



# **Unit 1: Meaning and representation of a vector**

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## Learning objectives

By the end of this unit, you should be able to:

1. Explain what SPSS is all about
2. Outline the basic structure of SPSS
3. Perform descriptive statistics using SPSS
4. representing, analysing and interpreting data entered into SPSS
5. use other ICT tools such as excel to representing, analysing and interpreting data explain the meaning of the term *vector*;



# Introduction to SPSS





# Topics we will cover today

- SPSS at a glance
- Basic Structure of SPSS
- Descriptive Statistics
- The basic analysis in SPSS



# Introduction: What is SPSS?

- Originally it is an acronym of Statistical Package for the Social Science but now it stands for Statistical Product and Service Solutions
- One of the most popular statistical packages which can perform highly complex data manipulation and analysis with simple instructions



# Example

- Used by e.g. retail and consumer product companies
- Trying to learn about and describe their customers' buying habits, gender, age, income level, etc.
- These companies tailor their marketing and product development strategies to each consumer group to increase sales and build brand loyalty.
- A valuable approach in Market Research, and SPSS offers some useful tools to facilitate this commercial process



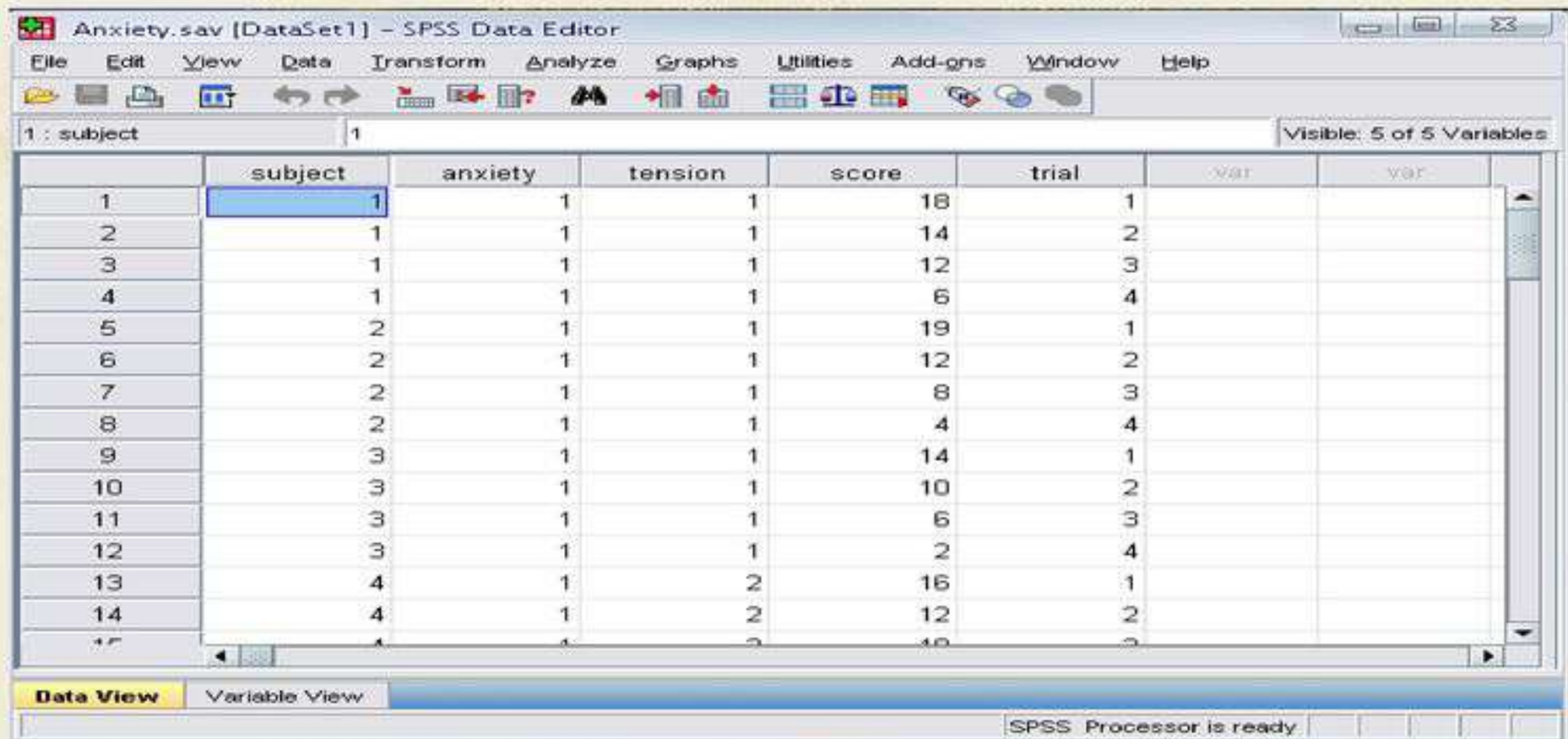
# Basic structure of SPSS

- There are two different windows in SPSS
- 1<sup>st</sup> – Data Editor Window - shows data in two forms
  - Data view
  - Variable view
- 2<sup>nd</sup> – Output viewer Window – shows results of data analysis
- \*You must save the data editor window and output viewer window separately. Make sure to save both if you want to save your changes in data or analysis.\*

# The two Windows: Data Editor

- Data Editor

Spreadsheet-like system for defining, entering, editing, and displaying data. Extension of the saved file will be “sav.”



The screenshot shows the SPSS Data Editor window for a file named 'Anxiety.sav'. The window displays a data table with 15 rows and 7 columns. The columns are labeled 'subject', 'anxiety', 'tension', 'score', 'trial', 'var', and 'var'. The data is as follows:

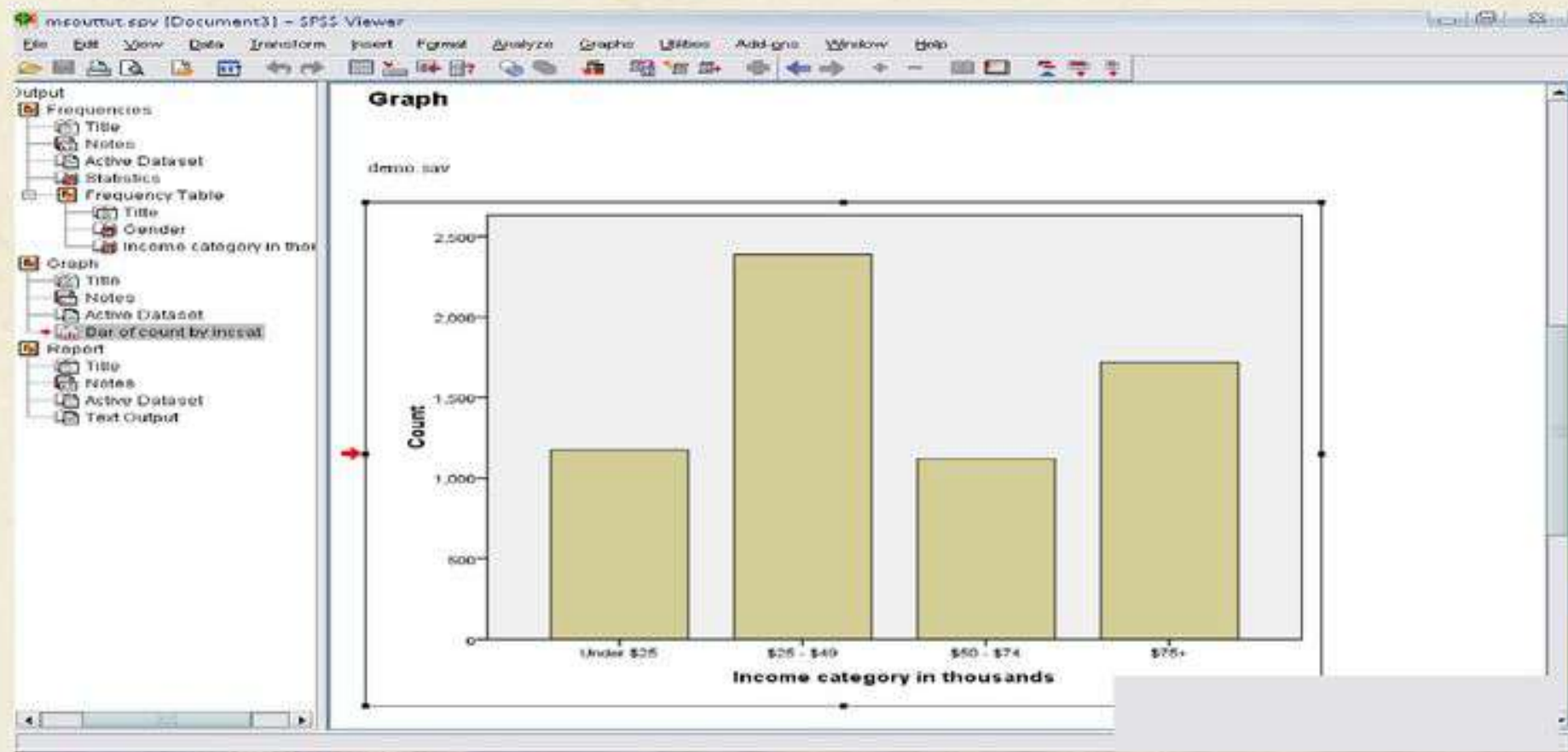
	subject	anxiety	tension	score	trial	var	var
1	1	1	1	18	1		
2	1	1	1	14	2		
3	1	1	1	12	3		
4	1	1	1	6	4		
5	2	1	1	19	1		
6	2	1	1	12	2		
7	2	1	1	8	3		
8	2	1	1	4	4		
9	3	1	1	14	1		
10	3	1	1	10	2		
11	3	1	1	6	3		
12	3	1	1	2	4		
13	4	1	2	16	1		
14	4	1	2	12	2		
15	4	1	2	10	3		

The window also shows a menu bar (File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Add-ons, Window, Help) and a toolbar with various icons. The status bar at the bottom indicates 'SPSS Processor is ready'.



# The two Windows: Output Viewer

- Output Viewer  
Displays output and errors. Extension of the saved file will be “spv.”





