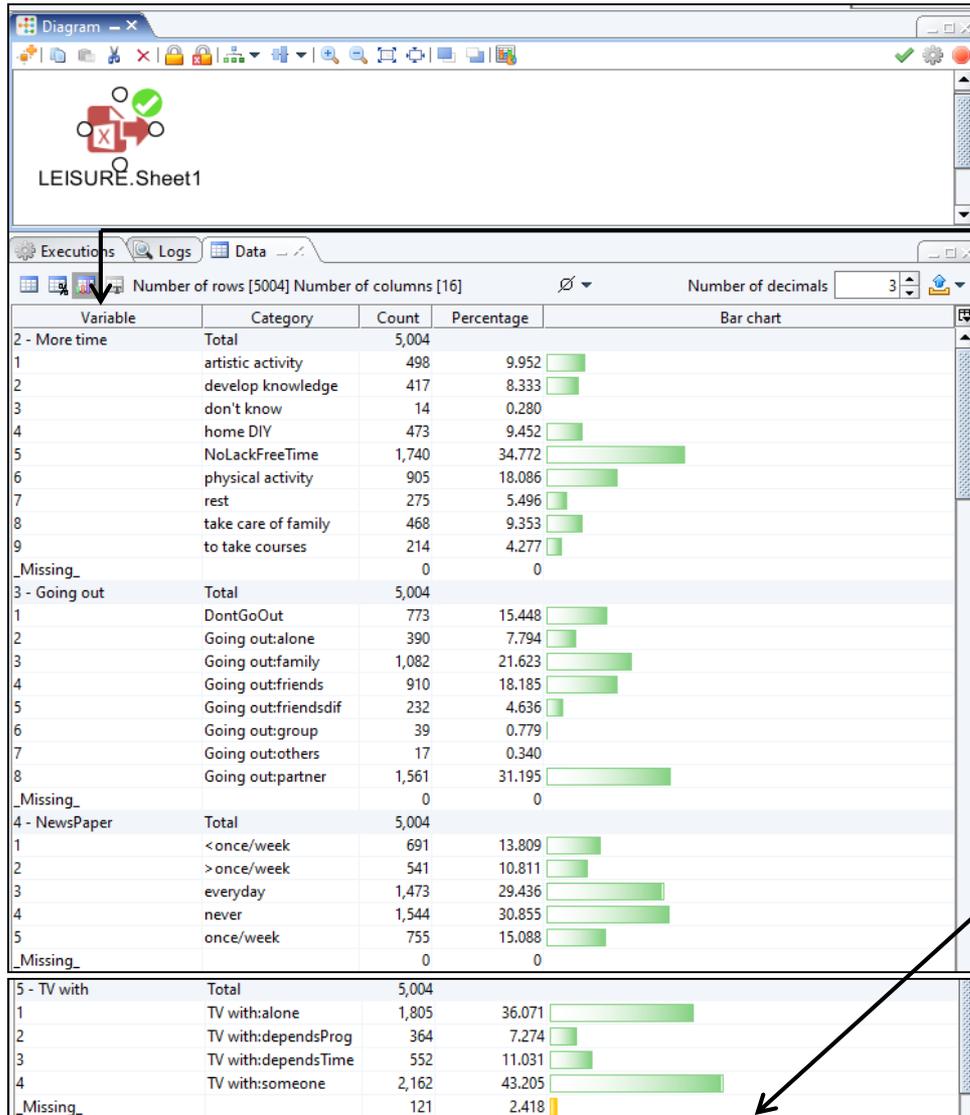
Number of rows [5004] Number of columns [16]

Index	Variable	Storage	Role	Number of distinct	Number of _Missing_	Minimum	Maximum	Mean	Standard dev...	Sum
1	ID	String	id		0					
2	More time	String		9	0					
3	Going out	String		8	0					
4	NewsPaper	String		5	0					
5	TV with	String		4	121					
6	Channel-01	String		16	121					
7	Channel-02	String		16	786					
8	TPTVH	Integer			127	0	168	20.712	14.958	101,010
9	How many books	Integer			1,076	0	999	26.839	109.143	105,423
10	How many CS	Integer			1,076	0	999	8.204	58.722	32,225
11	ComicStripsIncluded?	String		2	1,076					
12	Gender	String		2	0					
13	Income	String		10	0					
14	Age	Integer			0	15	95	46.331	19.019	231,838
15	Education	String		9	415					
16	CSP42	String		35	608					



LEISURE.Sheet1

First insight into the data



By clicking on the third icon, you will see frequency tables and bar charts of the categorized variables.

Note: you can see that the categories are not ordered (e.g., Newspaper); you can also see numbers and percentages of missing (yellow bar).

What we are going to do

Next steps:

- Managing missing data
- Grouping categories
- Binning and creating categories for numerical variables
- Discarding individuals with too many missing data.



Missing data management

Missing data management

The screenshot shows the SPAD 9.1 interface for project LEISURE2019. The main diagram window contains an Excel icon labeled 'Leisure2019.DATA' and a 'Missing data management' icon. A dashed arrow points from the Excel icon to the 'Missing data management' icon. The 'Methods' window on the left shows a tree view with 'Missing data management' selected under 'Columns - Variables'. The 'Executions list' window at the bottom shows a table with the following data:

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	Leisure2019.DATA		✓ Completed (Ok)			5004 18:15 (07/08/2019)	00:00,359	
1	Missing data management		Not started					

In the Methods window select **Data Management**, then **Columns - Variables** and **Missing_data_management**. Drag the **Missing_data_management** icon in the Diagram window and drop it on the **Excel sheet icon**. Right click to define parameters of the method.



Missing data management

Missing data management

Missing data management

Replacement method

Manual EM algorithm (continuous)

Available variables

Index	Name	Storage	Role	Missing values	Method	Number of Missing	Number of Categories	Min	Max	Mean	Standard deviation	Sum
1	ID	String	id			0						
2	More time	String				0	9					
3	Going out	String				0	8					
4	NewsPaper	String				0	5					
5	TV with	String				121	4					
6	Channel-01	String				121	16					
7	Channel-02	String				786	16					
8	TPTVH	Integer				127		0	168	20.712	14.958	101,010
9	How many books	Integer				1076		0	999	26.839	109.143	105,423
10	How many CS	Integer				1076		0	999	8.204	58.722	32,225
11	ComicStripsIncluded?	String				1076	2					
12	Gender	String				0	2					
13	Income	String				0	10					
14	Age	Integer				0		15	95	46.331	19,019	231,838
15	Education	String				415	9					
16	CSP42	String				608	35					

Variables Parameters

Ok Cancel

In the Method column the cells corresponding to variables with missing data are colored.



Missing data management

Missing data management

Missing data management

Replacement method
 Manual EM algorithm (continuous)

Available variables

Index	Name	Storage	Role	Missing values	Method	Number of Missing	Number of Categories	Min	Max	Mean	Standard deviation	Sum
1	ID	String	id			0						
2	More time	String				0	9					
3	Going out	String				0	8					
4	NewsPaper	String				0	5					
5	TV with	String			Constant : 0	121	4					
6	Channel-01	String			Constant : 0	121	16					
7	Channel-02	String			Constant : 0	786	16					
8	TPTVH	Integer			Constant : 0	127		0	168	20.712	14.958	101,010
9	How many books	Integer			Constant : 0	1076		0	999	26.839	109.143	105,423
10	How many CS	Integer			Constant : 0	1076		0	999	8.204	58.722	32,225
11	ComicStripsIncluded?	String			Constant : 0	1076	2					
12	Gender	String				0	2					
13	Income	String				0	10					
14	Age	Integer				0		15	95	46.331	19.019	231,838
15	Education	String			Constant : 0	415	9					
16	CSP42	String			Constant : 0	608	35					

Variables Parameters

Ok Cancel

Double click on cell and write 0. When all cells filled **click OK**.



Logical filter

Logical filter

The screenshot shows the SPAD 9.1 software interface. The main window displays a process diagram with three steps: 'LEISURE.Sheet1' (represented by an Excel icon), 'Missing data management' (represented by a circle with a checkmark and a cross), and 'Logical filter' (represented by a circle with a checkmark and a play button). The 'Logical filter' icon is highlighted. The 'Methods' window on the left shows a tree structure with 'Data Management' expanded to 'Rows - Cases', where 'Logical filter' is selected.

We are going to exclude individuals who are less than 18 years old **or** those who have missing data for **TV with or How many books and How many comic strips** questions.

In the Methods window select *Data Management*, then *Rows – Cases* and *Logical filter*. Drag the *Logical filter* icon and drop it in Diagram window on the *Missing data management* icon. Then right click to define parameters.



Logical filter

Logical filter

Logical filter

Selection method Include Exclude

Index	Name	Storage	Role	Values \ Variable \
1	ID	String	id	
2	More time	String		
3	Going out	String		
4	NewsPaper	String		
5	TV with	String		
6	Channel-01	String		
7	Channel-02	String		
8	TPTVH	Integer		
9	How many books	Integer		
10	How many CS	Integer		
11	ComicStripsIncluded?	String		
12	Gender	String		
13	Income	String		
14	Age	Integer		
15	Education	String		
16	CSP42	String		

AND OR Validate

(...)

Link	Condition
------	-----------

Remove the categories with zero count

Ok Cancel

The first and very important thing to verify is the selection method.

Here we will choose **Exclude**.



Logical filter

Logical filter

Logical filter

Selection method Include Exclude

Index	Name	Storage	Role	Values	Variable
1	ID	String	id	=	
2	More time	String		<>	
3	Going out	String		<	
4	NewsPaper	String		<=	
5	TV with	String		>	
6	Channel-01	String		>=	
7	Channel-02	String		= ∅	
8	TPTVH	Integer		<> ∅	
9	How many books	Integer			Mean : 46.331
10	How many CS	Integer			Minimum : 15
11	ComicStripsIncluded?	String			Maximum : 95
12	Gender	String			Value : 18
13	Income	String			
14	Age	Integer			
15	Education	String			
16	CSP42	String			

Number of _Missing_ : 0

AND OR

Link	Condition
	Age < 18.0

Remove the categories with zero count

Click on **Age** variable in the left window. Then select **<** in the central column and write **18** in the Value window. Then click on **OR** and **Validate**.

Age < 18.0 appears in the bottom window.



Logical filter

Logical filter

Logical filter

Selection method Include Exclude

Index	Name	Storage	Role
1	ID	String	id
2	More time	String	
3	Going out	String	
4	NewsPaper	String	
5	TV with	String	
6	Channel-01	String	
7	Channel-02	String	
8	TPTVH	Integer	
9	How many books	Integer	
10	How many CS	Integer	
11	ComicStripsIncluded?	String	
12	Gender	String	
13	Income	String	
14	Age	Integer	
15	Education	String	
16	CSP42	String	

Values	Variable	Index	Value	Count
		1	TV with:alone	1,805
=		2	TV with:dependsProg	364
<>		3	TV with:dependsTime	552
<		4	TV with:someone	2,162
<=		5	0	121
>				
>=				
= ∅				
<> ∅				

Number of _Missing_ : 0

AND OR

Link	Condition
	Age < 18.0
or	TV with = 0

Remove the categories with zero count

Click on **TV with** variable in the left window.

Then select = in the central column and select 0 in the Value column (right window).

Then click on Validate.

TV with = 0 appears in the bottom window.



Logical filter

Logical filter

Logical filter

Selection method Include Exclude

Index	Name	Storage	Role
1	ID	String	id
2	More time	String	
3	Going out	String	
4	NewsPaper	String	
5	TV with	String	
6	Channel-01	String	
7	Channel-02	String	
8	TPTVH	Integer	
9	How many books	Integer	
10	How many CS	Integer	
11	ComicStripsIncluded?	String	
12	Gender	String	
13	Income	String	
14	Age	Integer	
15	Education	String	
16	CSP42	String	

Values \ Variable \

=

<>

<

<=

>

>=

= ∅

<> ∅

Mean : 21.068
Minimum : 0
Maximum : 999

Value : 999

Number of _Missing_ : 0

AND OR

Link	Condition
	Age < 18.0
or	TV with = 0
or	How many books = 999.0

Remove the categories with zero count

Click on **How many books** variable in the left window. Then select = in the central column and write 999 in the Value window.

Then click on Validate.

How many books = 999.0 appears in the bottom window.



Logical filter

Logical filter

Logical filter

Selection method Include Exclude

Index	Name	Storage	Role
1	ID	String	id
2	More time	String	
3	Going out	String	
4	NewsPaper	String	
5	TV with	String	
6	Channel-01	String	
7	Channel-02	String	
8	TPTVH	Integer	
9	How many books	Integer	
10	How many CS	Integer	
11	ComicStripsIncluded?	String	
12	Gender	String	
13	Income	String	
14	Age	Integer	
15	Education	String	
16	CSP42	String	

Values \ Variable \

=

<>

<

<=

>

>=

= ∅

<> ∅

Mean : 6.440
Minimum : 0
Maximum : 999

Value: 999

Number of _Missing_ : 0

AND OR Validate

Link	Condition
	Age < 18.0
or	TV with = 0
or	How many books = 999.0
and	How many CS = 999.0

Remove the categories with zero count

Ok Cancel

Click on **How many CS** variable in the left window. Then select = in the central column and write 999 in the Value window.

Then click on AND and Validate.

How many CS = 999.0 appears in the bottom window.

All conditions being met, **click on OK**



Logical filter

Logical filter

If the method is well executed, you must have 4665 individuals left. You may have a green icon on the top right side of **Logical filter** icon but with another number of individuals left. This means that there are mistakes in the logical condition. In this case you must return to Parameters of the method and see what is wrong.

Executions Logs Data

Number of rows [4665] Number of columns [17] Number of decimals 3

ng out	NewsPaper	TV with	Channel-01	Channel-02	TPTVH	How many ...	How many ...	ComicStrips...	Gender	Income	Age	Education	CSP42	Channel01+
out:p... everyday	TV with:so...	TF1	France3	15	6	20	no	male	3050-3809€	25	Bac-BP-BT	53-Employé...	TF1	
out:a... everyday	TV with:alone	17	17	49	20	0	yes	male	NA	68	CEP	78AChuvrier	17	
out:p... <once/week	TV with:dep...	TF1	M6	81	5	1	no	female	1905-2289€	26	DEUG-DUT...	43-ProfInter...	TF1	



The screenshot shows the SPAD 9.1 interface for a project named 'LEISURE2019'. The main window displays a process diagram with four steps: 'LEISURE.Sheet1' (Excel icon), 'Missing data management' (circular icon with a checkmark), 'Logical filter' (circular icon with 'IF' and a checkmark), and 'Binnings...' (circular icon with a play button). A red arrow points from the 'Binnings...' icon in the diagram to the 'Binning - Grouping' method in the 'Methods' window. The 'Methods' window is open to 'Data Management' > 'Columns - Variables' > 'Binning - Grouping'. A text box on the right provides instructions on how to use this method.

We have to define classes for the 2 variables : **Age** and **TVTTPH**. We have also to group some categories for the variable **Going out**.

To do that select in the Methods window *Data Management*, then *Columns-Variables* and *Binning-Grouping*. Drag the *Binning-Grouping* icon and drop it on the *Logical filter* icon in the Diagram window.



Binnings...

Grouping Going out

Binning, category grouping

Available variables (19)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	Going out	String		8	<input checked="" type="checkbox"/>
4	NewsPaper	String		5	<input checked="" type="checkbox"/>
5	TV with	String		5	<input checked="" type="checkbox"/>
6	Channel-01	String		17	<input checked="" type="checkbox"/>
7	Channel-02	String		17	<input checked="" type="checkbox"/>
8	TPTVH	Integer			<input checked="" type="checkbox"/>
9	How many books	Integer			<input checked="" type="checkbox"/>
10	How many CS	Integer			<input checked="" type="checkbox"/>
11	ComicStripsIncluded?	String		3	<input checked="" type="checkbox"/>
12	Gender	String		2	<input checked="" type="checkbox"/>
13	Income	String		10	<input checked="" type="checkbox"/>
14	Age	Integer			<input checked="" type="checkbox"/>
15	Education	String		10	<input checked="" type="checkbox"/>
16	CSP42	String		36	<input checked="" type="checkbox"/>
17	Channel01+02	String		17	<input checked="" type="checkbox"/>
18	NbCS	Integer			<input checked="" type="checkbox"/>
19	Reading	Float			<input checked="" type="checkbox"/>

Recorded variables (3)

Index	Name	Storage
1	Rec_Age	String
2	Rec_TPTVH	String
3	Rec_Reading	String

Binning

- Automatic binning
- Binning with a reference variable
- Dynamic binning
- Center-reduce
- Rank transformation
- Category grouping**
- Categorical into continuous

Input variable

- Age
- TPTVH
- Reading

Ok Cancel

Now we want to group categories for **Going out** variable.
Right click on **Going out** variable and choose *Category grouping*.



Binnings...

Grouping Going out

Category grouping

Created variable(s)

Name Storage

Value	New value	Count / %
DontGoOut		15.927 %
Going out:alone		7.910 %
Going out:family		22.015 %
Going out:friends		16.334 %
Going out:friendsdif		4.309 %
Going out:group		0.772 %
Going out:others		0.322 %
Going out:partner		32.412 %

Number of _Missing_ (0)

Missing values processing

No change
 Recoded into

Other values processing

Transformed into missing values
 Each new value becomes a new category
 Grouped in

OK Cancel

A new window is opened. In the left part you can see all categories of the variable. You can also see 3 kinds of blue arrows :

-  to group categories
-  to keep categories
-  to go back



Grouping Going out

Category grouping

Created variable(s) Name: Rec_Going out Storage: String

Value	New value	Count / %
DontGoOut	DontGoOut	15.927 %
Going out:alone	Going out:alone	7.910 %
Going out:family	Going out:family	22.015 %
Going out:friends	Going out:friends	16.334 %
Going out:friendsdif	Going out:friendsdif	4.309 %
Going out:group	Going out:friendsdif	0.772 %
Going out:others	Going out:friendsdif	0.322 %
Going out:partner	Going out:partner	32.412 %

Number of _Missing_ (0)

Missing values processing: No change

Other values processing: Transformed into missing values

Order	New value	Values	Count / %
1	DontGoOut	DontGoOut	15.927 %
2	Going out:alone	Going out:alone	7.910 %
3	Going out:family	Going out:family	22.015 %
4	Going out:friends	Going out:friends	16.334 %
5	Going out:friendsdif	Going out:friendsdif Going out:group Going out:others	5.402 %
6	Going out:partner	Going out:partner	32.412 %

OK Cancel

The 3 categories with weak % (<5) will be grouped.

Transfer the first four categories from left to right with Group the next three categories with Finally transfer the last category with **Click OK.**



Binnings...

Grouping Going out

Binning, category grouping

Available variables (16)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	Going out	String		8	<input checked="" type="checkbox"/>
4	NewsPaper	String		5	<input checked="" type="checkbox"/>
5	TV with	String		5	<input checked="" type="checkbox"/>
6	Channel-01	String		17	<input checked="" type="checkbox"/>
7	Channel-02	String		17	<input checked="" type="checkbox"/>
8	TPTVH	Integer			<input checked="" type="checkbox"/>
9	How many books	Integer			<input checked="" type="checkbox"/>
10	How many CS	Integer			<input checked="" type="checkbox"/>
11	ComicStripsIncluded?	String		3	<input checked="" type="checkbox"/>
12	Gender	String		2	<input checked="" type="checkbox"/>
13	Income	String		10	<input checked="" type="checkbox"/>
14	Age	Integer			<input checked="" type="checkbox"/>

Recorded variables (1)

Index	Name	Storage	Role	Method	Input variable
1	Rec_Going out	String		Category grouping	Going out

Ok Cancel

Back to the general window of **Binning-Grouping**. See now the recorded variable in the bottom window.

If you want to modify the grouping or anything else, just right click on the line and choose **Edit**.



Binnings...

Binning Age

Binning, category grouping

Available variables (19)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	Going out	String		8	<input checked="" type="checkbox"/>
4	NewsPaper	String		5	<input checked="" type="checkbox"/>
5	TV with	String		5	<input checked="" type="checkbox"/>
6	Channel-01	String		17	<input checked="" type="checkbox"/>
7	Channel-02	String		17	<input checked="" type="checkbox"/>
8	TPTVH	Integer			<input checked="" type="checkbox"/>
9	How many books	Integer			<input checked="" type="checkbox"/>
10	How many CS	Integer			<input checked="" type="checkbox"/>
11	ComicStripsIncluded?	String		3	<input checked="" type="checkbox"/>
12	Gender	String		2	<input checked="" type="checkbox"/>
13	Income	String		10	<input checked="" type="checkbox"/>
14	Age	Integer			<input checked="" type="checkbox"/>
15	Education	String		10	<input checked="" type="checkbox"/>
16	CSP42	String		36	<input checked="" type="checkbox"/>
17	Channel01+02	String		17	<input checked="" type="checkbox"/>
18	NbCS	Integer		39	<input checked="" type="checkbox"/>
19	Reading	Float			<input checked="" type="checkbox"/>

Recorded variables (0)

Index	Name	Storage
-------	------	---------

Binning

- Automatic binning
- Binning with a reference variable
- Dynamic binning
- Center-reduce
- Rank transformation

Input variable

Ok Cancel

Right click on **Age** :
a little window opens.
Choose the wanted
action : here **Binning**
Click **Binning**.



Binnings...

Binning Age

Binning of continuous variables

Binning method

Equal width Equal frequencies Manual bounds Manual percentages

List of upper bounds excluded separated by "/". Example 19/26/36/46/56/66/100

18/25/35/45/55/65

Parameters

Number of bins

Width

Minimum limit (included) Automatic Imposed

Maximum limit (excluded) Automatic Imposed

Use a weight variable

Specific parameters

Special value assigned to a supplementary bin Value Bin

Missing data put in an extra bin Bin

Labels format

New variables labels extension Prefix Suffix

Prefix the categories with the first characters of the variables label Number of characters

Created bin labels Generated by thresholds Numbered

Generate the bounds of the bins at the first execution

Data Management and bins calculation **completed**

Ok Cancel

In this new window :
click on ***Manual bounds***.
Write the bounds in the
window below . Here the
bounds are :

18/25/35/45/55/65

Then click OK.

Note: to define bounds you
must have studied the **Age**
distribution before.

Equal frequencies option is
not recommended.



Binnings...

Binning Age

Binning

Use the X first characters of the variables names as generic title of the categories. X:

Bin labels:

Allow gaps between the bounds of the bins

Weight variable:

Descriptive statistics

Min[18]	Number[4665]	Mean[47.780]
Max[95]	Number of _Missing_[0]	Standard deviation[18.300]

Column Count:

Index	Bin	>=	<	Count / %
1	< 18	-∞	18	0.000
2	[18;25[	18	25	507.000
3	[25;35[	25	35	812.000
4	[35;45[	35	45	896.000
5	[45;55[	45	55	730.000
6	[55;65[	55	65	748.000
7	>= 65	65	∞	972.000

Specific parameters

Special value assigned to a supplementary bin Value: Bin:

Missing data put in an extra bin Bin:

Name of the new variable:

In this new window you can see the bounds you gave and the name of the new variable.

By clicking on the little green arrows you can see counts or percentages for each class. Clicking on **Count/%** will display alternatively counts or percentages. **Click OK.**

Note: the count for < 18 is 0. This is a logical result as far as the individuals less than 18 have been removed.



Binnings...

Binning Age

Binning, category grouping

Available variables (16)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	Going out	String		8	<input checked="" type="checkbox"/>
4	NewsPaper	String		5	<input checked="" type="checkbox"/>
5	TV with	String		5	<input checked="" type="checkbox"/>
6	Channel-01	String		17	<input checked="" type="checkbox"/>
7	Channel-02	String		17	<input checked="" type="checkbox"/>
8	TPTVH	Integer			<input checked="" type="checkbox"/>
9	How many books	Integer	Categorical		<input checked="" type="checkbox"/>
10	How many CS	Integer			<input checked="" type="checkbox"/>
11	ComicStripsIncluded?	String		3	<input checked="" type="checkbox"/>
12	Gender	String		2	<input checked="" type="checkbox"/>
13	Income	String		10	<input checked="" type="checkbox"/>
14	Age	Integer			<input checked="" type="checkbox"/>

Recorded variables (2)

Index	Name	Storage	Role	Method	Input variable
1	Rec_Going out	String		Category grouping	Going out
2	Rec_Age	String		Binning	Age

Ok Cancel

Back to the general window of *Binning-Grouping*. See now the recoded variable in the bottom window.

If you want to change bounds or anything else, just right click on the line and choose *Edit*.



Binnings...

Binning TVTPH

Now we have to do the same thing with **TVTPH** variable. Right click on **TVTPH** variable. Choose *Binning*.

Binning, category grouping

Available variables (19)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	Going out	String		8	<input checked="" type="checkbox"/>
4	NewsPaper	String		5	<input checked="" type="checkbox"/>
5	TV with	String		5	<input checked="" type="checkbox"/>
6	Channel-01	String		17	<input checked="" type="checkbox"/>
7	Channel-02	String		17	<input checked="" type="checkbox"/>
8	TPTVH	Integer			<input checked="" type="checkbox"/>
9	How many books	Integer			<input checked="" type="checkbox"/>
10	How many CS	Integer			<input checked="" type="checkbox"/>
11	ComicStripsIncluded?	String		3	<input checked="" type="checkbox"/>
12	Gender	String		2	<input checked="" type="checkbox"/>
13	Income	String		10	<input checked="" type="checkbox"/>
14	Age	Integer			<input checked="" type="checkbox"/>
15	Education	String			<input checked="" type="checkbox"/>
16	CSP42	String		36	<input checked="" type="checkbox"/>
17	Channel01+02	String		17	<input checked="" type="checkbox"/>
18	NbCS	Integer		39	<input checked="" type="checkbox"/>
19	Reading	Float			<input checked="" type="checkbox"/>

Recoded variables (1)

Index	Name	Storage	Role	Method	Input variable
1	Rec_Age	String		Binning	Age

Ok Cancel



Binnings...

Binning TVTPH

Binning of continuous variables

Binning method

Equal width Equal frequencies Manual bounds Manual percentages

List of upper bonds excluded separated by "/". Example 19/26/36/46/56/66/100

5/10/20/35

Parameters

Number of bins

Width

Minimum limit (included) Automatic Imposed

Maximum limit (excluded) Automatic Imposed

Use a weight variable

Specific parameters

Special value assigned to a supplementary bin Value Bin

Missing data put in an extra bin Bin

Labels format

New variables labels extension Prefix Suffix

Prefix the categories with the first characters of the variables label Number of characters

Created bin labels Generated by thresholds Numbered

Generate the bounds of the bins at the first execution

Data Management and bins calculation **completed**

Ok Cancel ?

Don't forget to click ***Manual bounds***.

Bounds are : 5/10/20/35

Click OK.

Note: to define bounds you must have studied the **TVTPH** distribution before.



Binnings...

Binning TVTPH

Binning

Use the X first characters of the variables names as generic title of the categories. X:

Bin labels

Allow gaps between the bounds of the bins

Weight variable

Descriptive statistics

Min[0]	Number[4665]	Mean[20.937]
Max[168]	Number of _Missing_[0]	Standard deviation[15.064]

Column Count

Index	Bin	>=	<	Count / %
1	< 5	-∞	5	255.000
2	[5;10[	5	10	626.000
3	[10;20[	10	20	1,774.000
4	[20;35[	20	35	1,344.000
5	>= 35	35	∞	666.000

Specific parameters

Special value assigned to a supplementary bin Value Bin

Missing data put in an extra bin Bin

Name of the new variable

Now you can see:

- the bounds you gave
- counts and percentages
- name of the new variable.

Click OK.



Binnings...

Binning TVTPH

Binning, category grouping

Available variables (16)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	Going out	String		8	<input type="checkbox"/>
4	NewsPaper	String		5	<input checked="" type="checkbox"/>
5	TV with	String		5	<input checked="" type="checkbox"/>
6	Channel-01	String		17	<input checked="" type="checkbox"/>
7	Channel-02	String		17	<input checked="" type="checkbox"/>
8	TPTVH	Integer			<input type="checkbox"/>
9	How many books	Integer			<input checked="" type="checkbox"/>
10	How many CS	Integer			<input checked="" type="checkbox"/>
11	ComicStripsIncluded?	String		3	<input checked="" type="checkbox"/>
12	Gender	String		2	<input checked="" type="checkbox"/>
13	Income	String		10	<input checked="" type="checkbox"/>
14	Age	Integer			<input type="checkbox"/>
15	Education	String		10	<input checked="" type="checkbox"/>
16	CSP42	String		36	<input checked="" type="checkbox"/>

Recoded variables (3)

Index	Name	Storage	Role	Method	Input variable
1	Rec_Going out	String		Category grouping	Going out
2	Rec_Age	String		Binning	Age
3	Rec_TPTVH	String		Binning	TPTVH

Ok Cancel

Back to the general window of *Binning-Grouping*. See now recoded variables in the bottom window. As we have defined new variables we need no more the old ones. We can uncheck the three variables : **Going out, Age and TPTVH.**

If you want to change bounds or anything else, just right click on the line and choose *Edit*. Otherwise **click OK.**



New variables generator

Creating new variables : TV and Reading

The screenshot shows the SPAD 9.1 interface for the LEISURE2019 project. The main window displays a process diagram with the following steps: LEISURE.Sheet1, Missing data management, Logical filter, Binnings..., and New variables generator. The 'New variables generator' icon is highlighted with a red box. The 'Methods' window is open, showing a tree view of data management methods, with 'New variables generator' selected. A text box on the right provides instructions on how to use the 'New variables generator'.

We are going to create new variables : one for TV (type of channel preferred), the other for reading (number of books and CS).
In the Methods window select **Data Management**, then **Columns - Variables** and **New variables generator**.
Drag the **New variables generator** icon and drop it in Diagram window on the **Binnings...** icon. Then right click to define parameters.



New variables generator

Name	Storage	Role	Keep	Value
ID	String	id	<input checked="" type="checkbox"/>	1
More time	String		<input checked="" type="checkbox"/>	NoLackFreeTime
Going out	String		<input checked="" type="checkbox"/>	Going out:partner
NewsPaper	String		<input checked="" type="checkbox"/>	everyday
TV with	String		<input checked="" type="checkbox"/>	TV with:someone
Channel-01	String		<input checked="" type="checkbox"/>	TF1
Channel-02	String		<input checked="" type="checkbox"/>	France3
TPTVH	Integer		<input checked="" type="checkbox"/>	15
How many books	Integer		<input checked="" type="checkbox"/>	6
How many CS	Integer		<input checked="" type="checkbox"/>	20
ComicStripsIncluded?	String		<input checked="" type="checkbox"/>	no
Gender	String		<input checked="" type="checkbox"/>	male
Income	String		<input checked="" type="checkbox"/>	3050-3809€
Age	Integer		<input checked="" type="checkbox"/>	25
Education	String		<input checked="" type="checkbox"/>	Bac-BP-BT
CSP42	String		<input checked="" type="checkbox"/>	53-Employé de Commerce

Function	Parameters	Values	Results
----------	------------	--------	---------

First choice

Second choice

Creating TV variable

Here is the principle. People were asked to tell the channel they prefer to watch. They had to give a first choice and a second choice. We will take into account the first choice if it is one of the seven DTT channels, otherwise we will consider the second choice.

This could be expressed like : if the first choice (Channel-01) is one of the 7 DTT channels, keep it, if not take Channel-02.



New variables generator

Creating TV variable

Click on *Tools* and then on *Logical assistant*.

Assistant logique([all])

Name	Storage	Role	Keep	Value
ID	String	id	<input checked="" type="checkbox"/>	1
More time	String		<input checked="" type="checkbox"/>	NoLackFreeTime
Going out	String		<input checked="" type="checkbox"/>	Going out:partner
NewsPaper	String		<input checked="" type="checkbox"/>	everyday
TV with	String		<input checked="" type="checkbox"/>	TV with:someone
Channel-01	String		<input checked="" type="checkbox"/>	TF1
Channel-02	String		<input checked="" type="checkbox"/>	France3
TPTVH	Integer		<input checked="" type="checkbox"/>	15
How many books	Integer		<input checked="" type="checkbox"/>	6
How many CS	Integer		<input checked="" type="checkbox"/>	20
ComicstripsIncluded?	String		<input checked="" type="checkbox"/>	no
Gender	String		<input checked="" type="checkbox"/>	male
Income	String		<input checked="" type="checkbox"/>	3050-3809€
Age	Integer		<input checked="" type="checkbox"/>	25
Education	String		<input checked="" type="checkbox"/>	Bac-BP-BT
CSP42	String		<input checked="" type="checkbox"/>	53-Employé de Commerce

Logical wizard
This logical wizard is the equivalent of the function `_IF_(Condition, Value if True, Value if False)`.
It allows to specify many conditions. The user specifies the values to return when the condition evaluates to true or not.