# The basics of managing data files

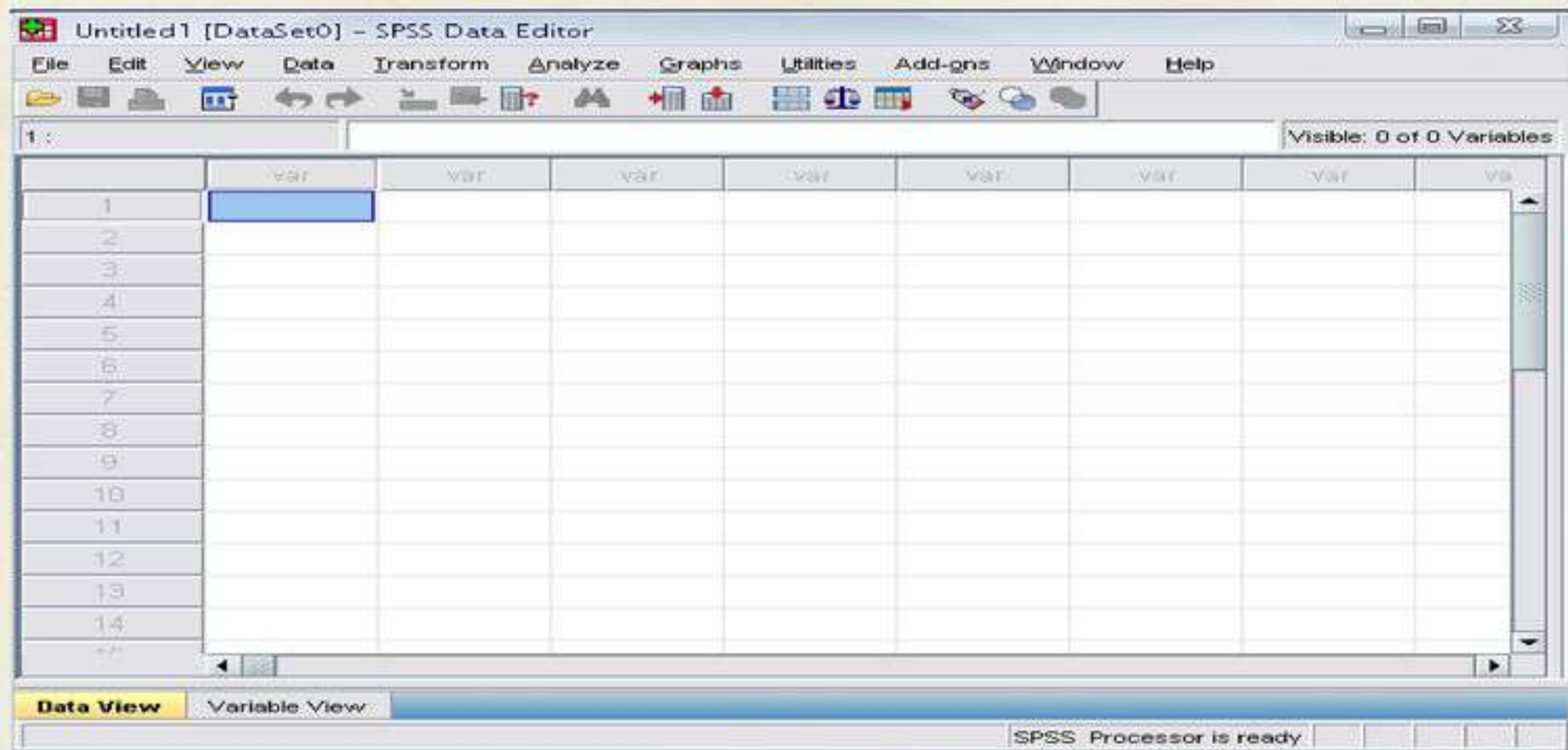
# Opening SPSS

- Start → All Programs → SPSS Inc → SPSS 17.0 → SPSS 17.0



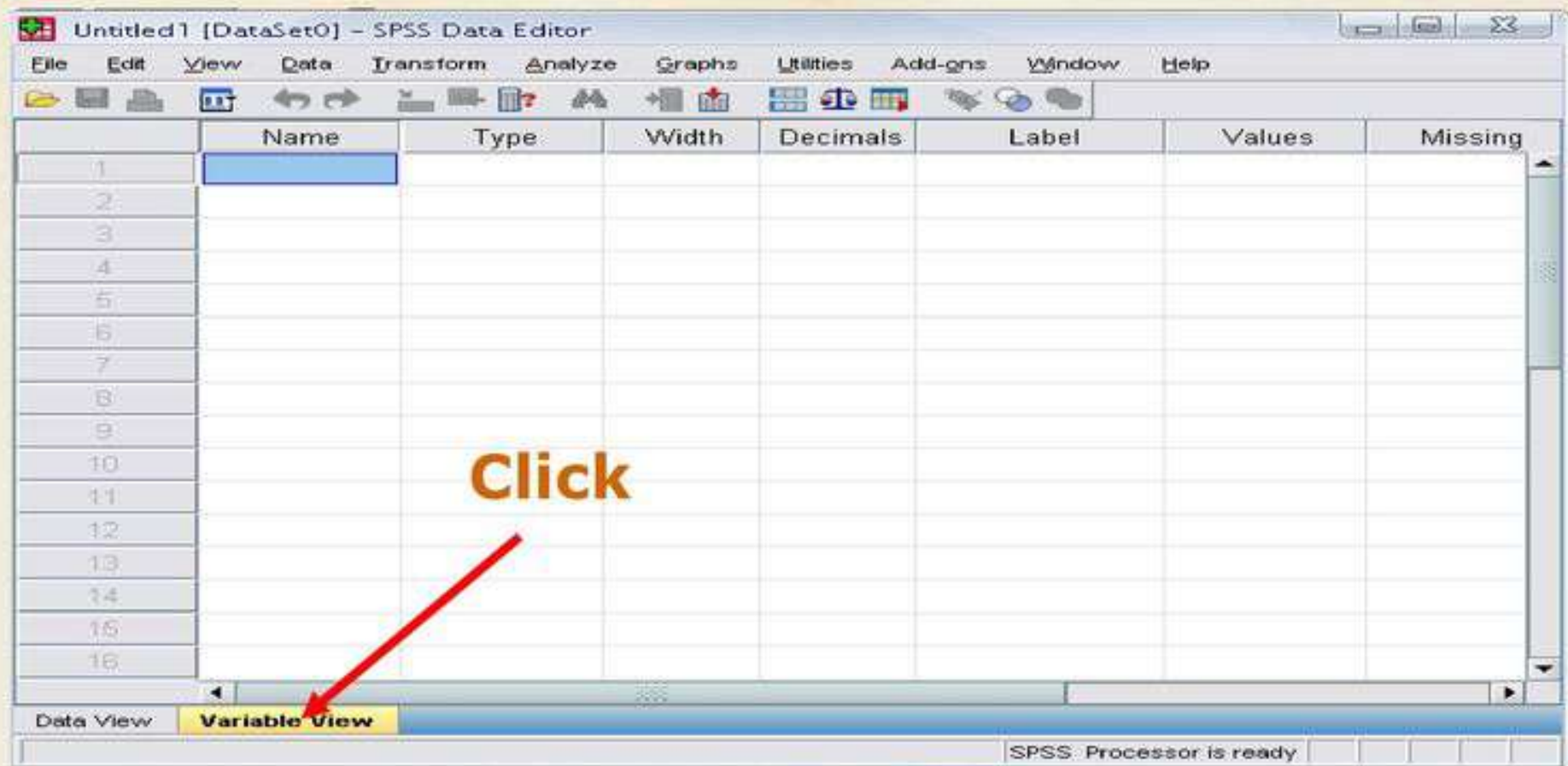
# Opening SPSS

- The default window will have the data editor
- There are two sheets in the window:
  1. Data view
  2. Variable view



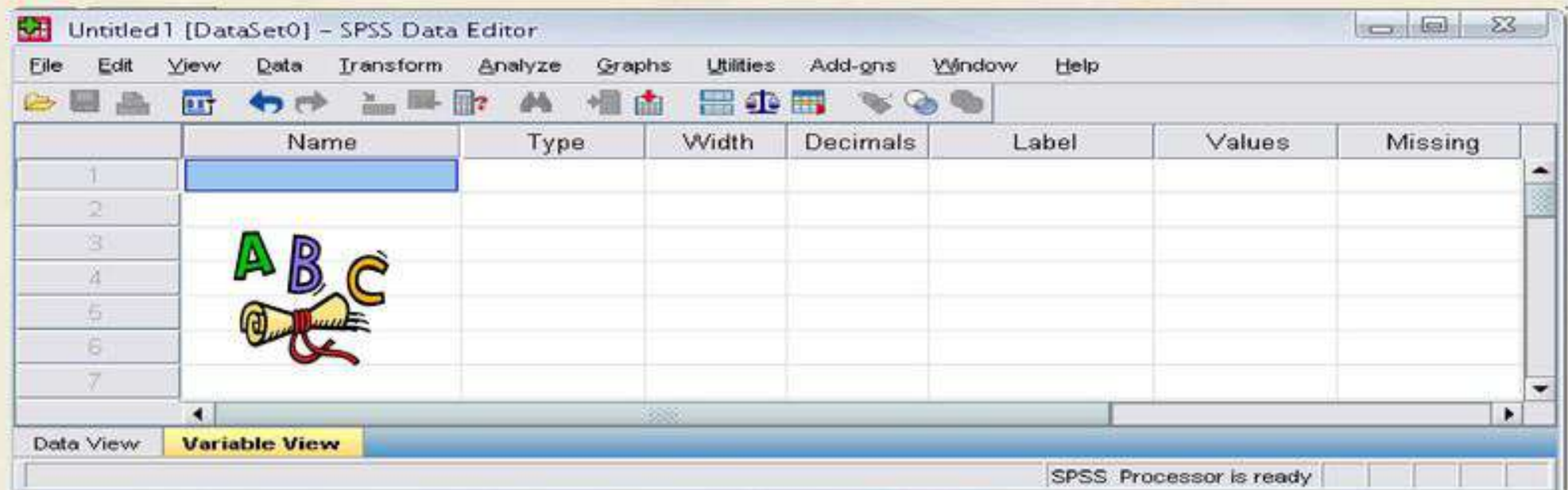
# Data View window

- The Data View window  
This sheet is visible when you first open the Data Editor and this sheet contains the data
- Click on the tab labeled Variable View



# Variable View window

- This sheet contains information about the data set that is stored with the dataset
- Name
  - The first character of the variable name must be alphabetic
  - Variable names must be unique, and have to be less than 64 characters.
  - Spaces are NOT allowed.





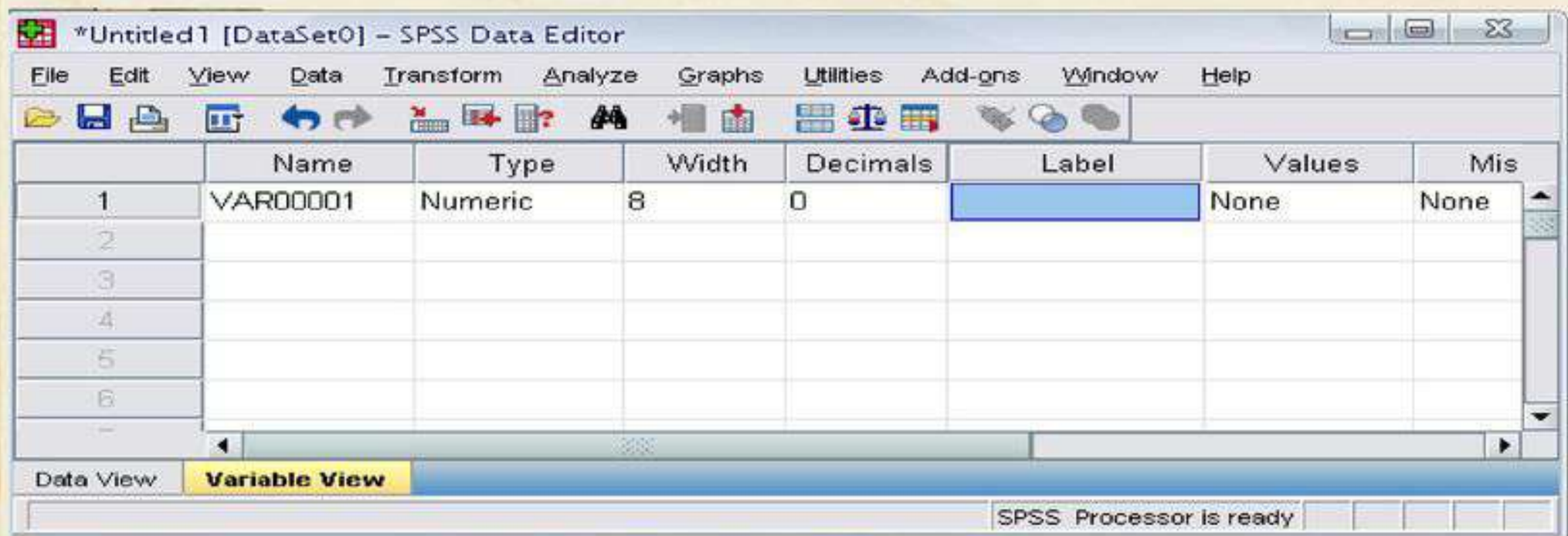






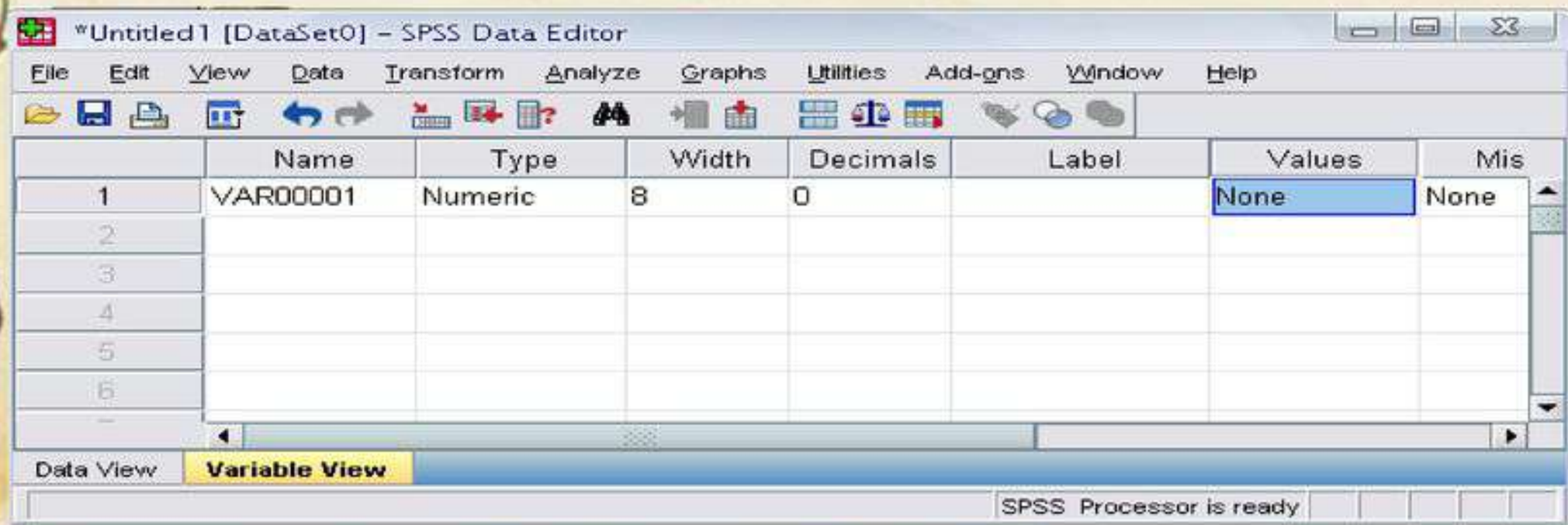
# Variable View window: Label

- Label
  - You can specify the details of the variable
  - You can write characters with spaces up to 256 characters



# Variable View window: Values

- Values
  - This is used and to suggest which numbers represent which categories when the variable represents a category

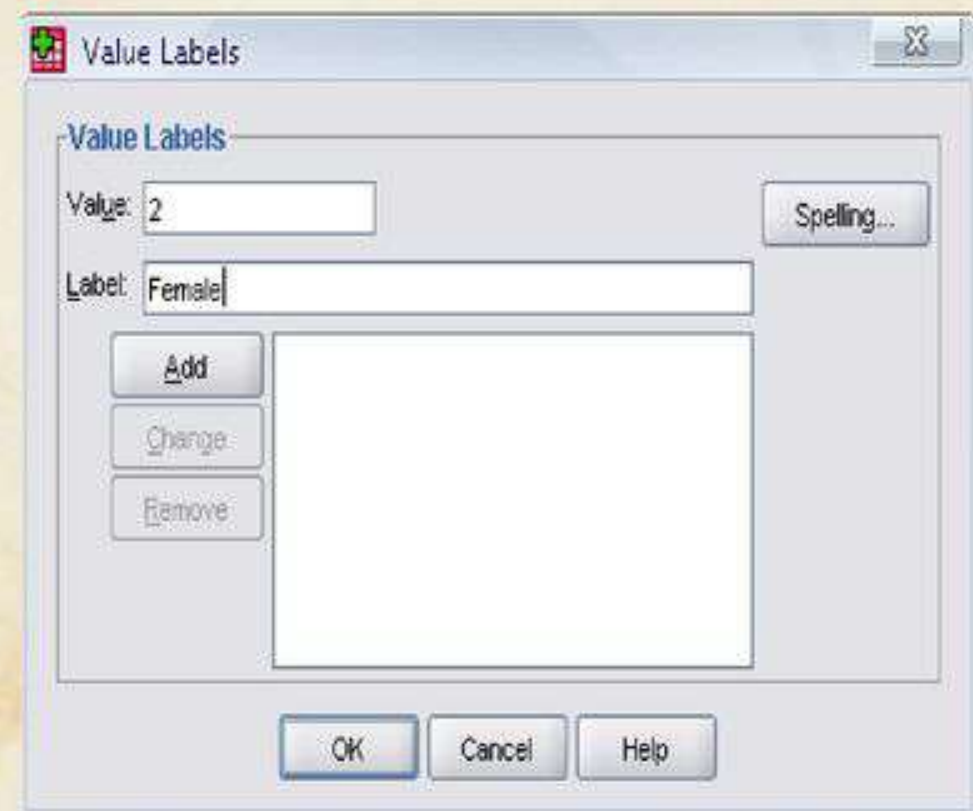
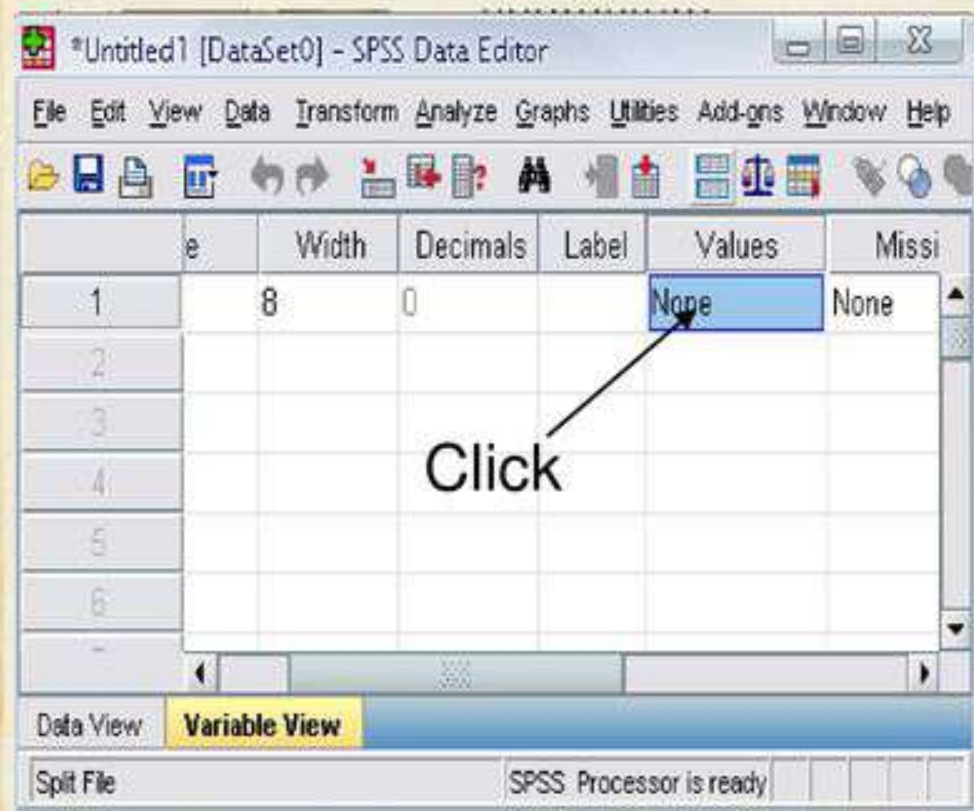


The screenshot shows the SPSS Data Editor window in Variable View. The window title is '\*Untitled1 [DataSet0] - SPSS Data Editor'. The menu bar includes File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains various icons for file operations and data manipulation. The main area is a table with columns: Name, Type, Width, Decimals, Label, Values, and Mis. The first row is selected, showing variable VAR00001 with a Numeric type, width of 8, and 0 decimals. The 'Values' column for this variable is set to 'None'. The 'Mis' column is also set to 'None'. The status bar at the bottom indicates 'SPSS Processor is ready'.

	Name	Type	Width	Decimals	Label	Values	Mis
1	VAR00001	Numeric	8	0		None	None
2							
3							
4							
5							
6							

# Defining the value labels

- Click the cell in the values column as shown below
- For the value, and the label, you can put up to 60 characters.
- After defining the values click add and then click OK.