Function	Parameters	Values	Results
----------	------------	--------	---------

Sort the categories automatically by their natural order Results : variable as prefix

Ok Cancel



New variables generator

New variables generator

Functions

- Conversion
- Date & Time
- Inspection
- Logical
- Math and Trigo
- Memory
- Statistical
- Statistical tests
- String
- Text
- Tools
 - Calculator
 - Logical assistant
 - Logical assistant (case)
 - Python script

Input and created variables

Name	Storage	Role	Keep	Value
ID	String	id	<input checked="" type="checkbox"/>	1
More time	String		<input checked="" type="checkbox"/>	NoLackFreeTime
Going out	String		<input checked="" type="checkbox"/>	Going out:partner
NewsPaper	String		<input checked="" type="checkbox"/>	everyday
TV with	String		<input checked="" type="checkbox"/>	TV with:someone
Channel-01	String		<input checked="" type="checkbox"/>	TF1
Channel-02	String		<input checked="" type="checkbox"/>	France3
TPTVH	Integer		<input checked="" type="checkbox"/>	15
How many books	Integer		<input checked="" type="checkbox"/>	6
How many CS	Integer		<input checked="" type="checkbox"/>	20
ComicStripsIncluded?	String		<input checked="" type="checkbox"/>	no
Gender	String		<input checked="" type="checkbox"/>	male
Income	String		<input checked="" type="checkbox"/>	3050-3809€
Age	Integer		<input checked="" type="checkbox"/>	25
Education	String		<input checked="" type="checkbox"/>	Bac-BP-BT
CSP42	String		<input checked="" type="checkbox"/>	53-Employé de Commerce
If	String		<input checked="" type="checkbox"/>	

Assistant logique([all])

Row 1 Test

Logical wizard
This logical wizard is the equivalent of the function `_IF_(Condition, Value if True, Value if False)`. It allows to specify many conditions conditions. The user specifies the values to return wheter the condition evaluates to true or not.

Successive transformations

Function	Parameters	Values	Results
Logical assistant	Filter	Double-click	Net : If

Sort the categories automatically by their natural order Results : variable as prefix

Ok Cancel

Creating TV variable

Double click on *Logical assistant*. In the bottom window you can see a line with *Logical assistant*. Then double click where it is indicated to double click in the *Values* column.



New variables generator

Creating TV variable

Logical assistant

Index	Name	Storage	Role
1	ID	String	id
2	More time	String	
3	Going out	String	
4	NewsPaper	String	
5	TV with	String	
6	Channel-01	String	
7	Channel-02	String	
8	TPTVH	Integer	
9	How many books	Integer	
10	How many CS	Integer	
11	ComicStripsIncluded?	String	
12	Gender	String	
13	Income	String	
14	Age	Integer	
15	Education	String	
16	CSP42	String	

Values \ Variable \

Index	Value	Count
=		
<>		
<		
<=		
>		
>=		
= ∅		
<> ∅		

Number of _Missing_: 0

AND OR

(...)

Link	Condition
------	-----------

Results

Type: String

If true: Constant true Variable ID _Missing_

If false: Constant false Variable ID _Missing_

The variables list appears.
Click on Channel-01
variable.



New variables generator

Creating TV variable

Logical assistant

Index	Name	Storage	Role
1	ID	String	id
2	More time	String	
3	Going out	String	
4	NewsPaper	String	
5	TV with	String	
6	Channel-01	String	
7	Channel-02	String	
8	TPTVH	Integer	
9	How many books	Integer	
10	How many CS	Integer	
11	ComicStripsIncluded?	String	
12	Gender	String	
13	Income	String	
14	Age	Integer	
15	Education	String	
16	CSP42	String	

Values \ Variable \

Index	Value	Count
4	14	29
5	15	24
6	16	40
7	17	89
8	19	17
9	Arte	259
10	Canal+	251
11	France2	613
12	France3	416
13	France5	200
14	M6	546
15	TF1	1,408
16	zapping	628
17		0

Number of _Missing_: 0

AND OR

Link Condition

Channel-01 = Arte or Canal+ or France2 or France3 or France5 or M6 or TF1 or zapping

Results

Type

If true Constant Variable _Missing_

If false Constant Variable _Missing_

All the categories of this variable appear in the right window.

Select = in the central column. Select the 7 channels and zapping (number 9 to number 16) and click on OR and Validate.

You can see in the bottom window the condition. Finally don't forget to define in the **Results** window the type of the variable and the value when the condition is true (Channel-01) and when the condition is false (Channel-02).

Then **click OK**.



New variables generator

Assistant logique([all])

Name	Storage	Role	Keep	Value
ID	String	id	<input checked="" type="checkbox"/>	1
More time	String		<input checked="" type="checkbox"/>	NoLackFreeTime
Going out	String		<input checked="" type="checkbox"/>	Going out:partner
NewsPaper	String		<input checked="" type="checkbox"/>	everyday
TV with	String		<input checked="" type="checkbox"/>	TV with:someone
Channel-01	String		<input checked="" type="checkbox"/>	TF1
Channel-02	String		<input checked="" type="checkbox"/>	France3
TPTVH	Integer		<input checked="" type="checkbox"/>	15
How many books	Integer		<input checked="" type="checkbox"/>	6
How many CS	Integer		<input checked="" type="checkbox"/>	20
ComicStripsIncluded?	String		<input checked="" type="checkbox"/>	no
Gender	String		<input checked="" type="checkbox"/>	male
Income	String		<input checked="" type="checkbox"/>	3050-3809€
Age	Integer		<input checked="" type="checkbox"/>	25
Education	String		<input checked="" type="checkbox"/>	Bac-BP-BT
CSP42	String		<input checked="" type="checkbox"/>	53-Employé de Commerce
Channel01+02	String		<input checked="" type="checkbox"/>	

Logical wizard
This logical wizard is the equivalent of the function _IF_(Condition, Value if True, Value if False).
It allows to specify many conditions conditions. The user specifies the values to return wheter the condition evaluates to true or not.

Function	Parameters	Values	Results
Logical assistant	Filter	[? Channel-01 : Channel-02]	Net : Channel01+02

Sort the categories automatically by their natural order Results : variable as prefix

Ok Cancel

Creating TV variable

The rule to create the new TV variable is now available. We have just to give a name to this new variable.

In the **Results** column you write a name for this new variable : here Channel01+02.



New variables generator

To create the new variable named **Books**, we shall first create a variable named **NbCS** (number of comic strips) taking into account the answer to the question : **Have you included comic strips** when answering to the question **How many books**. The values of **NbCS** will be the values of **How many CS** when the answer to the inclusion question is "no". In the other case, the value of **NbCS** will be 0.

Then the new variable **Books** will be constructed by adding **How many books** to **NbCS**.

To start double click again on **Logical assistant**. Then in the cell where you can read "double click", do it.

Creating Books variable

Input and created variables

Name	Storage	Role	Keep	Value
ID	String	id	<input checked="" type="checkbox"/>	1
More time	String		<input checked="" type="checkbox"/>	NoLackFreeTime
Going out	String		<input checked="" type="checkbox"/>	Going out:partner
NewsPaper	String		<input checked="" type="checkbox"/>	everyday
TV with	String		<input checked="" type="checkbox"/>	TV with:someone
Channel-01	String		<input checked="" type="checkbox"/>	TF1
Channel-02	String		<input checked="" type="checkbox"/>	France3
TPTVH	Integer		<input checked="" type="checkbox"/>	15
How many books	Integer		<input checked="" type="checkbox"/>	6
How many CS	Integer		<input checked="" type="checkbox"/>	20
ComicStripsIncluded?	String		<input checked="" type="checkbox"/>	no
Gender	String		<input checked="" type="checkbox"/>	male
Income	String		<input checked="" type="checkbox"/>	3050-3809€
Age	Integer		<input checked="" type="checkbox"/>	25
Education	String		<input checked="" type="checkbox"/>	Bac-BP-BT
CSP42	String		<input checked="" type="checkbox"/>	53-Employé de Commerce
Channel01+02	String		<input checked="" type="checkbox"/>	
If	String		<input checked="" type="checkbox"/>	

Logical wizard
This logical wizard is the equivalent of the function `_IF_(Condition, Value if True, Value if False)`. It allows to specify many conditions conditions. The user specifies the values to return whether the condition evaluates to true or not.

Successive transformations

Function	Parameters	Values	Results
Logical assistant	Filter	[? Channel-01 : Channel-02]	Net : Channel01+02
Logical assistant	Filter	Double-click	Net : If

Sort the categories automatically by their natural order Results : variable as prefix

Ok Cancel



New variables
generator

Creating Books variable

Here we have the variables list. Once you have double clicked on **ComicStrips included?** you will see the categories in the right window. Select = in the central column. Then select "yes" and Validate. You can see in the bottom window the condition. Finally don't forget to define in the **Results** window the type of the variable and the value when the condition is true (0) and when the condition is false (How many CS). Then **click OK**.

The screenshot shows the 'Logical assistant' window. The main table lists variables with columns for Index, Name, Storage, and Role. Variable 11, 'ComicStripsIncluded?', is selected. The 'Values' window on the right shows a table with columns for Index, Value, and Count, with '2 yes' selected. The 'Results' window at the bottom shows the condition 'ComicStripsIncluded? = yes' and the variable type set to 'Integer'. The 'If true' condition is set to 'Constant' with a value of 0, and the 'If false' condition is set to 'Variable' with the value 'How many CS'.

Index	Name	Storage	Role
1	ID	String	id
2	More time	String	
3	Going out	String	
4	NewsPaper	String	
5	TV with	String	
6	Channel-01	String	
7	Channel-02	String	
8	TPTVH	Integer	
9	How many books	Integer	
10	How many CS	Integer	
11	ComicStripsIncluded?	String	
12	Gender	String	
13	Income	String	
14	Age	Integer	
15	Education	String	
16	CSP42	String	
33	Channel01+02	String	

Index	Value	Count
1	no	2,636
2	yes	1,024
3	0	1,005

Number of _Missing_ : 0

Link: Condition: ComicStripsIncluded? = yes

Results: Type: Integer

If true: Constant: 0 Variable: ID _Missing_

If false: Constant: 0 Variable: How many CS _Missing_

Buttons: OK, Cancel, Help



New variables
generator

Creating Books variable

Finally we have to write the name of this new variable in the provided cell of the **Results** column.

The name will be **NbCS**.

Assistant logique({all})

Name	Storage	Role	Keep	Value
ID	String	id	<input checked="" type="checkbox"/>	1
More time	String		<input checked="" type="checkbox"/>	NoLackFreeTime
Going out	String		<input checked="" type="checkbox"/>	Going out:partner
NewsPaper	String		<input checked="" type="checkbox"/>	everyday
TV with	String		<input checked="" type="checkbox"/>	TV with:someone
Channel-01	String		<input checked="" type="checkbox"/>	TF1
Channel-02	String		<input checked="" type="checkbox"/>	France3
TPTVH	Integer		<input checked="" type="checkbox"/>	15
How many books	Integer		<input checked="" type="checkbox"/>	6
How many CS	Integer		<input checked="" type="checkbox"/>	20
ComicStripsIncluded?	String		<input checked="" type="checkbox"/>	no
Gender	String		<input checked="" type="checkbox"/>	male
Income	String		<input checked="" type="checkbox"/>	3050-3809€
Age	Integer		<input checked="" type="checkbox"/>	25
Education	String		<input checked="" type="checkbox"/>	Bac-BP-BT
CSP42	String		<input checked="" type="checkbox"/>	53-Employé de Commerce
Channel01+02	String		<input checked="" type="checkbox"/>	
NbCS	Integer		<input checked="" type="checkbox"/>	

Row 1 Test

Logical wizard
This logical wizard is the equivalent of the function _IF_(Condition, Value if True, Value if False). It allows to specify many conditions conditions. The user specifies the values to return whether the condition evaluates to true or not.

Function	Parameters	Values	Results
Logical assistant	Filter	[? Channel-01 : Channel-02]	Net : Channel01+02
Logical assistant	Filter	[? 0 : How many CS]	Net : NbCS

Sort the categories automatically by their natural order Results : variable as prefix

Ok Cancel



New variables generator

Creating Reading variable

New variables generator

Functions

- Conversion
- Date & Time
- Inspection
- Logical
- Math and Trigo
- Memory
- Statistical
- Statistical tests
- String
- Text
- Tools
 - Calculator
 - Logical assistant
 - Logical assistant (case)
 - Python script

Input and created variables

Name	Storage	Role	Keep	Value
ID	String	id	<input checked="" type="checkbox"/>	1
More time	String		<input checked="" type="checkbox"/>	NoLackFreeTime
Going out	String		<input checked="" type="checkbox"/>	Going out:partner
NewsPaper	String		<input checked="" type="checkbox"/>	everyday
TV with	String		<input checked="" type="checkbox"/>	TV with:someone
Channel-01	String		<input checked="" type="checkbox"/>	TF1
Channel-02	String		<input checked="" type="checkbox"/>	France3
TPTVH	Integer		<input checked="" type="checkbox"/>	15
How many books	Integer		<input checked="" type="checkbox"/>	6
How many CS	Integer		<input checked="" type="checkbox"/>	20
ComicStripsIncluded?	String		<input checked="" type="checkbox"/>	no
Gender	String		<input checked="" type="checkbox"/>	male
Income	String		<input checked="" type="checkbox"/>	3050-3809€
Age	Integer		<input checked="" type="checkbox"/>	25
Education	String		<input checked="" type="checkbox"/>	Bac-BP-BT
CSP42	String		<input checked="" type="checkbox"/>	53-Employé de Commerce
Channel01+02	String		<input checked="" type="checkbox"/>	
NbCS	Integer		<input checked="" type="checkbox"/>	

Calculatrice({float})

Row 1 Test

Calculator
The calculator allows you to define a formula based on the input variables. Usual mathematic functions are available.

Successive transformations

Function	Parameters	Values	Results
Logical assistant			
Logical assistant	Filter	[? Channel-01 : Channel-02]	Net : Channel01+02
Logical assistant	Filter	[? 0 : How many CS]	Net : NbCS
Calculator	Variables	Double-click	Num : Computation

Sort the categories automatically by their natural order Results : variable as prefix

Ok Cancel

Now let us deal with the second step : constructing the **Books** variable. It will be equal to the sum of **How many books** and **NbCS**. To do that double click on *Calculator* (left window). Then double click where it is written "double click".



New variables generator

Creating Books variable

Variable	Storage	Used?	Value
TPTVH	Integer	<input type="checkbox"/>	15
How many books	Integer	<input checked="" type="checkbox"/>	6
How many CS	Integer	<input type="checkbox"/>	20
Age	Integer	<input type="checkbox"/>	25
NbCS	Integer	<input checked="" type="checkbox"/>	57.236

Formula edition

```
FieldValue("How many books")+FieldValue("NbCS")
```

Warning, if one of the variables used in the expression contains a missing value, it returns a missing value

Automatically replace the missing data with 0 for the computation

OK Cancel

The *Calculator* window appears. There are only the numerical variables. Double click on **How many books** and the variable name will appear in the Formula edition window. Then click on + and finally double click on **NbCS**. The formula is complete.

Then **click OK**.