# Data view vs. Variable view

- Data view
  - Rows are cases
  - Columns are variables
- Variable view
  - Rows define the variables
    - Name, Type, Width, Decimals, Label, Missing, etc.
      - Scale – age, weight, income
      - Nominal – categories that cannot be ranked (ID number)
      - Ordinal – categories that can be ranked (level of satisfaction)

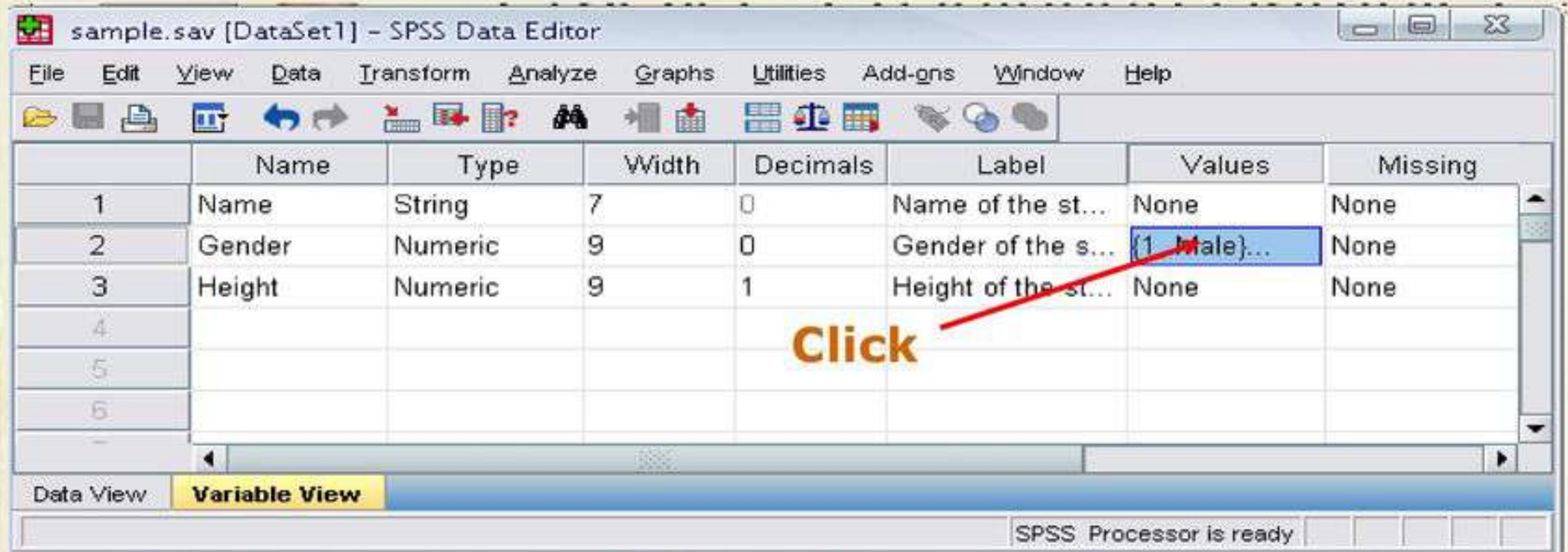
# Practice 1

- How would you put the following information into SPSS?

<b>Name</b>	<b>Gender</b>	<b>Height</b>
JAUNITA	2	5.4
SALLY	2	5.3
DONNA	2	5.6
SABRINA	2	5.7
JOHN	1	5.7
MARK	1	6
ERIC	1	6.4
BRUCE	1	5.9

Value = 1 represents Male and Value = 2 represents Female

# Practice 1 (Solution Sample)



sample.sav [DataSet1] - SPSS Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

	Name	Type	Width	Decimals	Label	Values	Missing
1	Name	String	7	0	Name of the st...	None	None
2	Gender	Numeric	9	0	Gender of the s...	{1 = Male}...	None
3	Height	Numeric	9	1	Height of the st...	None	None
4							
5							
6							

Click

Data View Variable View

SPSS Processor is ready



Value Labels

Value Labels

Value:

Label:

Add Change Remove

1 = "Male"  
2 = "Female"

Spelling...

OK Cancel Help

sample.sav [DataSet1] - SPSS Data Editor

File Edit View Data Transform Analyze **Graphs** Utilities Add-ons Window Help

	Name	Type	Width	Decimals	Label	Values	Missing
1	Name	String	7	0	Name of the st...	None	None
2	Gender	Numeric	9	0	Gender of the s...	{1, Male}...	None
3	Height	Numeric	9	1	Height of the st...	None	None
4							
5							
6							
-							

Data View **Variable View**

SPSS Processor is ready

sample.sav [DataSet1] - SPSS Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

1 : Name JAUNITA Visible: 3 of 3 Variables

	Name	Gender	Height	var	var
1	JAUNITA	2	5.4		
2	SALLY	2	5.3		
3	DONNA	2	5.6		
4	SABRINA	2	5.7		
5	JOHN	1	5.7		
6	MARK	1	6.0		
7	ERIC	1	6.4		
8	BRUCE	1	5.9		