New variables generator

Creating Books variable

The 'Input and created variables' table is as follows:

Name	Storage	Role	Keep	Value
ID	String	id	<input checked="" type="checkbox"/>	1
More time	String		<input checked="" type="checkbox"/>	NoLackFr...
NewsPaper	String		<input checked="" type="checkbox"/>	everyday
TV with	String		<input checked="" type="checkbox"/>	TV with:so...
Channel-01	String		<input type="checkbox"/>	TF1
Channel-02	String		<input type="checkbox"/>	France3
How many books	Integer		<input type="checkbox"/>	6
How many CS	Integer		<input type="checkbox"/>	20
ComicStripsIncluded?	String		<input type="checkbox"/>	no
Gender	String		<input checked="" type="checkbox"/>	male
Income	String		<input checked="" type="checkbox"/>	3050-3809€
Education	String		<input checked="" type="checkbox"/>	Bac-BP-BT
CSP42	String		<input checked="" type="checkbox"/>	53-Emplo...
Rec_Going out	String		<input checked="" type="checkbox"/>	Going out...
Rec_Age	String		<input checked="" type="checkbox"/>	[25;35[
Rec_TPTVH	String		<input checked="" type="checkbox"/>	[10;20[
Channel01+02	String		<input checked="" type="checkbox"/>	
NbCS	Integer		<input type="checkbox"/>	
Books	Float		<input checked="" type="checkbox"/>	

The 'Successive transformations' table is as follows:

Function	Parameters	Values	Results
Logical assistant			
Logical assistant	Filter	[? Channel-01 : Channel-02]	Net : Channel01+02
Logical assistant	Filter	[? 0 : How many CS]	Net : NbCS
Calculator			
Calculator	Variables	[How many books, NbCS]	Num : Books

Finally we have to give a name to this new variable. It will be **Books**. You write it in the provided cell of the *Results* column.

As we have defined new variables we can uncheck old ones : **Channel01, Channel02, How many books, How many CS, ComicStrips included?, NbCS.**

We have defined our new variables, we can **click on OK**.



New variables generator

Creating Books variable

The screenshot displays the SPAD 9.1 interface for project LEISURE2019. The main workspace shows a process diagram with five steps: LEISURE.Sheet1, Missing data management, Logical filter, Binnings..., and New variables generator. Each step is marked with a green checkmark. Below the diagram is the 'Executions list' table.

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	LEISURE.Sheet1		✓ Completed (Ok)			5004 12:52 (05/09/2019)	00:00,593	
1	Missing data management		✓ Completed (Ok)			5004 12:52 (05/09/2019)	00:00,250	
2	Logical filter		✓ Completed (Ok)			4665 12:52 (05/09/2019)	00:00,437	
3	Binnings...		✓ Completed (Ok)			4665 12:06:33	00:00,422	
4	New variables generator		✓ Completed (Ok)			4665 12:24:37	00:00,484	

If the method is well executed (green circle) you can verify by looking at the variables that were involved in this method.



The screenshot displays the SPAD 9.1 interface for a project named 'LEISURE2019'. The main window shows a 'Data coding' diagram with a sequence of steps: 'LEISURE.Sheet1' (Excel icon), 'Missing data management' (empty set icon), 'Logical filter' (IF icon), 'Binnings...' (binning icon), 'New variables generator' (grid icon), and 'Binnings..._1' (binning icon with a play button). A dashed arrow connects the 'New variables generator' to the final 'Binnings..._1' step. Below the diagram, a text box provides instructions: 'We have to define classes for one variable : **Books**. We have also to group some categories for one variable : **Channel01+02**. To do that select in the Methods window *Data Management*, then *Columns-Variables* and *Binning-Grouping*. Drag the *Binning-Grouping* icon and drop it on the *New variables generator* icon in the Diagram window.'

Methods window content:

- Recently used methods
- Importing / Exporting data
- Data Management
 - Rows - Cases
 - Columns - Variables
 - Data validation
 - Formats
 - Edit the labels
 - Selection - Order
 - Juxtaposition
 - Merge
 - Binarization
 - Missing data management
 - Binning - Grouping**
 - New variables generator
 - Variables crossing
 - Recoding of multiple choice questions
 - Weight variable creation
- Supervised



Binnings...

Binning Books

Binning, category grouping

Available variables (22)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	Going out	String		8	<input checked="" type="checkbox"/>
4	NewsPaper	String		5	<input checked="" type="checkbox"/>
5	TV with	String		5	<input checked="" type="checkbox"/>
6	Channel-01	String		17	<input checked="" type="checkbox"/>
7	Channel-02	String		17	<input checked="" type="checkbox"/>
8	TPTVH	Integer			<input checked="" type="checkbox"/>
9	How many books	Integer			<input checked="" type="checkbox"/>
10	How many CS	Integer			<input checked="" type="checkbox"/>
11	ComicStripsIncluded?	String		3	<input checked="" type="checkbox"/>
12	Gender	String		2	<input checked="" type="checkbox"/>
13	Income	String		10	<input checked="" type="checkbox"/>
14	Age	Integer	Categorical		<input checked="" type="checkbox"/>
15	Education	String		10	<input checked="" type="checkbox"/>
16	CSP42	String		36	<input checked="" type="checkbox"/>
17	Rec_Going out	String		6	<input checked="" type="checkbox"/>
18	Rec_Age	String		7	<input checked="" type="checkbox"/>
19	Rec_TPTVH	String		5	<input checked="" type="checkbox"/>
20	Channel01+02	String		17	<input checked="" type="checkbox"/>
21	NbCS	Integer		39	<input checked="" type="checkbox"/>
22	Books	Float			<input checked="" type="checkbox"/>

Recorded variables (0)

Index	Name	Storage	Role	Method	Input variable
-------	------	---------	------	--------	----------------

Ok Cancel

Now we have to do the same thing we have already done before : with **Books** variable.

Right click on **Books** variable.

Choose *Binning*.



Binnings...

Binning Books

Binning of continuous variables

Binning method

Equal width Equal frequencies Manual bounds Manual percentages

List of upper bonds excluded separated by "/". Example 19/26/36/46/56/66/100

1/5/13/41

Parameters

Number of bins

Width

Minimum limit (included) Automatic Imposed

Maximum limit (excluded) Automatic Imposed

Use a weight variable

Specific parameters

Special value assigned to a supplementary bin Value Bin

Missing data put in an extra bin Bin

Labels format

New variables labels extension Prefix Suffix

Prefix the categories with the first characters of the variables label Number of characters

Created bin labels Generated by thresholds Numbered

Generate the bounds of the bins at the first execution

Data Management and bins calculation completed

Ok Cancel ?

Don't forget to click *Manual bounds*.

Bounds are : 1/5/13/41

Note: to define bounds you must have studied the **Books** distribution before.



Binnings...

Binning Books

Now you can see:

- the bounds you gave
- counts and percentages
- name of the new variable.

Click OK.

Binning

Use the formatting dialog box

Use the X first characters of the variables names as generic title of the categories. X:

Bin labels Generated by thresholds Generated by index Manual

Allow gaps between the bounds of the bins

Weight variable

Descriptive statistics

Min[0]	Number[4665]	Mean[22.353]
Max[1,011]	Number of _Missing_[0]	Standard deviation[93.307]

Column Count Count / %

Index	Bin	>=	<	Count / %
1	< 1	-∞	1	1,257.000
2	[1;5[	1	5	1,037.000
3	[5;13[	5	13	1,079.000
4	[13;41[	13	41	859.000
5	>= 41	41	∞	433.000

Specific parameters

Special value assigned to a supplementary bin Value Bin

Missing data put in an extra bin Bin

Name of the new variable



Binnings...

Binning Books

Binning, category grouping

Available variables (22)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	Going out	String		8	<input checked="" type="checkbox"/>
4	NewsPaper	String		5	<input checked="" type="checkbox"/>
5	TV with	String		5	<input checked="" type="checkbox"/>
6	Channel-01	String		17	<input checked="" type="checkbox"/>
7	Channel-02	String		17	<input checked="" type="checkbox"/>
8	TPTVH	Integer			<input checked="" type="checkbox"/>
9	How many books	Integer			<input checked="" type="checkbox"/>
10	How many CS	Integer			<input checked="" type="checkbox"/>
11	ComicStripsIncluded?	String	Continuous	3	<input checked="" type="checkbox"/>
12	Gender	String		2	<input checked="" type="checkbox"/>
13	Income	String		10	<input checked="" type="checkbox"/>
14	Age	Integer			<input checked="" type="checkbox"/>
15	Education	String		10	<input checked="" type="checkbox"/>
16	CSP42	String		36	<input checked="" type="checkbox"/>
17	Rec_Going out	String		6	<input checked="" type="checkbox"/>
18	Rec_Age	String		7	<input checked="" type="checkbox"/>
19	Rec_TPTVH	String		5	<input checked="" type="checkbox"/>
20	Channel01+02	String		17	<input checked="" type="checkbox"/>
21	NbCS	Integer		39	<input checked="" type="checkbox"/>
22	Books	Float			<input checked="" type="checkbox"/>

Recorded variables (1)

Index	Name	Storage	Role	Method	Input variable
1	Rec_Books	String		Binning	Books

Ok Cancel

Back to the general window of *Binning-Grouping*. See now the recoded variable in the bottom window.

If you want to change bounds or anything else, just right click on the line and choose *Edit*.

Next step will be *Grouping* categories for one variable : **Channel01+02**



Binnings...

Grouping Channel01+02

Binning, category grouping

Available variables (22)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	Going out	String		8	<input checked="" type="checkbox"/>
4	NewsPaper	String		5	<input checked="" type="checkbox"/>
5	TV with	String		5	<input checked="" type="checkbox"/>
6	Channel-01	String		17	<input checked="" type="checkbox"/>
7	Channel-02	String		17	<input checked="" type="checkbox"/>
8	TPTVH	Integer			<input checked="" type="checkbox"/>
9	How many books	Integer			<input checked="" type="checkbox"/>
10	How many CS	Integer			<input checked="" type="checkbox"/>
11	ComicStripsIncluded?	String		3	<input checked="" type="checkbox"/>
12	Gender	String		2	<input checked="" type="checkbox"/>
13	Income	String		10	<input checked="" type="checkbox"/>
14	Age	Integer			<input checked="" type="checkbox"/>
15	Education	String		10	<input checked="" type="checkbox"/>
16	CSP42	String		36	<input checked="" type="checkbox"/>
17	Rec_Going out	String		6	<input checked="" type="checkbox"/>
18	Rec_Age	String		7	<input checked="" type="checkbox"/>
19	Rec_TPTVH	String		5	<input checked="" type="checkbox"/>
20	Channel01+02	String		17	<input checked="" type="checkbox"/>
21	NbCS	Integer		39	<input checked="" type="checkbox"/>
22	Books	Float			<input checked="" type="checkbox"/>

Recorded variables (1)

Index	Name
1	Rec_Books

Context menu for Channel01+02:

- Binning
- Automatic binning
- Binning with a reference variable
- Dynamic binning
- Center-reduce
- Rank transformation
- Category grouping**
- Categorical into continuous

Summary table:

Role	Method	Input variable
	Binning	Books

Ok Cancel

Now we want to group categories for **Channel01+02** variable.

Right click on **Channel01+02** variable and choose *Category grouping*.



Binnings...

Grouping Channel01+02

Category grouping

Created variable(s) —

Name Storage

Value	New value	Count / %
0		0.364 %
11		0.493 %
12		0.236 %
13		0.386 %
14		0.450 %
15		0.364 %
16		0.557 %
17		0.665 %
19		0.064 %
Arte		5.788 %
Canal+		5.874 %
France2		13.505 %
France3		9.196 %
France5		4.394 %
M6		12.262 %
TF1		31.361 %
zapping		14.041 %

Number of _Missing_ (0)

Missing values processing —

No change

Recoded into

Other values processing —

Transformed into missing values

Each new value becomes a new category

Grouped in

OK Cancel

The first 9 categories without names are to be grouped.

Then the last eight categories are transferred as they are.



Grouping Channel01+02

Category grouping

Created variable(s)

Name: Rec_Channel01+02 Storage: String

Value	New value	Count / %
0	0	0.364 %
11	0	0.493 %
12	0	0.236 %
13	0	0.386 %
14	0	0.450 %
15	0	0.364 %
16	0	0.557 %
17	0	0.665 %
19	0	0.064 %
Arte	Arte	5.788 %
Canal+	Canal+	5.874 %
France2	France2	13.505 %
France3	France3	9.196 %
France5	France5	4.394 %
M6	M6	12.262 %
TF1	TF1	31.361 %
zapping	zapping	14.041 %

Order	New value	Values	Count / %
1	0	0, 11, 12, 13, 14, 15, 16, 17, ...	3.580 %
2	Arte	Arte	5.788 %
3	Canal+	Canal+	5.874 %
4	France2	France2	13.505 %
5	France3	France3	9.196 %
6	France5	France5	4.394 %
7	M6	M6	12.262 %
8	TF1	TF1	31.361 %
9	zapping	zapping	14.041 %

Number of _Missing_ (0)

Missing values processing

No change

Recoded into []

Other values processing

Transformed into missing values

Each new value becomes a new category

Grouped in []

OK Cancel

The first 9 categories without names are to be grouped.

Then the last eight categories are transferred as they are.

Click OK.



Binnings...

Grouping Channel01+02

Binning, category grouping

Available variables (13)

Index	Name	Storage	Role	Number of categories	Keep
1	ID	String	id		<input checked="" type="checkbox"/>
2	More time	String		9	<input checked="" type="checkbox"/>
3	NewsPaper	String		5	<input checked="" type="checkbox"/>
4	TV with	String		5	<input checked="" type="checkbox"/>
5	Gender	String		2	<input checked="" type="checkbox"/>
6	Income	String		10	<input checked="" type="checkbox"/>
7	Education	String		10	<input checked="" type="checkbox"/>
8	CSP42	String		36	<input checked="" type="checkbox"/>
9	Rec_Going out	String		6	<input checked="" type="checkbox"/>
10	Rec_Age	String		7	<input checked="" type="checkbox"/>
11	Rec_TPTVH	String		5	<input checked="" type="checkbox"/>
12	Channel01+02	String		17	<input type="checkbox"/>
13	Books	Float			<input checked="" type="checkbox"/>

Recoded variables (2)

Index	Name	Storage	Role	Method	Input variable
1	Rec_Books	String		Binning	Books
2	Rec_Channel01+02	String		Category grouping	Channel01+02

Ok Cancel

Back to the general window of **Binning-Grouping**. See now recoded variables in the bottom window. We can uncheck **Channel01+02**. But we keep **Books** because we need it for the next Logical filter.

We have finished what we wanted to do.

Click OK.



Binnings...

Binning - Grouping

The screenshot displays the SPAD 9.1 interface for a project named 'LEISURE2019'. The main window shows a process diagram with the following steps: LEISURE.Sheet1, Missing data management, Logical filter, Binnings..., New variables generator, and Binnings..._1. All steps are marked with green checkmarks, indicating successful completion. Below the diagram is an 'Executions list' table.

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	LEISURE.Sheet1		✓ Completed (Ok)			5004 12:52 (05/09/2019)	00:00,593	
1	Missing data management		✓ Completed (Ok)			5004 12:52 (05/09/2019)	00:00,250	
2	Logical filter		✓ Completed (Ok)			4665 12:52 (05/09/2019)	00:00,437	
3	Binnings...		✓ Completed (Ok)			4665 12:06:33	00:00,422	
4	New variables generator		✓ Completed (Ok)			4665 12:24:37	00:00,484	
5	Binnings..._1		✓ Completed (Ok)			4665 14:19:01	00:00,266	

A text box at the bottom of the screenshot contains the following text:

The ***Binning-Grouping*** has been successful.
The last step will be to remove individuals who have too many "no answers".



Logical filter

Logical filter

The screenshot shows the SPAD 9.1 interface for project LEISURE2019. The main window displays a process diagram with the following steps: LEISURE.Sheet1, Missing data management, Logical filter, Binnings..., New variables generator, Binnings..._1, and Logical filter_1. The Logical filter icon is highlighted in the Methods window on the left. The Methods window shows a tree structure under 'Data Management' with 'Rows - Cases' expanded, and 'Logical filter' selected. The 'Executions' window at the bottom shows logs and data.

We are going to exclude individuals who answer *Don't know* at the **More time** question or those whose answer to **Channel01+02** is *Other* or those who have ≥ 999 to **Books**.

In the Methods window select **Data Management**, then **Row – Cases** and **Logical filter**. Drag the **Logical filter** icon and drop it in Diagram window on the **Binning** icon. Then right click to define parameters.



Logical filter

Logical filter

Logical filter

Selection method Include Exclude

Index	Name	Storage	Role
1	ID	String	id
2	More time	String	
3	Going out	String	
4	NewsPaper	String	
5	TV with	String	
6	Channel-01	String	
7	Channel-02	String	
8	TPTVH	Integer	
9	How many books	Integer	
10	How many CS	Integer	
11	ComicStripsIncluded?	String	
12	Gender	String	
13	Income	String	
14	Age	Integer	
15	Education	String	
16	CSP42	String	
17	Rec_Going out	String	
18	Rec_Age	String	
19	Rec_TPTVH	String	
20	Channel01+02	String	
21	NbCS	Integer	
22	Books	Float	
23	Rec_Books	String	
24	Rec_Channel01+02	String	

Values Variable

Index	Value	Count
1	NoLackFreeTime	1,621
2	rest	241
3	home DIY	460
4	develop knowledge	390
5	take care of family	462
6	physical activity	820
7	artistic activity	457
8	to take courses	201
9	don't know	13

Number of _Missing_ : 0

AND OR Validate

(...)

Link	Condition
	More time = don't know

Remove the categories with zero count

Ok Cancel

The first and very important thing to verify is the selection method.

Here we will choose Exclude.

Click on **More time** variable (left window). Select = in the central column and *don't know* in the right window.

Click on OR and validate.



Logical filter

Logical filter

Logical filter

Selection method Include Exclude

Index	Name	Storage	Role
1	ID	String	id
2	More time	String	
3	Going out	String	
4	NewsPaper	String	
5	TV with	String	
6	Channel-01	String	
7	Channel-02	String	
8	TPTVH	Integer	
9	How many books	Integer	
10	How many CS	Integer	
11	ComicStripsIncluded?	String	
12	Gender	String	
13	Income	String	
14	Age	Integer	
15	Education	String	
16	CSP42	String	
17	Rec_Going out	String	
18	Rec_Age	String	
19	Rec_TPTVH	String	
20	Channel01+02	String	
21	NbCS	Integer	
22	Books	Float	
23	Rec_Books	String	
24	Rec_Channel01+02	String	

Values	Variable	
Index	Value	Count
1	0	167
2	Arte	270
3	Canal+	274
4	France2	630
5	France3	429
6	France5	205
7	M6	572
8	TF1	1,463
9	zapping	655

Number of _Missing_: 0

AND OR

Link	Condition
or	More time = don't know Rec_Channel01+02 = 0

Remove the categories with zero count

Click on **Rec_Channel01+02** in the left window and select = in the central column and *Other* in the right window.

Then validate.



Logical filter

Logical filter

Logical filter

Selection method Include Exclude

Index	Name	Storage	Role
1	ID	String	id
2	More time	String	
3	Going out	String	
4	NewsPaper	String	
5	TV with	String	
6	Channel-01	String	
7	Channel-02	String	
8	TPTVH	Integer	
9	How many books	Integer	
10	How many CS	Integer	
11	ComicStripsIncluded?	String	
12	Gender	String	
13	Income	String	
14	Age	Integer	
15	Education	String	
16	CSP42	String	
17	Rec_Going out	String	
18	Rec_Age	String	
19	Rec_TPTVH	String	
20	Channel01+02	String	
21	NbCS	Integer	
22	Books	Float	
23	Rec_Books	String	
24	Rec_Channel01+02	String	

Values \ Variable \

=
<>
< Mean : 22.353
<= Minimum : 0
> Maximum : 1,011
Value :

>=
= ∅
<> ∅

Number of _Missing_ : 0

AND OR

Link	Condition
	More time = don't know
or	Rec_Channel01+02 = 0
or	Books >= 999.0

Remove the categories with zero count

Last click on **Books** in the left window and select \geq in the central column and write 999 in the right window.

Then validate.

And **click OK**.



Logical filter

Logical filter

The screenshot displays the SPAD 9.1 interface for a project named 'LEISURE2019'. The main workspace shows a workflow diagram with the following steps: LEISURE.Sheet1, Missing data management, Logical filter, Binnings..., New variables generator, Binnings..._1, and Logical filter_1. Each step is represented by an icon with a green checkmark. The 'Logical filter' step is highlighted. The bottom panel shows a data table with columns: Index, ID, More time, Going out, NewsPaper, TV with, Channel-01, Channel-02, TPTVH, How many ..., How many ..., ComicStrips..., Gender, Income, and Age. The table contains 4450 rows and 24 columns. The 'Logical filter' method is selected in the 'Methods' panel on the left.

If the method is well executed you must have 4450 individuals left. You may have a green icon on the top right side of **Logical filter** icon but with another number of individuals left. This means that there are mistakes in the logical condition. In this case you have to return to Parameters of the method and see what is wrong.



Archiving clean file in the project

The screenshot shows the SPAD 9.1 interface with the following components:

- Project Window:** Shows the project name 'LEISURE2019' and a tree view with 'Process diagram' and 'Data coding'.
- Data coding Diagram:** A flowchart showing the process: 'LEISURE.Sheet1' (Excel icon) → 'Missing data management' (cylinder icon) → 'Logical filter' (IF icon) → 'Binnings...' (bar chart icon) → 'New variables generator' (table icon) → 'Binnings..._1' (bar chart icon) → 'Logical filter_1' (IF icon) → 'SPAD Data Archive file' (SPAD icon). Each step has a green checkmark.
- Methods Window:** A tree view under 'Importing / Exporting data' with 'Export' expanded, showing 'SPAD Data Archive file' selected.
- Executions Window:** A table with columns: Level, Element, Stop, Status, Logs, Indicator, Start, Time, Results.

Text in the diagram window:

Data are ready to be analyzed. We will archive the file in the project. To do that click on *Importing/Exporting data* and on *Exports* and on *SPAD Data Archive file*. Drag the *SPAD Data Archive file* icon and drop it on the *Logical filter* icon in the Diagram window.



Archiving clean file in the project

.SDA file export

Data location

.SDA file direct

.SDA file in the project LEISURE2

Connection <No connection>

File

Parameters

Delete file if exists

Ok Cancel ?

The Spad Data Archive (SDA) is saved in the project. Do not forget to click the parameters cell. This archiving step is an Export though it is inside the project. To use this file in the same project, in the same diagram or another you will have to execute an Import.



File is ready

The screenshot displays the SPAD 9.1 interface for a project named 'LEISURE2019'. The top-left pane shows a project tree with 'Archived data' containing 'LEISURE2'. The top-right pane shows a process diagram with the following steps: LEISURE.Sheet1 (Excel icon) → Missing data management (LX icon) → Logical filter (IF icon) → Binnings... (Binnings icon) → New variables generator (New variables icon) → Binnings..._1 (Binnings icon) → Logical filter_1 (IF icon) → LEISURE2 (SPAD icon). All steps have green checkmarks. The bottom-left pane shows a 'Methods' list with 'SPAD Data Archive file' selected. The bottom-right pane shows an 'Executions list' table with the following data:

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	LEISURE.Sheet1		Completed (Ok)			5004 12:52 (05/09/2019)	00:00,593	
1	Missing data management		Completed (Ok)			5004 12:52 (05/09/2019)	00:00,250	
2	Logical filter		Completed (Ok)			4665 12:52 (05/09/2019)	00:00,437	
3	Binnings...		Completed (Ok)			4665 12:06:33	00:00,422	
4	New variables generator		Completed (Ok)			4665 12:24:37	00:00,484	
5	Binnings..._1		Completed (Ok)			4665 14:19:01	00:00,266	
6	Logical filter_1		Completed (Ok)			4450 14:29:08	00:00,738	
7	LEISURE2		Completed (Ok)			4450 14:37:29	00:00,240	

All methods were properly executed. There is now a clean file named LEISURE2. Now we will sort the variables we need and sort their categories.

Note: in the top left window there is "Archived data". Do not forget to import this clean file.



New diagram

The screenshot shows the SPAD 9.1 interface with a process diagram and an executions list table.

Process Diagram: A flowchart showing the execution of a process. The steps are: LEISURE.Sheet1 (input) → Missing data management → Logical filter → Binnings... → New variables generator → Binnings..._1 → Logical filter (output). Each step is represented by an icon and has a green checkmark above it, indicating successful completion.

Executions list table:

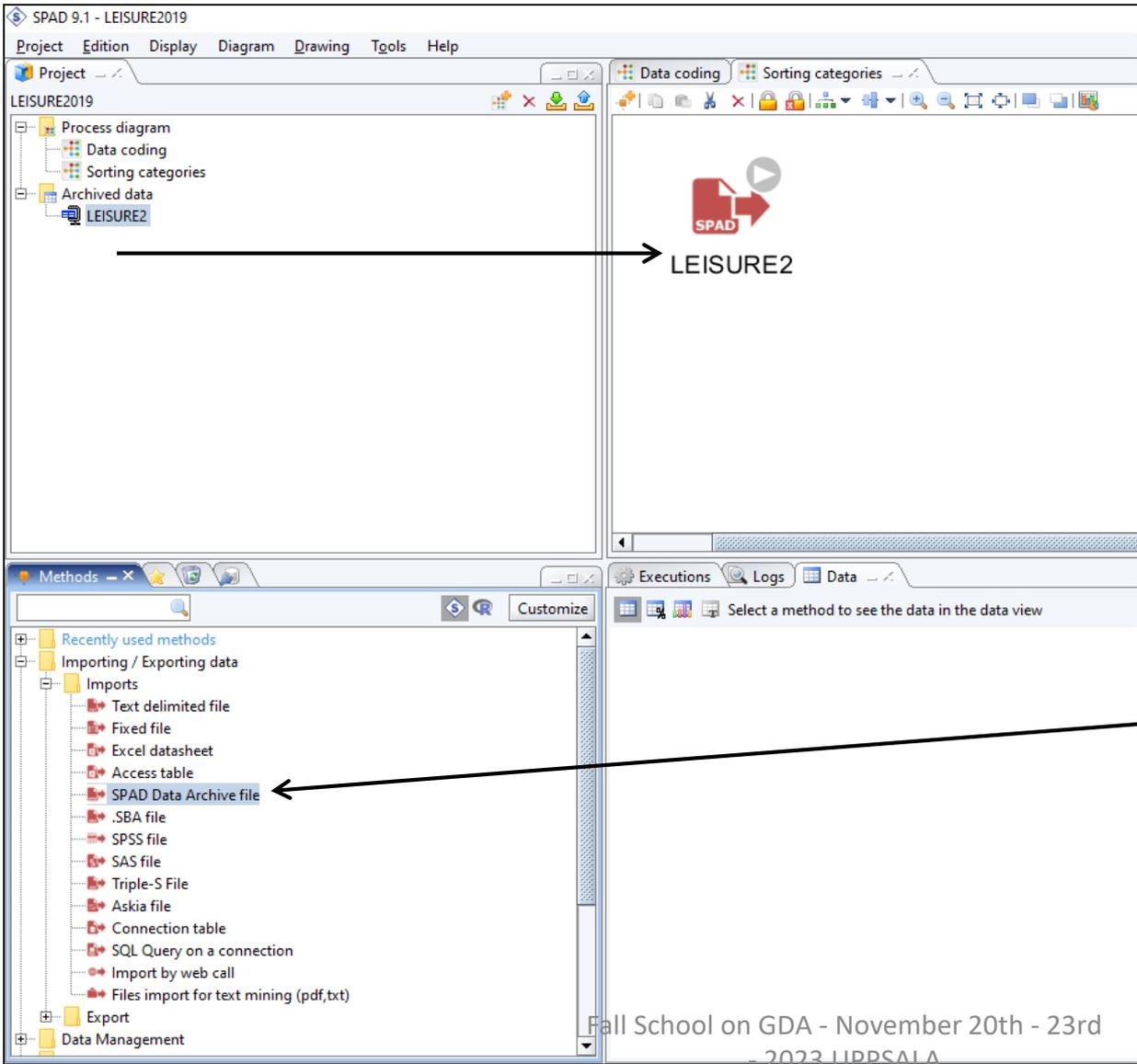
Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	LEISURE.Sheet1		✓ Completed (Ok)		5004	12:52 (05/09/2019)	00:00,593	
1	Missing data management		✓ Completed (Ok)		5004	12:52 (05/09/2019)	00:00,250	
2	Logical filter		✓ Completed (Ok)		4665	12:52 (05/09/2019)	00:00,437	
3	Binnings...		✓ Completed (Ok)		4665	12:06:33	00:00,422	
4	New variables generator		✓ Completed (Ok)		4665	12:24:37	00:00,484	
5	Binnings..._1		✓ Completed (Ok)		4665	14:19:01	00:00,266	
6	Logical filter_1		✓ Completed (Ok)		4450	14:29:08	00:00,738	
7	LEISURE2		✓ Completed (Ok)		4450	14:37:29	00:00,240	

To run our analyses we will open a new diagram window. Click on Diagram tab and then on New Diagram in the drop-down menu.



SPAD Data Archive file

New diagram



There are two ways of proceeding :

a) Drag and drop the file LEISURE2 from Project window to Diagram window. Then right click on the icon and Execute.

b) In the Methods window click on

Importing/Exporting data and on ***Imports*** and on ***SPAD Data Archive file***. Drag and drop the ***SPAD Data Archive file*** in the diagram window and right click to define parameters.



New diagram

Data location

.SDA file direct

.SDA file in the project LEISURE2

Connection <No connection>

File

Data view

ID	More time	Going out	NewsPaper	TV with	Channel-01	Channel-02	TPTVH	How many
1	NoLackFree...	Going out:p...	everyday	TV with:so...	TF1	France3	15	6
3	home DIY	Going out:p...	< once/week	TV with:dep...	TF1	M6	81	5
4	develop kn...	Going out:f...	< once/week	TV with:dep...	M6	TF1	14	20
5	home DIY	Going out:g...	everyday	TV with:so...	zapping	0	19	3
6	rest	Going out:f...	< once/week	TV with:dep...	Arte	Canal+	12	3
7	home DIY	DontGoOut	everyday	TV with:dep...	TF1	France2	30	0
8	take care of...	Going out:f...	< once/week	TV with:dep...	TF1	France2	11	10
9	develop kn...	Going out:p...	> once/week	TV with:so...	Arte	M6	12	24
10	NoLackFree...	Going out:g...	never	TV with:alone	France3	17	24	50
11	NoLackFree...	Going out:f...	once/week	TV with:alone	TF1	France5	42	100

Display the values/categories index

Sample at import

Limit the number of imported rows 1000

Random sampling (probability) 0.1

Import

Ok Cancel

If the second way was chosen
Click on SDA file in the project.
Then click on the little arrow at the right end of the window. Name of the file will appear.
Click on it.
Then OK.



SPAD Data Archive
file

New diagram

The screenshot shows the SPAD 9.1 interface for a project named 'LEISURE2019'. The top menu includes Project, Edition, Display, Diagram, Drawing, Tools, and Help. The left sidebar shows a project tree with folders for Process diagram, Diagram, Analyses, and Archived data. The main workspace displays a diagram with the SPAD logo and the word 'LEISURE'. Below the workspace, there are tabs for Methods, Executions, Logs, and Data. The Data tab is active, showing a table with 24 columns and 4450 rows. The table columns include Index, ID, More time, Going out, NewsPaper, TV with, Channel-01, Channel-02, TPTVH, How many..., ComicStrips..., Gender, Income, and Age. The table contains various entries related to leisure activities and media consumption.

Index	ID	More time	Going out	NewsPaper	TV with	Channel-01	Channel-02	TPTVH	How many ...	How many ...	ComicStrips...	Gender	Income	Age
1		NoLackFree... Going outp... everyday	TV withso...	TF1	France3			15	6	20	no	male	3050-3809€	25
2	3	home DIY	More time	http... <once/week	TV withdep...	TF1	M6	81	5	1	no	female	1905-2289€	26
3	4	develop kn...	Going outf...	<once/week	TV withdep...	M6	TF1	14	20	20	no	male	915-1219€	19
4	5	home DIY	Going outg...	everyday	TV withso...	zapping	0	19	3	10	no	male	2290-3049€	71
5	6	rest	Going outf...	<once/week	TV withdep...	Arte	Canal+	12	3	2	no	female	2290-3049€	64
6	7	home DIY	DontGoOut	everyday	TV withdep...	TF1	France2	30	0	0	0	female	1220-1524€	77
7	8	take care of...	Going outf...	<once/week	TV withdep...	TF1	France2	11	10	0	no	female	915-1219€	32
8	9	develop kn...	Going outp...	>once/week	TV withso...	Arte	M6	12	24	0	no	female	3810-6099€	41
9	10	NoLackFree... Going outg...	never	TV withalone	France3	17		24	50	0	no	female	1525-1904€	67
10	11	NoLackFree... Going outf...	once/week	TV withalone	TF1	France5		42	100	0	yes	female	2290-3049€	84
11	12	physical act... DontGoOut	never	TV withalone	France3	TF1		10	3	4	no	male	915-1219€	29
12	13	NoLackFree... DontGoOut	never	TV withalone	TF1	France2		35	100	0	no	female	915-1219€	83
13	14	physical act... Going outp...	>once/week	TV withso...	TF1	M6		30	0	3	no	female	1220-1524€	58
14	15	take care of... DontGoOut	once/week	TV withalone	TF1	M6		14	100	60	yes	female	1905-2289€	45
15	16	develop kn... DontGoOut	once/week	TV withso...	France2	Arte		18	20	0	no	female	1525-1904€	74
16	17	develop kn... Going outf...	<once/week	TV withso...	M6	zapping		15	0	0	0	female	3050-3809€	27
17	18	NoLackFree... DontGoOut	<once/week	TV withalone	TF1	zapping		25	15	0	no	female	1220-1524€	73
18	19	physical act... Going outf...	<once/week	TV withalone	TF1	France2		14	5	0	no	male	NA	70



SPAD Data Archive
file

New diagram

The screenshot shows the SPAD 9.1 software interface. The main workspace displays a new diagram named "LEISURE2" with the SPAD logo and a green checkmark. The project tree on the left shows the structure of the "LEISURE2019" project, including "Process diagram", "Data coding", "Sorting categories", "Archived data", and "LEISURE2". The "Methods" panel on the bottom left lists various data import and export methods, with "SPAD Data Archive file" highlighted. The "Executions list" table on the bottom right shows the execution status of the "LEISURE2" diagram.