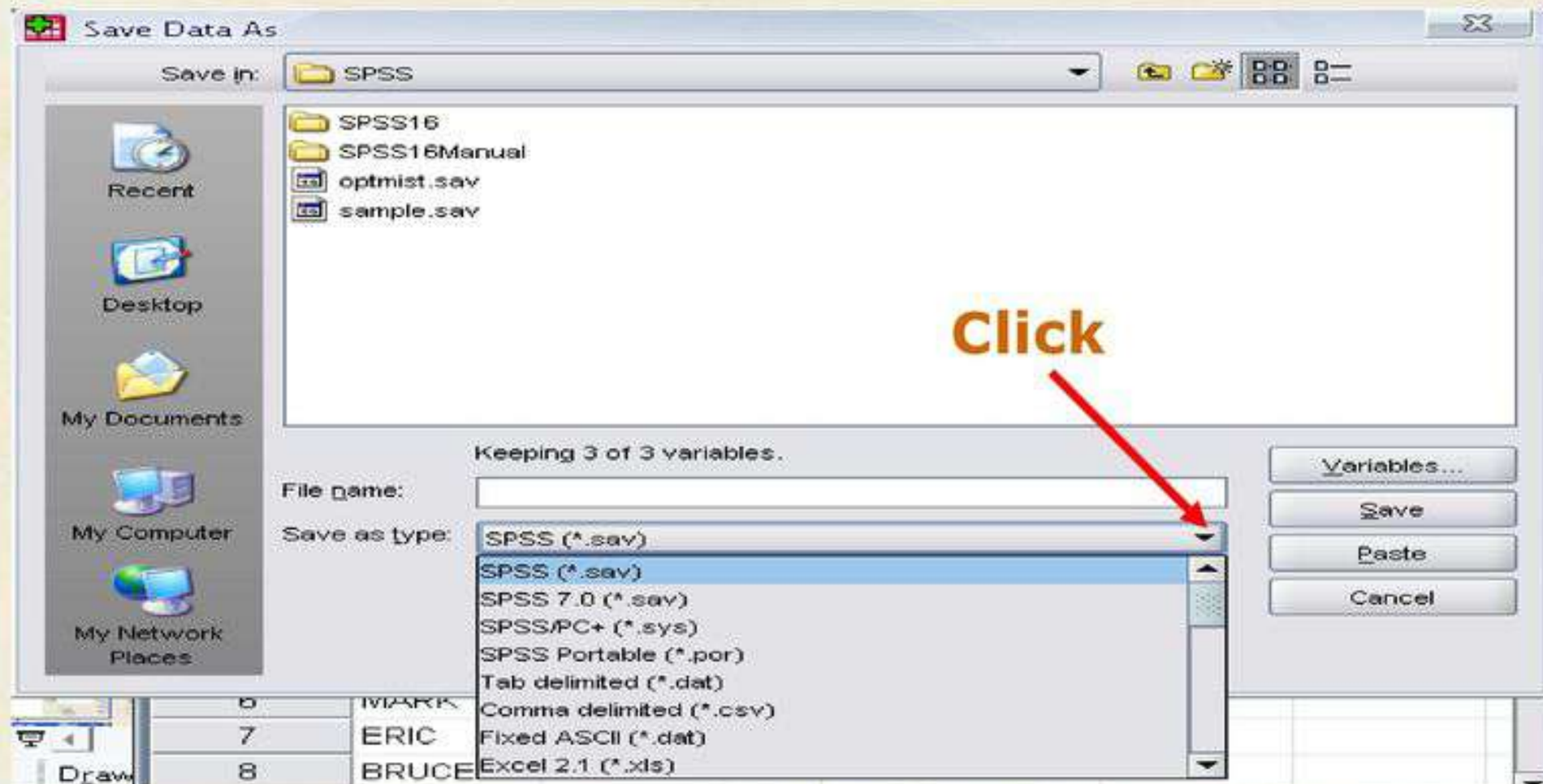
**Data View** Variable View

Weight status area SPSS Processor is ready



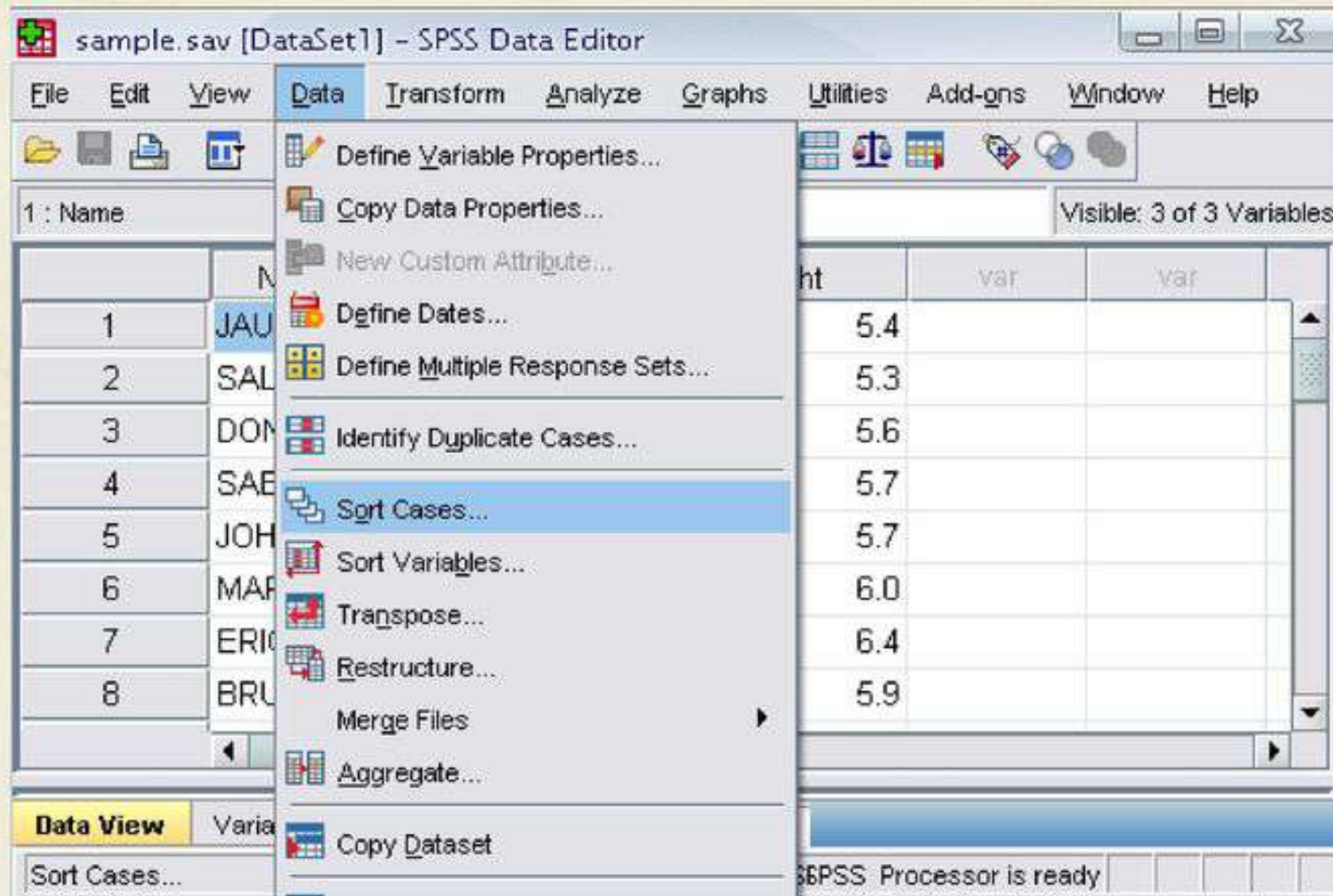
# Saving the data

- To save the data file you created simply click 'file' and click 'save as.' You can save the file in different forms by clicking "Save as type."



# Sorting the data

- Click 'Data' and then click Sort Cases

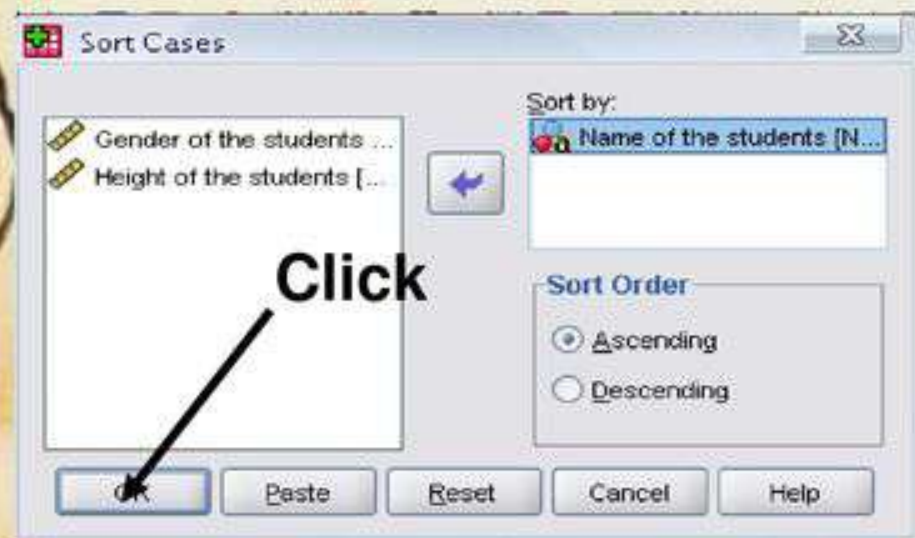
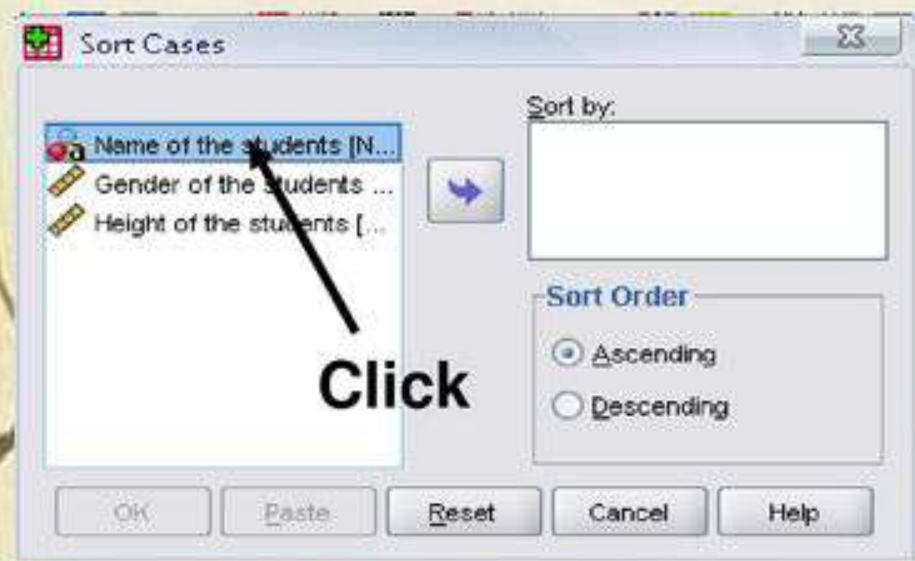


The screenshot shows the SPSS Data Editor window for a file named 'sample.sav'. The 'Data' menu is open, and 'Sort Cases...' is highlighted. The data view shows a list of names and their corresponding heights. The status bar at the bottom indicates 'SPSS Processor is ready'.

Case	Name	Height
1	JAU	5.4
2	SAL	5.3
3	DOM	5.6
4	SAE	5.7
5	JOH	5.7
6	MAP	6.0
7	ERIC	6.4
8	BRU	5.9

# Sorting the data (cont'd)

- Double Click 'Name of the students.' Then click ok.



\*sample.sav [DataSet1] - SPSS Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

1: Name BRUCE Visible: 3 of 3 Variables


	Name	Gender	Height	var	var
1	BRUCE	1	5.9		
2	DONNA	2	5.6		
3	ERIC	1	6.4		
4	JAUNITA	2	5.4		
5	JOHN	1	5.7		
6	MARK	1	6.0		
7	SABRINA	2	5.7		
8	SALLY	2	5.3		

Data View Variable View

SPSS Processor is ready



# The basic analysis

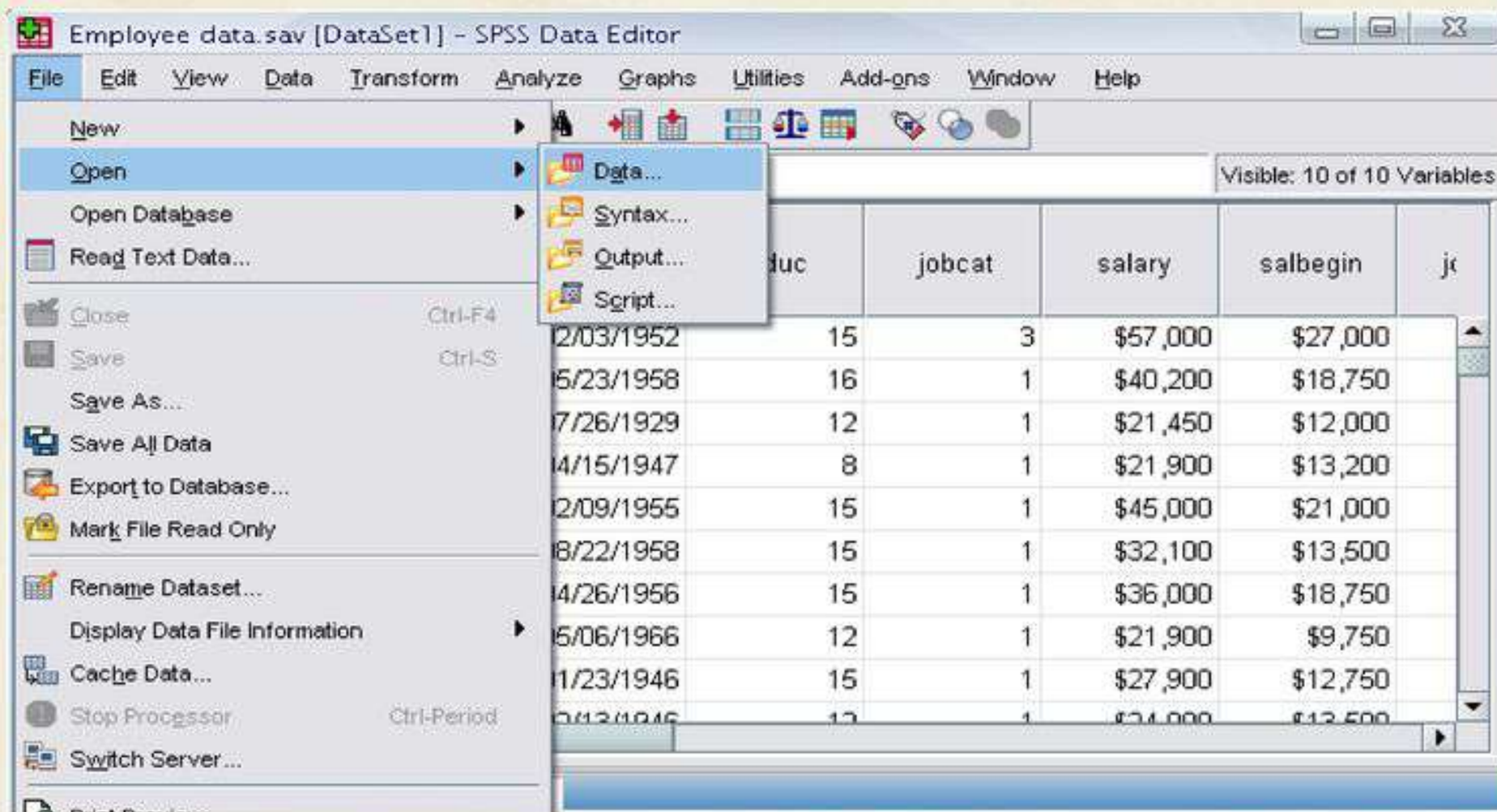


# The basic analysis of SPSS that will be introduced in this class

- **Frequencies**
  - This analysis produces frequency tables showing frequency counts and percentages of the values of individual variables.
- **Descriptives**
  - This analysis shows the maximum, minimum, mean, and standard deviation of the variables
- **Linear regression analysis**
  - Linear Regression estimates the coefficients of the linear equation