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	LEISURE2		✓ Completed (Ok)			4450 18:27:43	00:00,735	

In this new diagram we will edit labels, sort categories and select variables we need for further analyses.



Edit the labels

Sorting categories

The screenshot shows the SPAD 9.1 interface for a project named LEISURE2019. The main diagram window displays a process flow from 'Leisure2019.DATA' to 'Edit the labels'. The 'Methods' window is open, showing a tree view of data management methods, with 'Edit the labels' selected under 'Columns - Variables'. The 'Executions list' window shows the execution history.

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	Leisure2019.DATA		✓ Completed (Ok)			5004 18:15 (07/08/2019)	00:00,359	
1	Edit the labels		Not started					

In the Methods window select *Data Management*, then *Columns - Variables* and *Edit the labels*. Drag the *Edit the labels* icon in the Diagram window and drop it on the *Excelsheet* icon. Right click to define parameters of the method.



Edit the labels

Sorting categories

The screenshot shows the 'Labels edition' dialog box with two main panels: 'Variables list' on the left and 'Categories list' on the right. The 'Variables list' table has columns for Index, Variable, New name, M, Storage, and Role. The 'Categories list' table has columns for Index, Value, Forme, Former value, and Count. A 'Reinitialization' dropdown is set to 100. A checkbox 'Always delete categories with zero count' is checked. Buttons for 'Ok', 'Cancel', and a help icon are at the bottom right.

Index	Variable	New name	M	Storage	Role
1	ID			String	id
2	More time		X	String	
3	NewsPaper			String	
4	TV with			String	
5	Gender			String	
6	Income			String	
7	Education			String	
8	CSP42			String	
9	Rec_Going out			String	
10	Rec_Age			String	
11	Rec_TPTVH			String	
12	Books			Float	
13	Rec_Books			String	
14	Rec_Channel01+02			String	

Index	Value	Forme	Former value	Count
1	NoLackFreeTime	1	NoLackFreeTime	1,552
2	rest	2	rest	229
3	to take courses	8	to take courses	194
4	physical activity	6	physical activity	786
5	artistic activity	7	artistic activity	435
6	develop knowledge	4	develop knowledge	372
7	take care of family	5	take care of family	447
8	home DIY	3	home DIY	435
9	don't know	9	don't know	0

Stockage des nouvelles valeurs : <Inchangé>

By clicking on any variable in the left window, the categories of the variable will appear in the right window. You can change the name of the variable in the left window and change the labels of the categories as well as the order of the categories in the right window. Then OK. In the left window, when a variable has been modified (name, categories) there is an "X".



Edit the labels

Sorting categories

Labels edition

Variables list

Index	Variable	New name	M	Storage	Role
1	ID			String	id
2	More time		X	String	
3	NewsPaper			String	
4	TV with			String	
5	Gender			String	
6	Income			String	
7	Education			String	
8	CSP42			String	
9	Rec_Going out	Going out		String	
10	Rec_Age			String	
11	Rec_TPTVH			String	
12	Books			Float	
13	Rec_Books			String	
14	Rec_Channel01+02			String	

Categories list

Reinitialization ↓ 100 + × ↕

Index	Value	Forme	Former value	Count
1	Going out:alone	2	Going out:alone	342
2	Going out:partner	1	Going out:partner	1,451
3	Going out:family	4	Going out:family	981
4	Going out:friends	3	Going out:friends	726
5	Going out:group	6	Going out:group	240
6	DontGoOut	5	DontGoOut	710

Stockage des nouvelles valeurs : <Inchangé>

Always delete categories with zero count

Ok Cancel

Rec_Going out : changing the name and sorting categories. Then OK.

Don't forget to click the option.



Edit the labels

Sorting categories

Labels edition

Variables list

Index	Variable	New name	M	Storage	Role
1	ID			String	id
2	More time		X	String	
3	NewsPaper			String	
4	TV with			String	
5	Gender			String	
6	Income			String	
7	Education			String	
8	CSP42			String	
9	Rec_Going out	Going out	X	String	
10	Rec_Age			String	
11	Rec_TPTVH			String	
12	Books			Float	
13	Rec_Books			String	
14	Rec_Channel01+02			String	

Categories list

Reinitialization ↓ 100 + × ↕

Index	Value	Forme	Former value	Count
1	everyday	1 everyday		1,355
2	>once/week	3 >once/week		489
3	once/week	5 once/week		682
4	<once/week	2 <once/week		612
5	never	4 never		1,312

Stockage des nouvelles valeurs : <Inchangé>

Always delete categories with zero count

Ok Cancel ↻

NewsPaper : sorting categories. Then OK.
Don't forget to click the option.



Edit the labels

Sorting categories

Labels edition

Variables list

Index	Variable	New name	M	Storage	Role
1	ID			String	id
2	More time		X	String	
3	NewsPaper		X	String	
4	TV with			String	
5	Gender			String	
6	Income			String	
7	Education			String	
8	CSP42			String	
9	Rec_Going out	Going out	X	String	
10	Rec_Age			String	
11	Rec_TPTVH			String	
12	Books			Float	
13	Rec_Books			String	
14	Rec_Channel01+02			String	

Categories list

Reinitialization ↓₁₀₀ + × ↕

Index	Value	Forme	Former value	Count
1	TV with:alone	2 TV with:alone		1,639
2	TV with:someone	1 TV with:someone		1,998
3	TV with:dependsProg	4 TV with:dependsProg		322
4	TV with:dependsTime	3 TV with:dependsTime		491
5	0	5 0		0

Stockage des nouvelles valeurs : <Inchangé>

Always delete categories with zero count

Ok Cancel ↻

TV with : sorting categories. Then OK.
Don't forget to click the option.



Edit the labels

Sorting categories

Labels edition

Variables list

Index	Variable	New name	M	Storage	Role
1	ID			String	id
2	More time		X	String	
3	NewsPaper		X	String	
4	TV with		X	String	
5	Gender			String	
6	Income			String	
7	Education			String	
8	CSP42			String	
9	Rec_Going out	Going out	X	String	
10	Rec_Age			String	
11	Rec_TPTVH			String	
12	Books			Float	
13	Rec_Books			String	
14	Rec_Channel01+02	TV-Channels		String	

Categories list

Reinitialization ↓₁₀₀ + × ↕

Index	Value	Forme	Former value	Count
1	TF1	8	TF1	1,456
2	France2	4	France2	624
3	France3	5	France3	425
4	Canal+	3	Canal+	270
5	France5	6	France5	198
6	Arte	2	Arte	266
7	M6	7	M6	571
8	zapping	9	zapping	640
9	0	10	0	0

Stockage des nouvelles valeurs : <Inchangé>

Always delete categories with zero count

Ok Cancel ↻

Rec_Channel01+02 : changing the name and sorting categories. Then OK.
Don't forget to click the option.



Edit the labels

Sorting categories

Labels edition

Variables list

Index	Variable	New name	M	Storage	Role
1	ID			String	id
2	More time		X	String	
3	NewsPaper		X	String	
4	TV with		X	String	
5	Gender			String	
6	Income			String	
7	Education			String	
8	CSP42			String	
9	Rec_Going out	Going out	X	String	
10	Rec_Age			String	
11	Rec_TPTVH			String	
12	Books			Float	
13	Rec_Books			String	
14	Rec_Channel01+02	TV-Channels	X	String	

Categories list

Reinitialization \downarrow_{100} + X

Index	Value	Forme	Former value	Count
1	< 5	1 < 5		240
2	[5;10[	2 [5;10[		607
3	[10;20[	3 [10;20[		1,694
4	[20;35[	4 [20;35[		1,273
5	>= 35	5 >= 35		636

Stockage des nouvelles valeurs : <Inchangé>

Always delete categories with zero count

Ok Cancel

Rec_TPTVH : changing the name and sorting categories. Then OK.
Don't forget to click the option.



Edit the labels

Sorting categories

Labels edition

Variables list

Index	Variable	New name	M	Storage	Role
1	ID			String	id
2	More time		X	String	
3	NewsPaper		X	String	
4	TV with		X	String	
5	Gender			String	
6	Income			String	
7	Education			String	
8	CSP42			String	
9	Rec_Going out	Going out	X	String	
10	Rec_Age			String	
11	Rec_TPTVH			String	
12	Books			Float	
13	Rec_Books	Reading		String	
14	Rec_Channel01+02	TV-Channels	X	String	

Categories list

Reinitialization \downarrow_{100} + ×

Index	Value	Forme	Former value	Count
1	< 1	1 < 1		1,209
2	[1;5[	2 [1;5[		1,004
3	[5;13[	3 [5;13[		1,037
4	[13;41[	4 [13;41[		822
5	>= 41	5 >= 41		378

Stockage des nouvelles valeurs : <Inchangé>

Always delete categories with zero count

Ok Cancel

Rec_Books : changing the name and sorting categories. Then OK.
Don't forget to click the option.



Edit the labels

Sorting categories

Labels edition

Variables list

Index	Variable	New name	M	Storage	Role
1	ID			String	id
2	More time		X	String	
3	NewsPaper		X	String	
4	TV with		X	String	
5	Gender			String	
6	Income			String	
7	Education			String	
8	CSP42			String	
9	Rec_Going out	Going out	X	String	
10	Rec_Age			String	
11	Rec_TPTVH			String	
12	Books			Float	
13	Rec_Books	Reading		String	
14	Rec_Channel01+02	TV-Channels	X	String	

Categories list

Reinitialization ↓ 1.00 + × ↕

Index	Value	Forme	Former value	Count
1	<915€	9	<915€	404
2	915-1219€	4	915-1219€	380
3	1220-1524€	6	1220-1524€	454
4	1525-1904€	8	1525-1904€	523
5	1905-2289€	3	1905-2289€	482
6	2290-3049€	5	2290-3049€	657
7	3050-3809€	1	3050-3809€	410
8	3810-6099€	7	3810-6099€	319
9	>6099€	10	>6099€	85
10	NA	2	NA	736

Stockage des nouvelles valeurs : <Inchangé>

Always delete categories with zero count

Ok Cancel ↻

Income : sorting categories. Then OK.
 Don't forget to click the option.



Edit the labels

Sorting categories

Labels edition

Variables list

Index	Variable	New name	M	Storage	Role
1	ID			String	id
2	More time		X	String	
3	NewsPaper		X	String	
4	TV with		X	String	
5	Gender			String	
6	Income		X	String	
7	Education			String	
8	CSP42			String	
9	Rec_Going out	Going out	X	String	
10	Rec_Age			String	
11	Rec_TPTVH			String	
12	Books			Float	
13	Rec_Books	Reading		String	
14	Rec_Channel01+02	TV-Channels	X	String	

Categories list

Reinitialization ↓ 100 + × ↕

Index	Value	Forme	Former value	Count
1	aucun	7 aucun		564
2	CEP	2 CEP		536
3	BEPC	4 BEPC		276
4	CAP-BEP	5 CAP-BEP		1,157
5	Bac-BP-BT	1 Bac-BP-BT		705
6	DEUG-DUT-Santé	3 DEUG-DUT-Santé		436
7	Licence	8 Licence		111
8	MasterDessGdeEcole	6 MasterDessGdeEcole		460
9	refus	9 refus		3
10	0	10 0		202

Stockage des nouvelles valeurs : <Inchangé>

Always delete categories with zero count

Ok Cancel

Education : changing the name and sorting categories. Then OK.
Don't forget to click the option.



Edit the labels

Selection-Order

The screenshot shows the SPAD 9.1.1 interface. The main window displays a process diagram with three steps: 'LEISURE2' (SPAD icon), 'Edit the labels' (A L B icon), and 'Selection-Order' (grid icon). A context menu is open over the 'Selection-Order' icon, listing options like Parameters, Execute, Copy, Paste, Add/Insert a method, Rename, Delete, and Description/Comment. The 'Methods' window on the left shows a tree view with 'Data Management' expanded, and 'Selection - Order' selected under 'Columns - Variables'.

In the Methods window select *Data Management*, then *Columns - Variables* and *Selection-Order*. Drag the *Selection-Order* icon in the Diagram window and drop it on the *Edit_the_labels* icon. Right click to define parameters of the method.



Edit the labels

Selection-Order

Selection - Order

Available variables : 14

Index	Name	Storage	Role	Number of Categories	Number of Missing	Min	Max	Mean	Standard deviation	Sum
1	ID	String	id		0					
2	More time	String		8	0					
3	NewsPaper	String		5	0					
4	TV with	String		4	0					
5	Gender	String		2	0					
6	Income	String		10	0					
7	Education	String		10	0					
8	CSP42	String		36	0					
9	Going out	String		6	0					
10	Age	String		6	0					
11	TV-Hours	String		5	0					
12	Books	Float			0	0	800	14.404	32.630	64,098
13	Reading	String		5	0					
14	TV-Channels	String		8	0					

Retained variables : 0

Index	Variable	New name	Former index	Storage	Role	Number of Categories
-------	----------	----------	--------------	---------	------	----------------------

Ok Cancel

The aim is to select the variables we need for further analyses and only them. To do that we must click on one variable and then on the blue arrow pointing down. The variable will be in the bottom window.



Edit the labels

Selection-Order

Here are the variables we are keeping in the wanted order.

Selection - Order

Available variables : 1

Index	Name	Storage	Role	Number of Categories	Number of Missing	Min	Max	Mean	Standard deviation	Sum
12	Books	Float			0	0	800	14.404	32.630	64,098

Retained variables : 13

Index	Variable	New name	Former index	Storage	Role	Number of Categories
1	ID	ID		1 String	id	
2	More time	More time		2 String		
3	Going out	Going out		9 String		
4	NewsPaper	NewsPaper		3 String		
5	TV with	TV with		4 String		
6	TV-Channels	TV-Channels		14 String		
7	TV-Hours	TV-Hours		11 String		
8	Reading	Reading		13 String		
9	Gender	Gender		5 String		
10	Age	Age		10 String		
11	Education	Education		7 String		1
12	Income	Income		6 String		1
13	CSP42	CSP42		8 String		3

Ok Cancel



Archiving definitive file in the project

The screenshot shows the SPAD 9.1.1 interface. The main window displays a process diagram with four steps: LEISURE2 (SPAD icon), Edit the labels (A to B icon), Selection - Order (table icon), and SPAD Data file (SPAD icon). A context menu is open over the SPAD Data file icon, showing options like Parameters, Cancel the execution, Execute, Results, Copy, Paste, Add/Insert a method, Rename, Delete, and Description/Comment. The left sidebar shows the Project tree with 'Archived data' selected. The bottom sidebar shows the Methods list, with 'SPAD Data Archive file' highlighted under the 'Export' category.

Data are ready to be analyzed. We will archive this final file in the project. To do that click on *Importing/Exporting data* and on *Exports* and on *SPAD Data Archive file*. Drag the *SPAD Data Archive file* icon and drop it on the *Selection-Order* icon in the Diagram window.



Archiving definitive file in the project

.SDA file export

Data location

.SDA file direct

.SDA file in the project LEISURE

Connection <No connection>

File

Parameters

Delete file if exists

Ok Cancel

The Spad Data Archive (SDA) is saved in the project. Do not forget to click the parameters cell. This archiving step is an Export though it is inside the project.

To use this file in the same project, in the same diagram or another you will have to execute an Import. Then **click OK**.



Archiving definitive file in the project

The screenshot shows the SPAD 9.1 interface for a project named 'LEISURE2019'. The top left pane displays a project tree with folders for 'Process diagram', 'Data coding', 'Sorting categories', and 'Archived data'. Under 'Archived data', two files named 'LEISURE2' and 'LEISURE' are listed. A black arrow points from this list to the 'Executions' table below. The main workspace shows a process diagram with four steps: 'LEISURE2' (SPAD icon), 'Edit the labels' (A/B icon), 'Selection - Order' (table icon), and 'LEISURE' (SPAD icon). All steps have green checkmarks. The bottom right pane shows the 'Executions' table with the following data:

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	LEISURE2		✓ Completed (Ok)		4450	19:09 (06/09/2019)	00:00,796	
1	Edit the labels		✓ Completed (Ok)			19:30 (06/09/2019)	00:00,375	
2	Selection - Order		✓ Completed (Ok)			15:52:22	00:00,172	
3	LEISURE		✓ Completed (Ok)		4450	16:01:11	00:00,250	

Data are ready to be analyzed.

Note: the names of the two files inside the project are in the top left window.



SPAD Data Archive
file

New diagram

The screenshot shows the SPAD 9.1 interface for a project named LEISURE2019. The main window displays a process diagram with four steps: LEISURE2 (SPAD icon), Edit the labels (A to B icon), Selection - Order (table icon), and LEISURE (SPAD icon). A 'Diagram' menu is open, showing 'New diagram' as the selected option. Below the diagram, an 'Executions list' table shows the following data:

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	LEISURE2		✓ Completed (Ok)			4450 19:09 (06/09/2019)	00:00,796	
1	Edit the labels		✓ Completed (Ok)			19:30 (06/09/2019)	00:00,375	
2	Selection - Order		✓ Completed (Ok)			15:52:22	00:00,172	
3	LEISURE		✓ Completed (Ok)			4450 16:01:11	00:00,250	

To run our analyses, we will open a new diagram window. Click on Diagram tab and then on New Diagram in the drop-down menu.



SPAD Data Archive
file

New diagram

The screenshot shows the SPAD 9.1 interface. The 'Project' window on the left lists 'LEISURE' under 'Archived data'. The 'Diagram' window in the center shows a SPAD icon with a context menu open, where 'Execute' (F5) is selected. The 'Executions' window at the bottom contains the following table:

Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	LEISURE		Not started					

Import the last file we saved : Drag and drop the file LEISURE from Project window to Diagram window. Then right click on the icon and Execute.



Standard statistics

Some statistics

The screenshot shows the SPAD 9.1 interface with the following components:

- Project window:** Shows a tree view with 'Process diagram', 'Data coding', 'Sorting categories', 'Statistics', and 'Archived data' (LEISURE2, LEISURE).
- Diagram window:** Displays a flow diagram: a red 'SPAD' icon with a green checkmark and arrow points to a green bar chart icon with a play button. Below the icons are the labels 'LEISURE' and 'Standard statistics'.
- Methods window:** Lists various statistical methods. Under 'Descriptive statistics and tests', 'Standard statistics' is highlighted.
- Executions list table:**

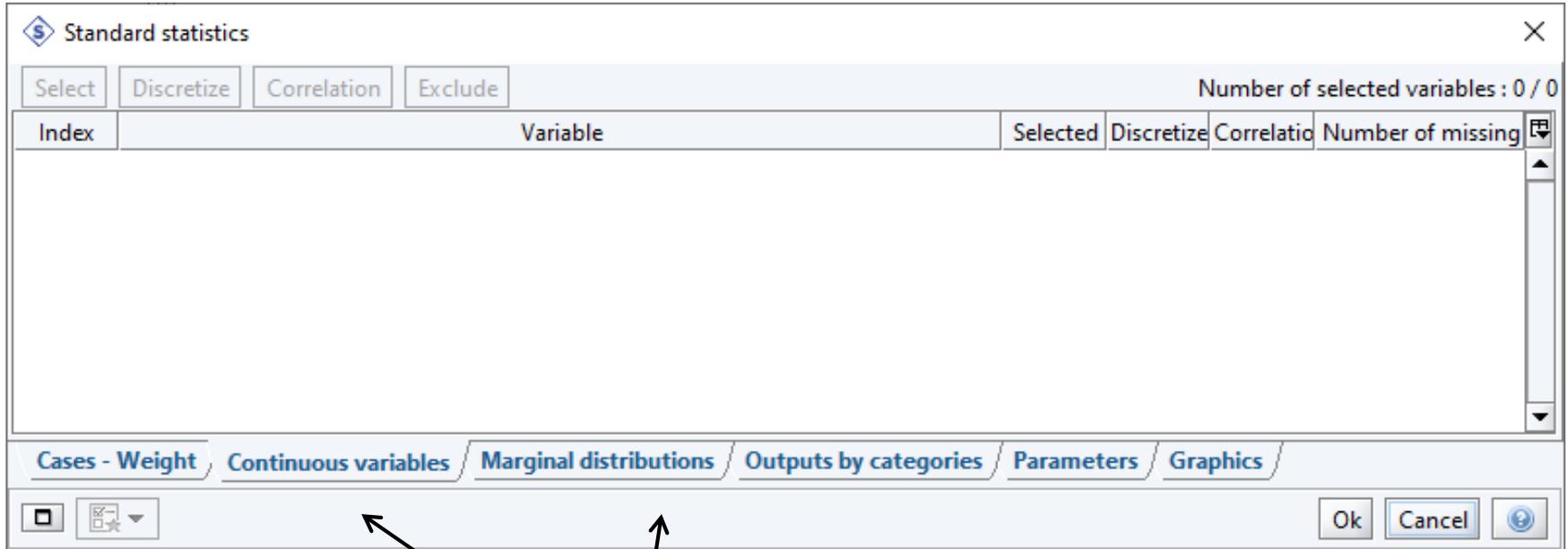
Level	Element	Stop	Status	Logs	Indicator	Start	Time	Results
0	LEISURE		✓ Completed (Ok)			4450 16:20:28	00:00,765	
1	Standard statistics		Not started					

In the Methods window select *Descriptive statistics and tests* and drag and drop the *Standard statistics* icon in the diagram window. Then right click to define parameters.



Standard statistics

Some statistics



The active tab is here : *Continuous variables*. It is the default tab when opening the Parameters window. In this file there are no continuous variables.

Then select the *Marginal distributions* tab.



Standard statistics

Some statistics

Standard statistics

Select Un-select

Number of selected variables : 12 / 12

Index	Variable	Selected	Number of categories	Number of missing
2	More time	<input checked="" type="checkbox"/>	8	0
3	Going out	<input checked="" type="checkbox"/>	6	0
4	NewsPaper	<input checked="" type="checkbox"/>	5	0
5	TV with	<input checked="" type="checkbox"/>	4	0
6	TV-Channels	<input checked="" type="checkbox"/>	8	0
7	TV-Hours	<input checked="" type="checkbox"/>	5	0
8	Reading	<input checked="" type="checkbox"/>	5	0
9	Gender	<input checked="" type="checkbox"/>	2	0
10	Age	<input checked="" type="checkbox"/>	6	0
11	Education	<input checked="" type="checkbox"/>	10	0
12	Income	<input checked="" type="checkbox"/>	10	0
13	CSP42	<input checked="" type="checkbox"/>	36	0

Cases - Weight Continuous variables **Marginal distributions** Outputs by categories Parameters Graphics

Ok Cancel

The active tab is here : *Marginal distributions*.
Select variables to be described.
Then select the *Parameters* tab.



Standard statistics

Selecting parameters

Do not forget to check "No" regarding Missing data and Categories with null weight.

For continuous variables select the descriptive statistics you want.

Standard statistics

Categorical variables - Marginal distributions - Outputs by categories

Edit the category "Missing data" Yes No Edit the row "Overall" for each variable Yes No

Edit the categories with null weight Yes No Also edit the non-weighted statistics if you use a weight Yes No

Sorted editing for outputs by categories Yes No

Statistics for continuous variables

Statistic	Computed	Index
Count/Weight	<input checked="" type="checkbox"/>	1
Mean	<input checked="" type="checkbox"/>	2
Standard deviation (N)	<input checked="" type="checkbox"/>	3
Min, Max	<input checked="" type="checkbox"/>	4
Standard deviation (N-1)	<input checked="" type="checkbox"/>	5
Min2, Max2	<input type="checkbox"/>	6
----- New table -----		
Sum	<input type="checkbox"/>	1
Variation coefficient	<input type="checkbox"/>	2
Relative Standard deviation (RSD)	<input type="checkbox"/>	3
Median	<input type="checkbox"/>	4

Maximum number of values for the discretization

Also edit the non-weighted statistics if you use a weight Yes No

Correlations matrix

Missing data management

Advanced options

Cases - Weight / Continuous variables / Marginal distributions / Outputs by categories / Parameters / Graphics

Ok Cancel



Standard statistics

Looking at the results

The screenshot shows the 'Analyses' software interface. A workflow is visible with two nodes: 'LEISURE' (represented by a red document icon) and 'Standard s' (represented by a green bar chart icon). Both nodes have a green checkmark icon in the top right corner, indicating successful execution. A context menu is open over the 'Standard s' node, showing options such as 'Parameters', 'Cancel the execution', 'Execute', 'Results', 'Copy', 'Paste', 'Add/Insert a method', 'Rename', and 'Delete'. The 'Results' option is highlighted, and a 'Report' button is visible next to it. Below the workflow, a table displays the results of the analysis.

Index	ID	More time	Going out	NewsPaper	TV with	Channel-01	Channel-02	TPTVH	How many ...	How
1	1	NoLackFree...	Going out:p...	everyday	TV with:so...	TF1	France3	15	6	
2	3	home DIY	Going out:p...	< once/week	TV with:dep...	TF1	M6	81	5	
3	4	develop kn...	Going out:f...	< once/week	TV with:dep...	M6	TF1	14	20	
4	5	home DIY	Going out:g...	everyday	TV with:so...	zapping	0	19	3	
5	6	rest	Going out:f...	< once/week	TV with:dep...	Arte	Canal+	12	3	
6	7	home DIY	DontGoOut	everyday	TV with:dep...	TF1	France2	30	0	

Once the method has worked (green icon at the top right of the icon) right click and select Results and Report.

A spreadsheet will open and you will see the results.

To sum up : how to use SPAD

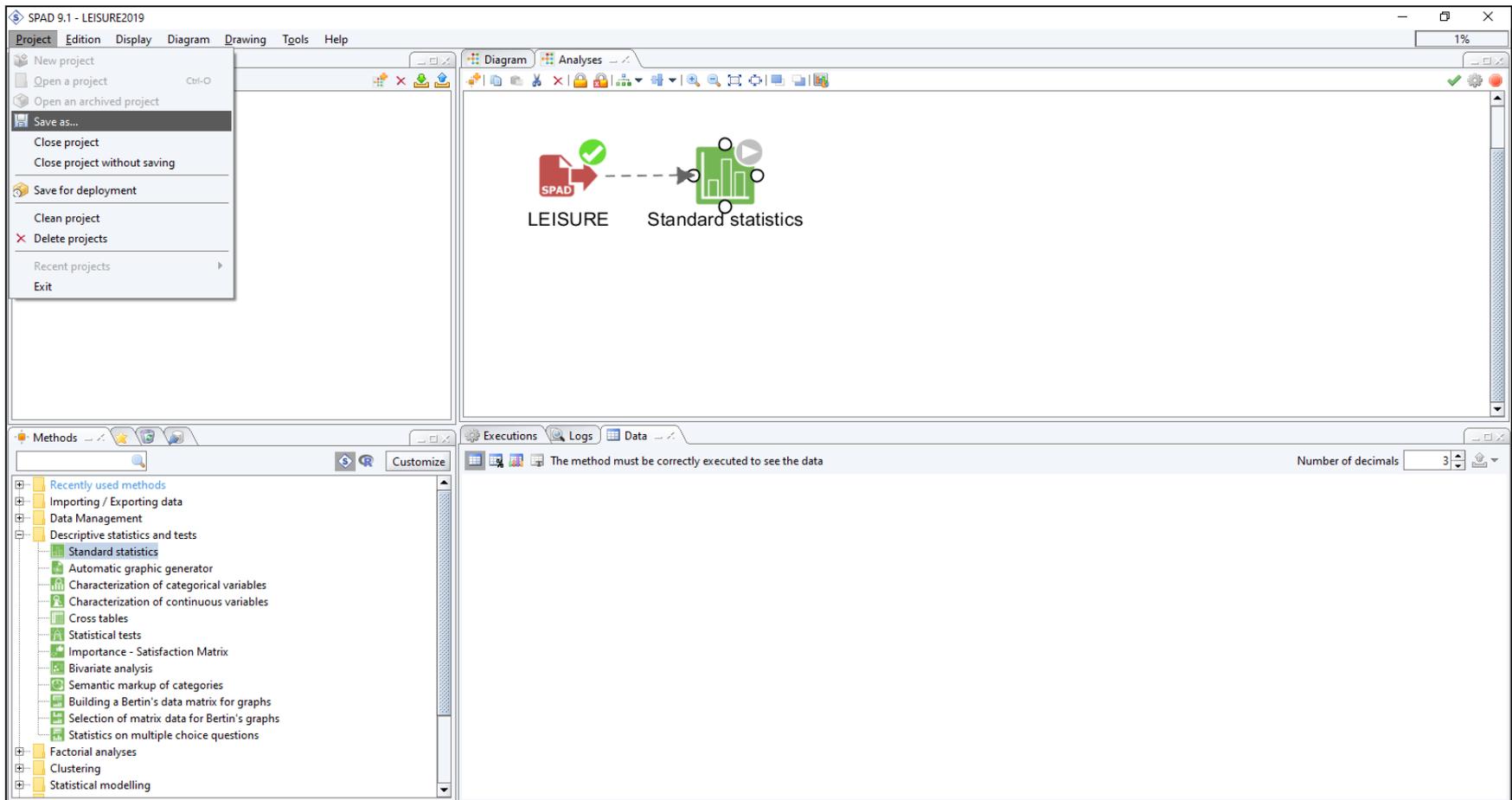
To apply a method

- select the wanted method in the Methods window and drop it in the Diagram window
 - Join this method to the preceding method if there is one
 - Right click to define parameters of the method
 - Then execute the method
 - Look at the results in the provided spreadsheet.
-
- Note : There are methods which have no results. This is the case for data management methods. It is still possible to verify if it had correctly worked by looking at the data in the bottom right window, Data sheet.

How to save a project

- Every time you quit SPAD all operations done are saved. When reopening SPAD you choose the project you worked on and you will find it as it was. You can also save a project as an "archived project". An "archived project" can be sent to anyone. But it can only be opened with SPAD.
- In the following slides is the way to save an archived project and to open an archived project. Every archived project has a name with **.spad** as extension.
- There is also a simple copy option of a project. It is rather for internal use.

Saving a project as an "archived project"



Click on "Project" and choose *Save as...* in the drop-down menu

Saving a project as an "archived project"

Save as

Select the saving mode and the corresponding path

Type of saving and path

Project's archive G:\SPAD\SPAD9-1_Mes projets\LEISURE2019_2019_08_12.spad ...

Project copy G:\SPAD\SPAD9-1_Mes projets ...

Name for the project copy Copy_LEISURE2019

Additional parameters

Do not include data (diagram will have to be reexecuted)

Include data Lock the importation methods

OK Cancel

By default, it is a project's archive (verify directory); by default, it will be saved in "My projects" directory. Name of the project can be changed. Then there is the choice between including or not data. If data are non included all methods are to be re-executed. Do not forget to provide data when sending the archived project.

Saving a project as an "archived project "

Save as

Select the saving mode and the corresponding path

Type of saving and path

Project's archive G:\SPAD\SPAD9-1_Mes projets\LEISURE2019_2019_08_12.spad ...

Project copy G:\SPAD\SPAD9-1_Mes projets ...