# Opening the sample data

- Open 'Employee data.sav' from the SPSS
  - Go to "File," "Open," and Click Data

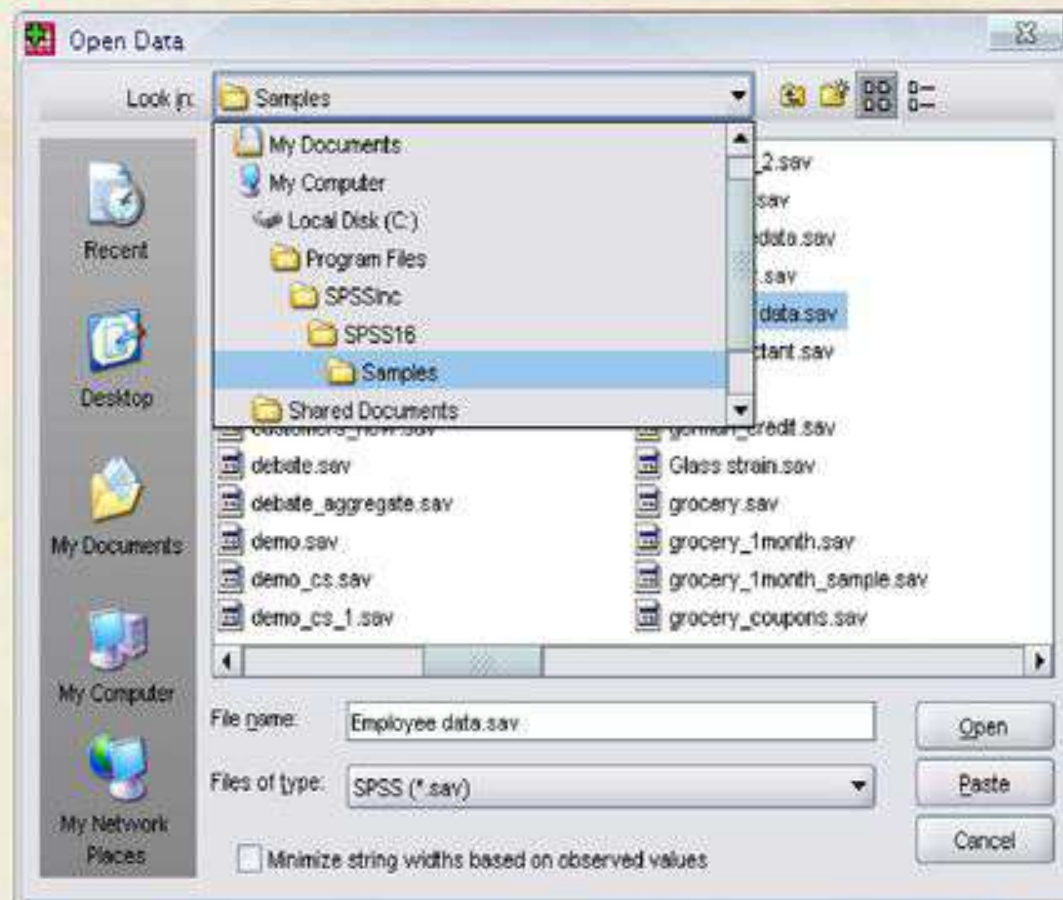


The screenshot shows the SPSS Data Editor window titled 'Employee data.sav [DataSet1] - SPSS Data Editor'. The 'File' menu is open, and the 'Open' option is selected, which has opened a sub-menu where 'Data...' is highlighted. The main window displays a data table with the following columns: 'date', 'educ', 'jobcat', 'salary', 'salbegin', and 'jc'. The data rows are as follows:

date	educ	jobcat	salary	salbegin	jc
2/03/1952	15	3	\$57,000	\$27,000	
5/23/1958	16	1	\$40,200	\$18,750	
7/26/1929	12	1	\$21,450	\$12,000	
4/15/1947	8	1	\$21,900	\$13,200	
2/09/1955	15	1	\$45,000	\$21,000	
8/22/1958	15	1	\$32,100	\$13,500	
4/26/1956	15	1	\$36,000	\$18,750	
5/06/1966	12	1	\$21,900	\$9,750	
1/23/1946	15	1	\$27,900	\$12,750	
2/12/1946	12	1	\$24,000	\$12,500	

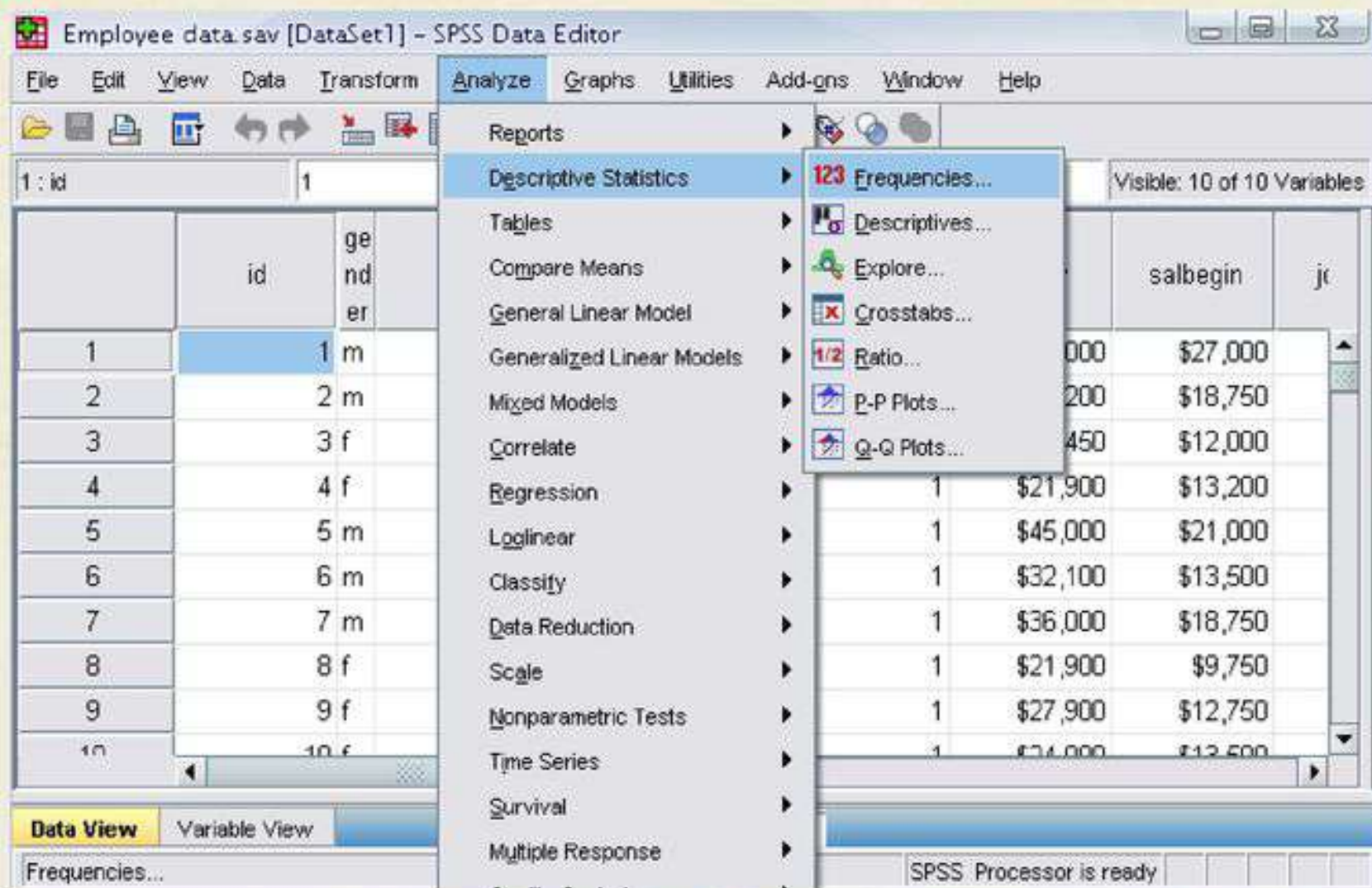
# Opening the sample data

- Go to Program Files,” “SPSSInc,” “SPSS17,” and “Samples” folder.
- Open “Employee Data.sav” file



# Frequencies

- Click 'Analyze,' 'Descriptive statistics,' then click 'Frequencies'