Name for the project copy Copy_LEISURE2019

Additional parameters

Do not include data (diagram will have to be reexecuted)

Include data Lock the importation methods

OK Cancel

If data are included there are two possibilities: lock importation methods or not. If locking the data, importation is blocked and cannot be executed. But data are in the project and the following methods are configurable and executable. If no locking, the project is open as the original project that has been archived.

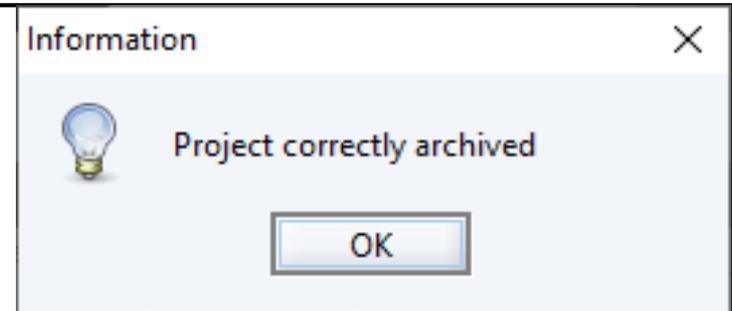
Saving a project as an "archived project"

Once options have been chosen, click on OK.
Here is what must appear as a result.

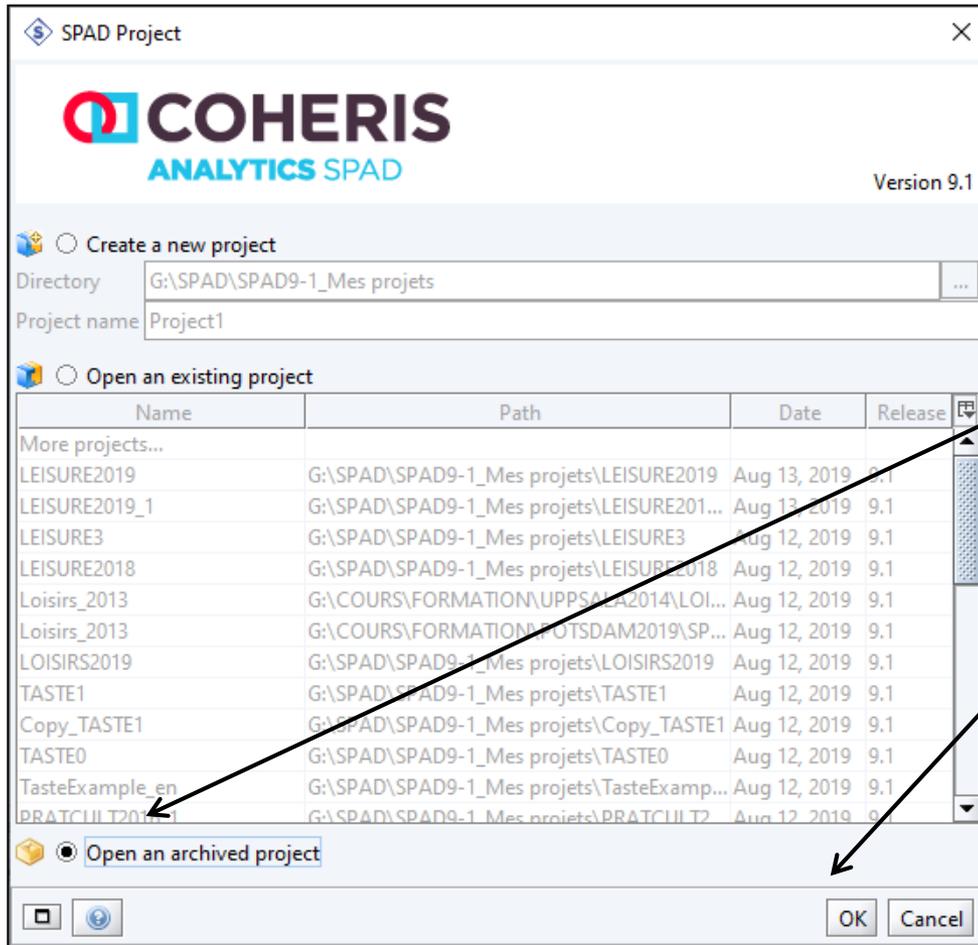
You can quit SPAD.

Note : by default the archived project has the same name as the current project followed by the current date and with ".spad" as an extension.

For instance here : LEISURE2022_2022_09_12.spad



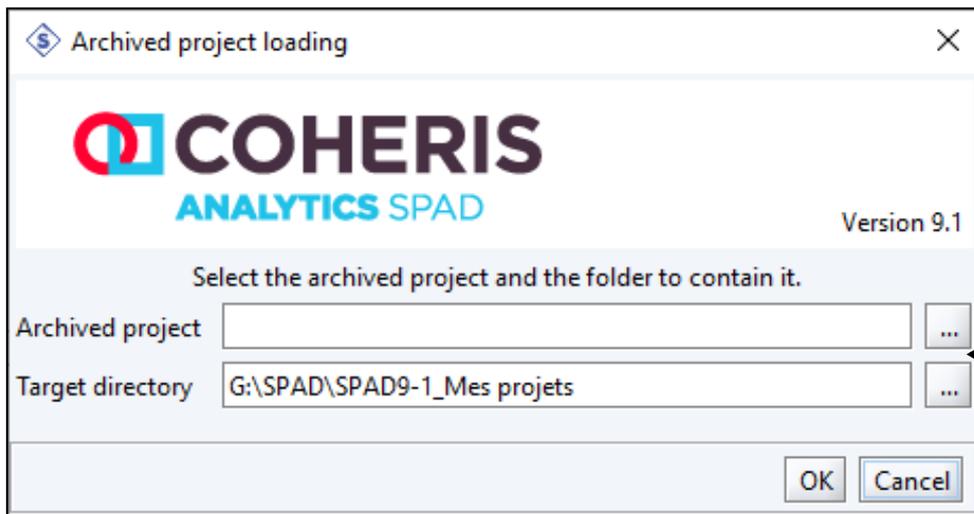
Opening an "archived project"



Here is the case of opening a archived project with data included and importation method locked.

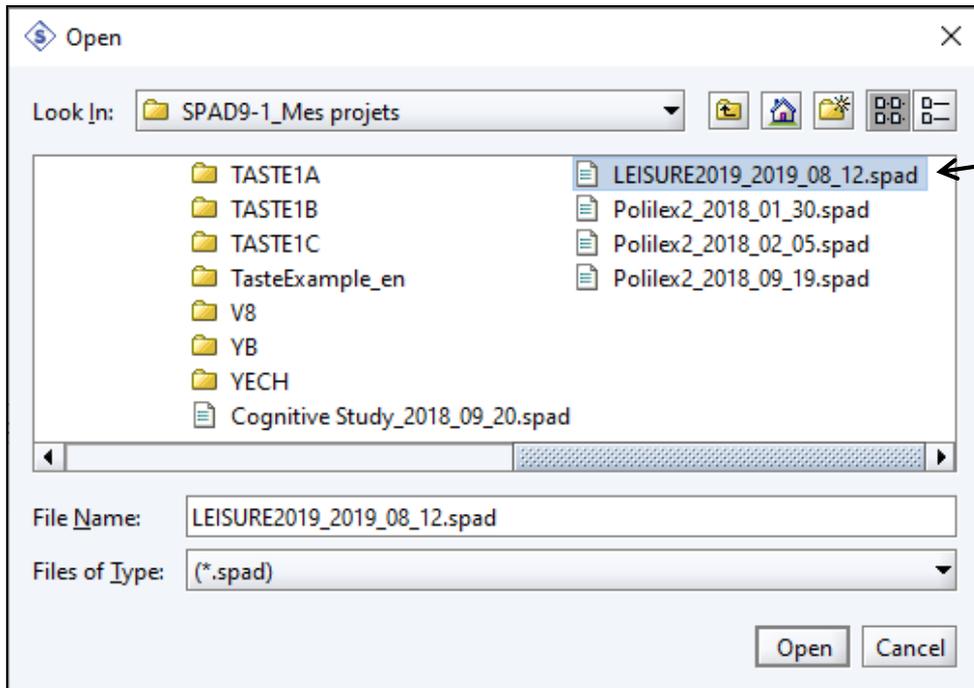
When opening SPAD select "Open an archived project"

then OK



Opening an "archived project"

First window : you have to provide the name of the archived project by clicking on the 3 points button.



Second window : click the name of the file you want to open.

Opening an "archived project"

Going back to the first window. The name of the archived project appears in the line named "Archived project".

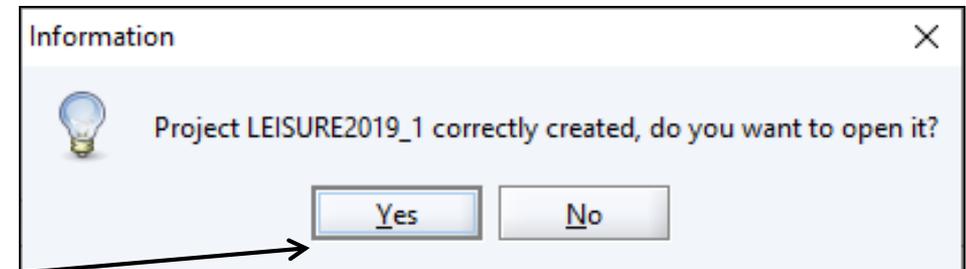
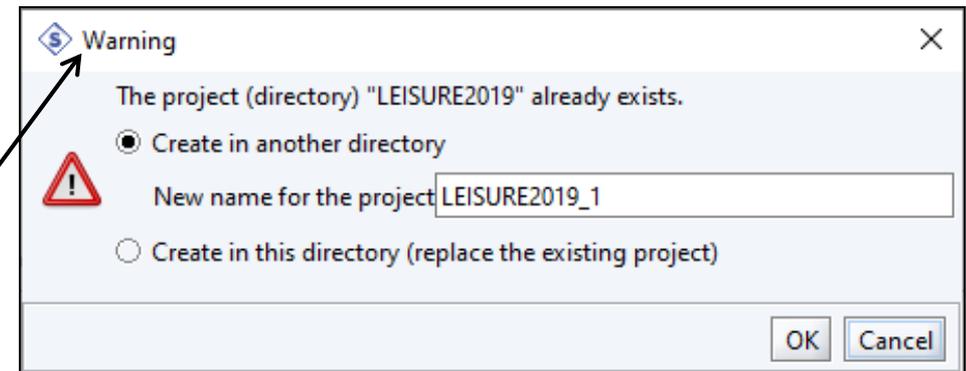
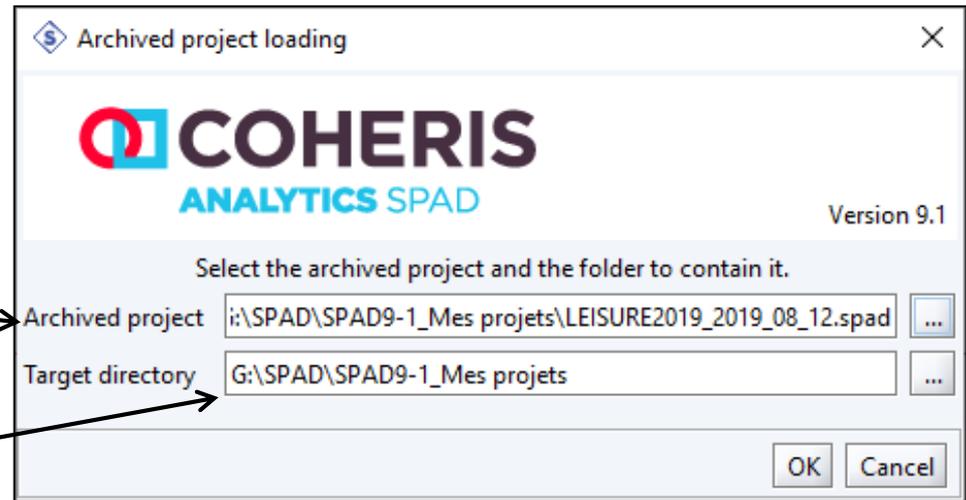
Check the name of the target directory, that is the directory where the project will be opened.

By default, it will be "My projects".

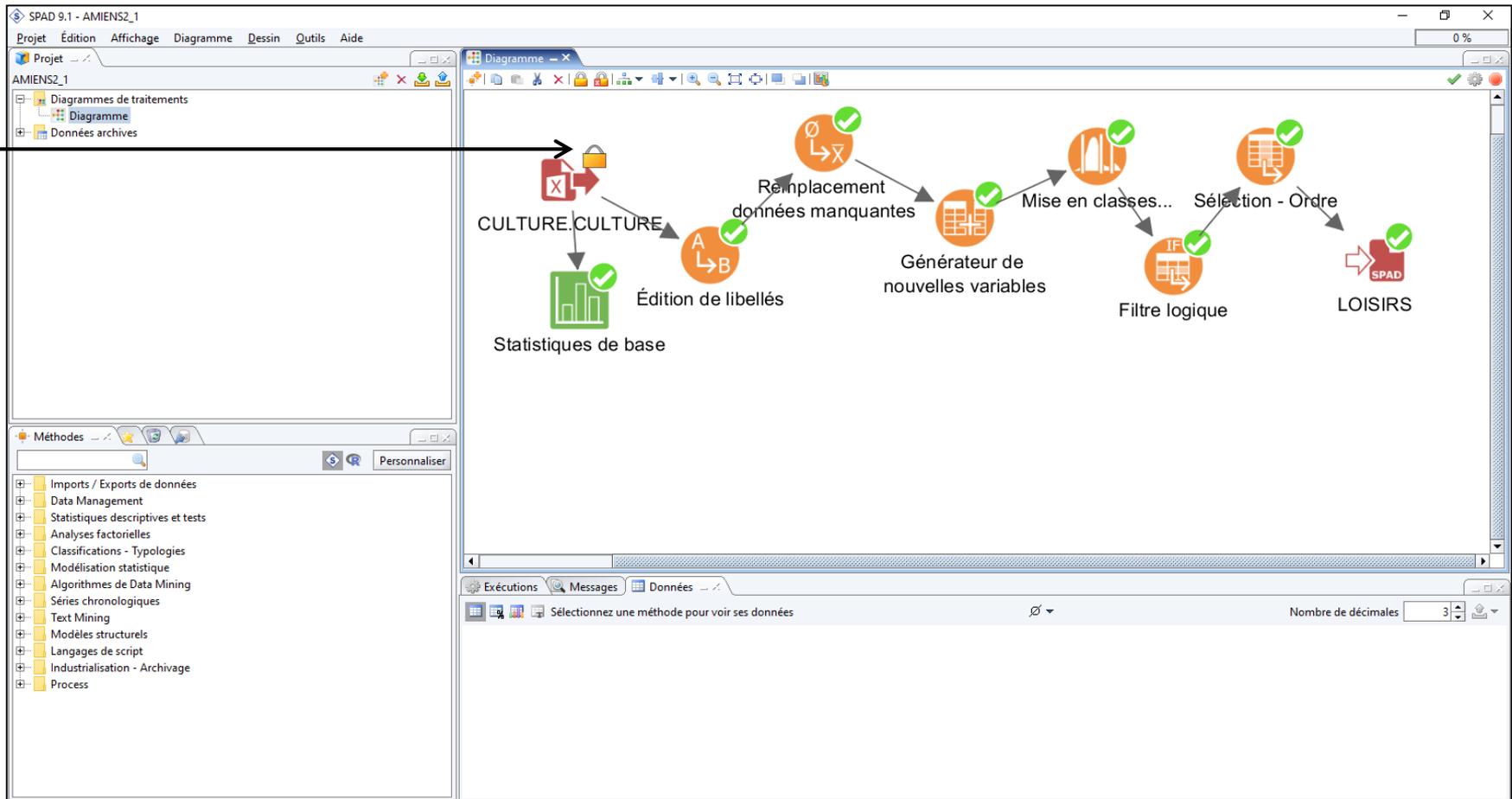
To create a project based on a archived project, SPAD creates a directory the name of which is the name of the archived project. If the name has not been changed there will be duplication thereby leading to this warning.

But SPAD will add un number to distinguish this new project from the original one.

Last, SPAD will ask if this project is to be opened.



Opening an "archived project"



Project is opened and appears in the top right window.

Note: all methods have a green icon on top right which means there are all properly executed. But the importation method has a closed padlock icon meaning it is locked

Thank you for your attention