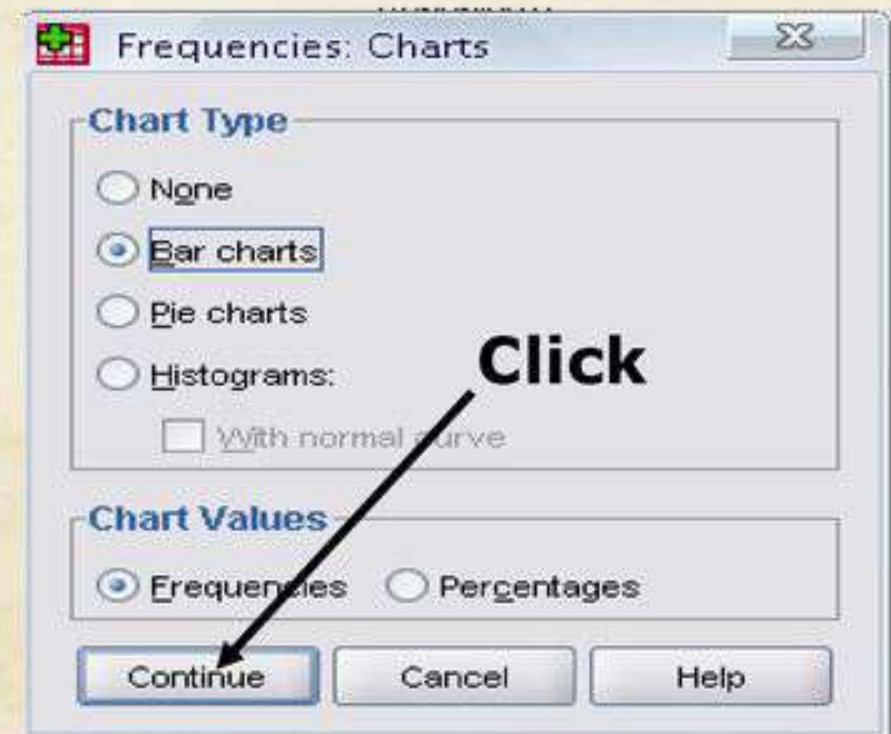
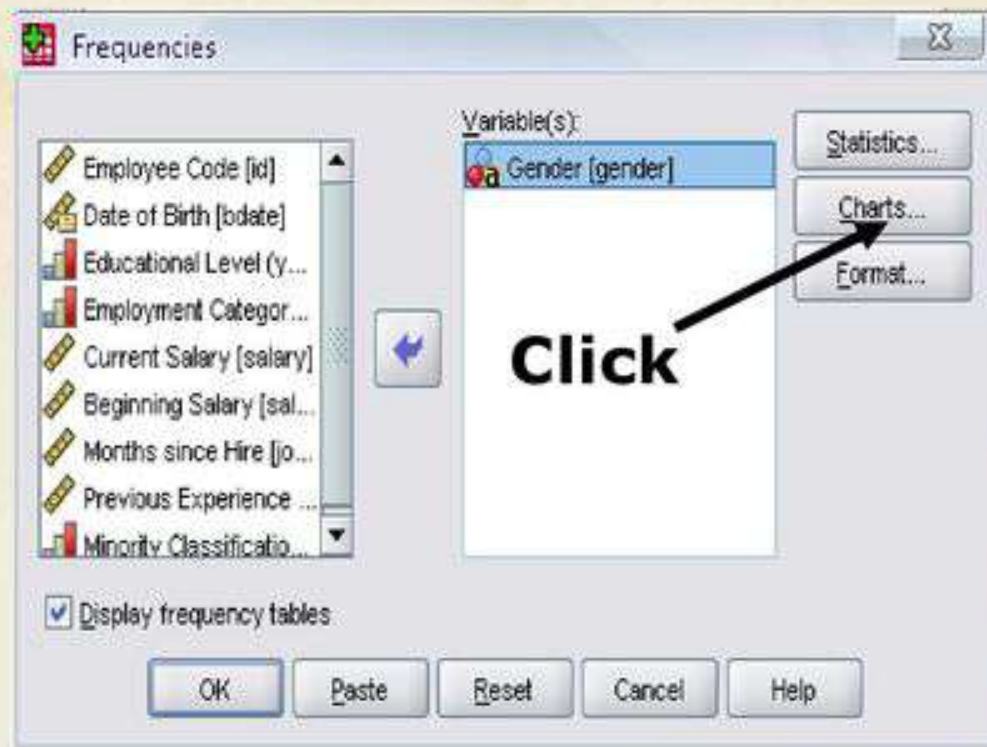
The screenshot shows the SPSS Data Editor window for 'Employee data.sav [DataSet1]'. The 'Analyze' menu is open, and 'Descriptive Statistics' is selected, with 'Frequencies...' highlighted. The data table below shows columns for 'id', 'gender', 'salbegin', and 'jt'.

	id	gender	salbegin	jt
1	1	m	21,900	13,200
2	2	m	45,000	21,000
3	3	f	32,100	13,500
4	4	f	36,000	18,750
5	5	m	21,900	9,750
6	6	m	27,900	12,750
7	7	m	24,000	13,500
8	8	f		
9	9	f		
10	10	f		



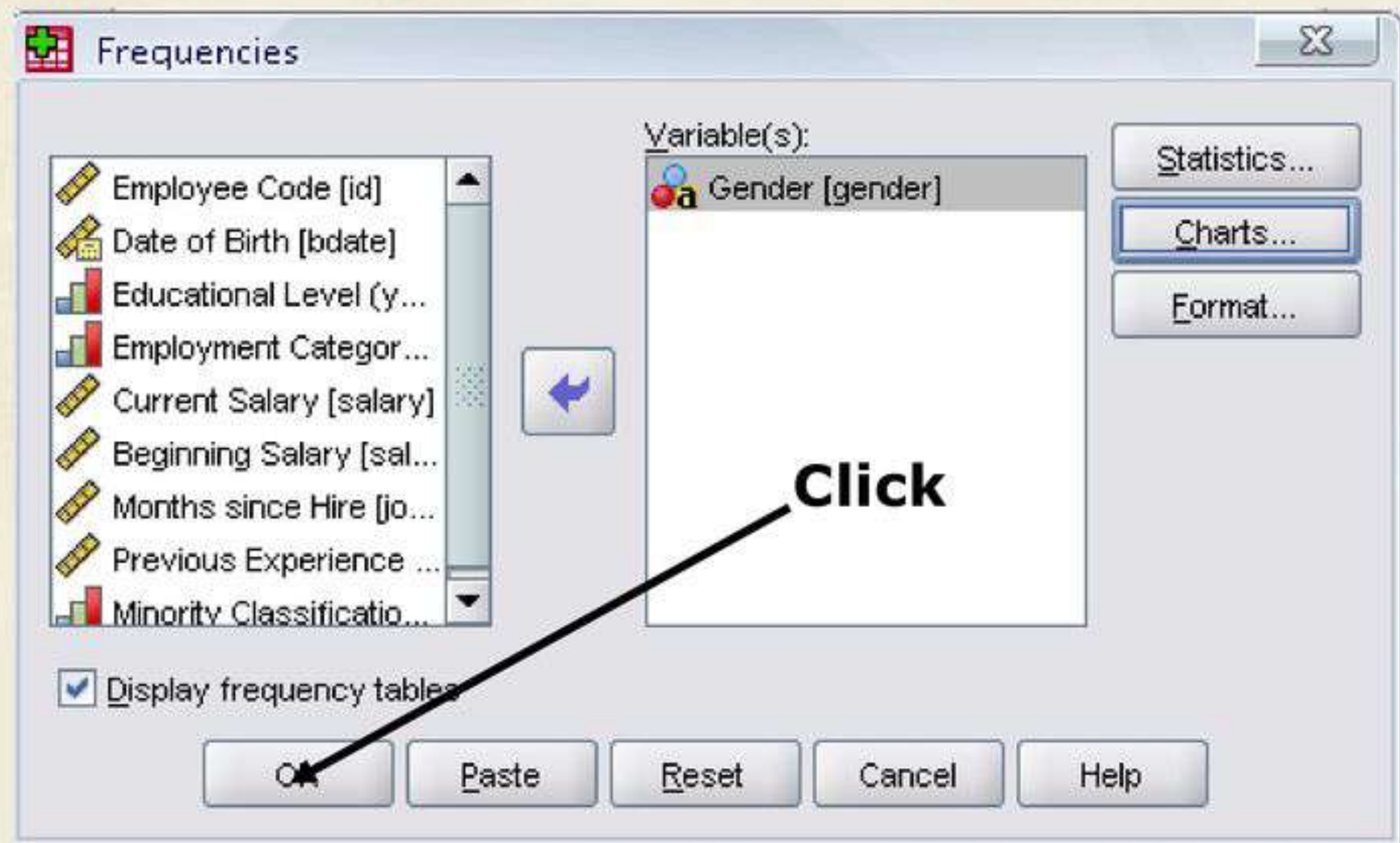
# Frequencies

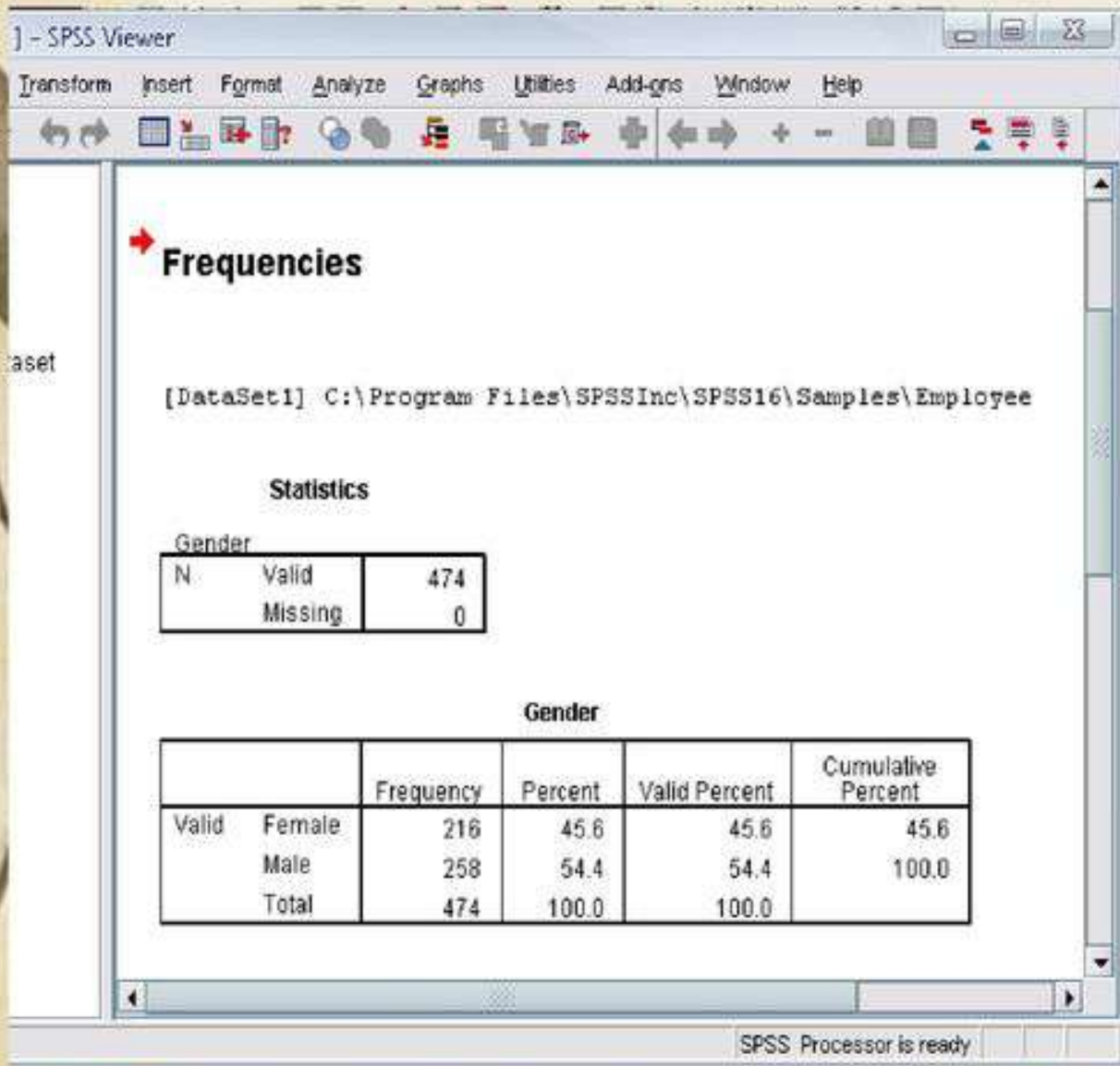
- Click gender and put it into the variable box.
- Click 'Charts.'
- Then click 'Bar charts' and click 'Continue.'



# Frequencies

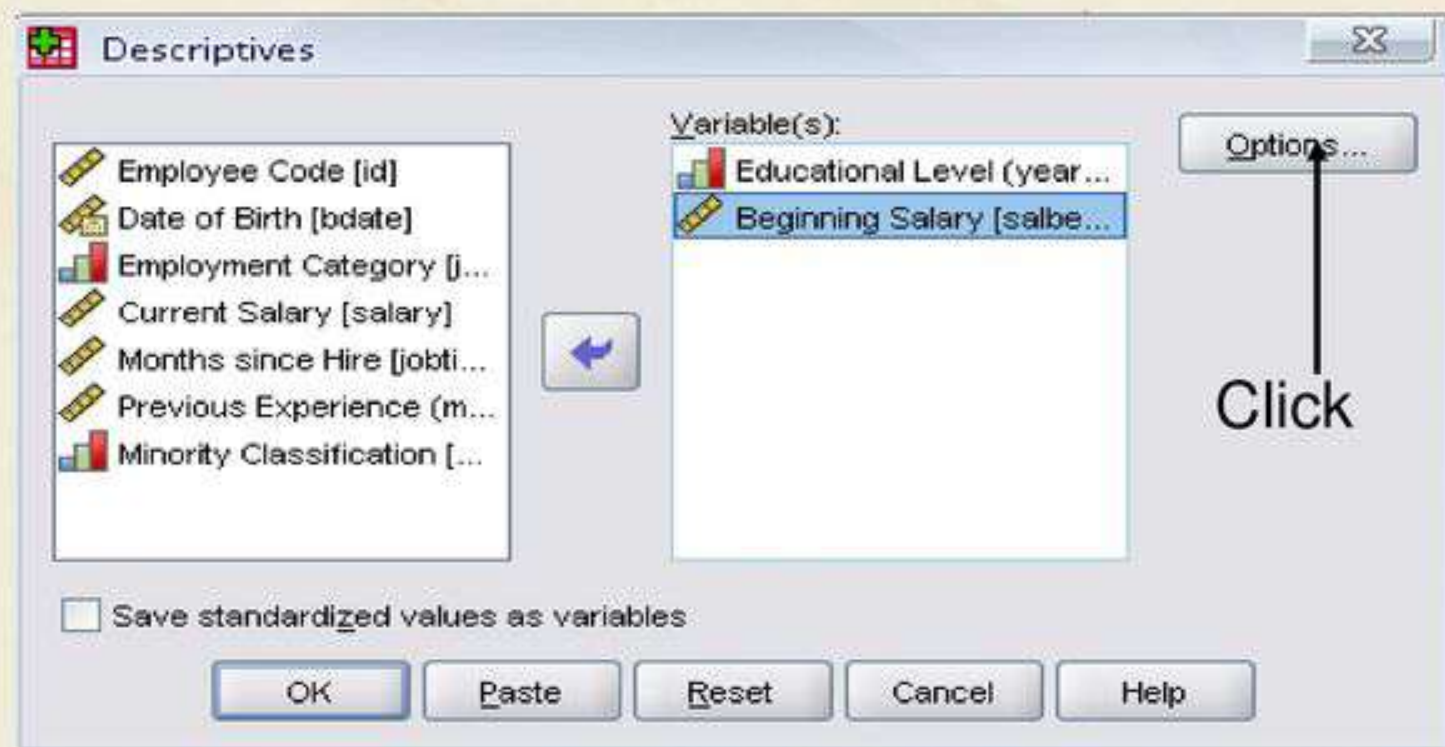
- Finally Click OK in the Frequencies box.





# Descriptives

- Click 'Analyze,' 'Descriptive statistics,' then click 'Descriptives...'
- Click 'Educational level' and 'Beginning Salary,' and put it into the variable box.
- Click Options

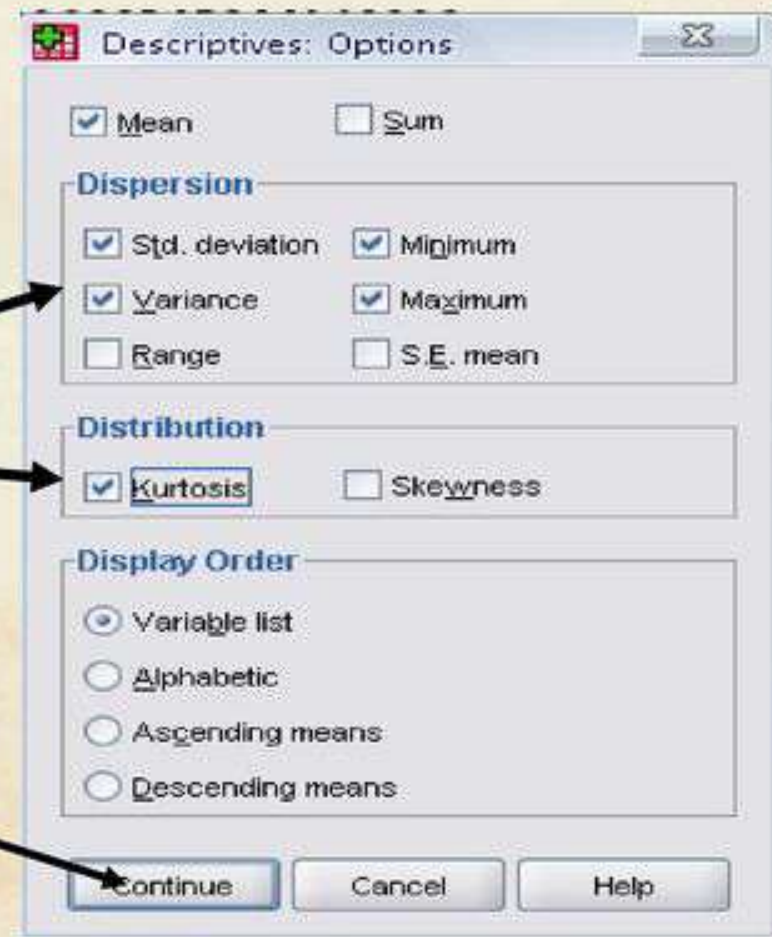


# Descriptives

- The options allows you to analyze other descriptive statistics besides the mean and Std.
- Click 'variance' and 'kurtosis'
- Finally click 'Continue'

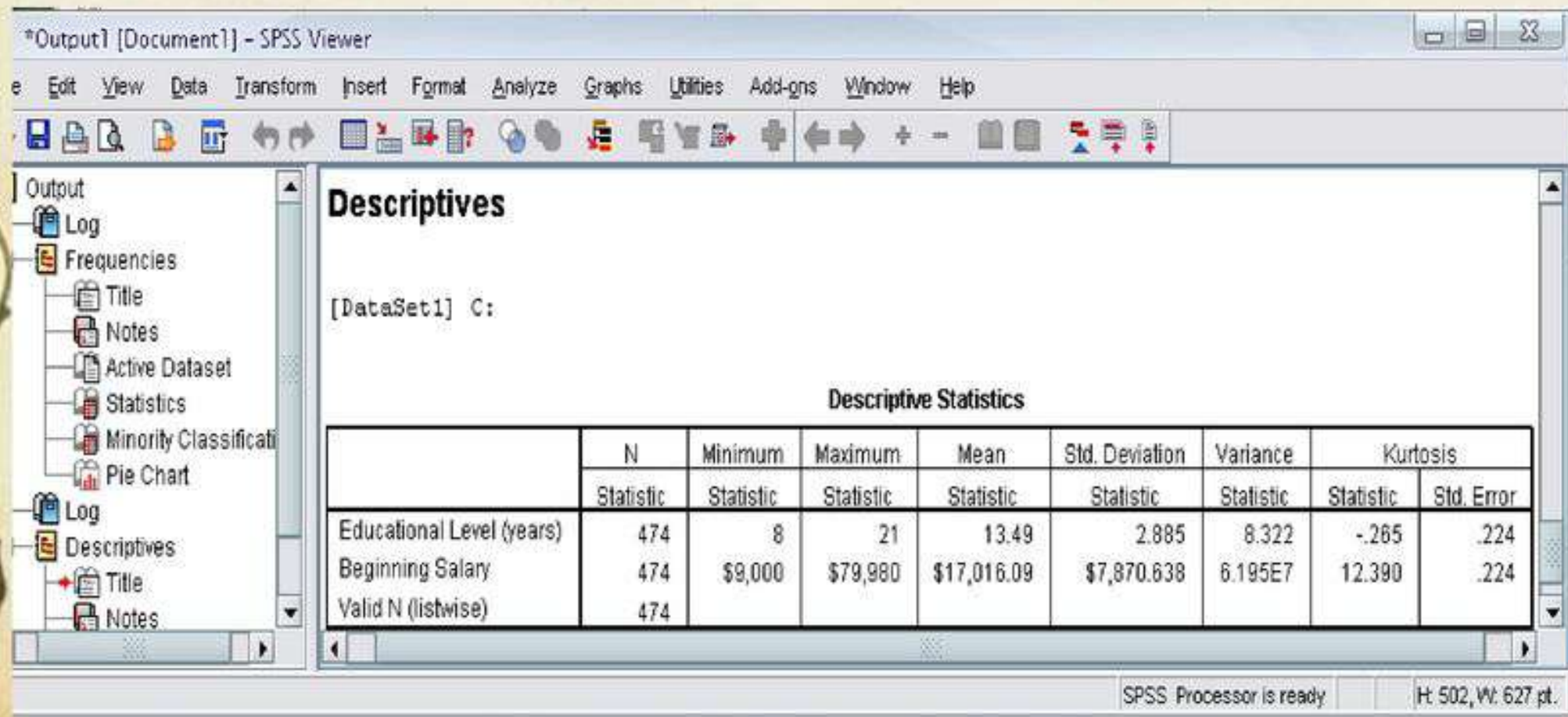
**Click**

**Click**



# Descriptives

- Finally Click OK in the Descriptives box. You will be able to see the result of the analysis.



The screenshot shows the SPSS Viewer window titled '\*Output1 [Document1] - SPSS Viewer'. The main content area displays the results of a Descriptives analysis for '[DataSet1] C:'. The results are presented in a table titled 'Descriptive Statistics'.

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Educational Level (years)	474	8	21	13.49	2.885	8.322	-.265	.224
Beginning Salary	474	\$9,000	\$79,980	\$17,016.09	\$7,870.638	6.195E7	12.390	.224
Valid N (listwise)	474							

The status bar at the bottom indicates 'SPSS Processor is ready' and 'H: 502, W: 627 pt.'.

# What we have learned!

- SPSS at a glance
- Basic Structure of SPSS
- Descriptive Statistics – frequencies, descriptive statistics



*Any Questions?*