Applying SPSS for data analysis

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Object of the seminar is to:

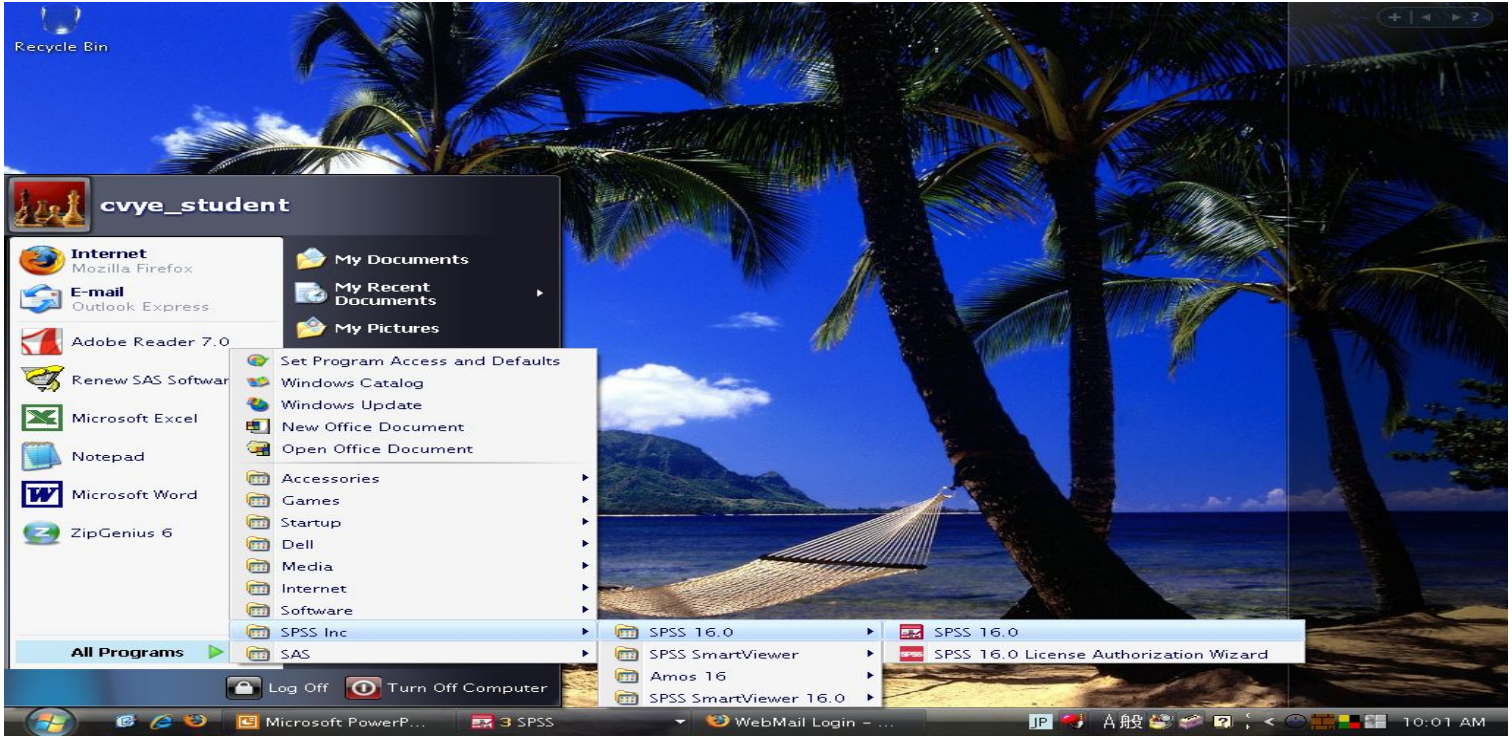
- What about the windows in SPSS
- The basics of managing data files
- The simple analysis in SPSS
- Simple practice of SPSS

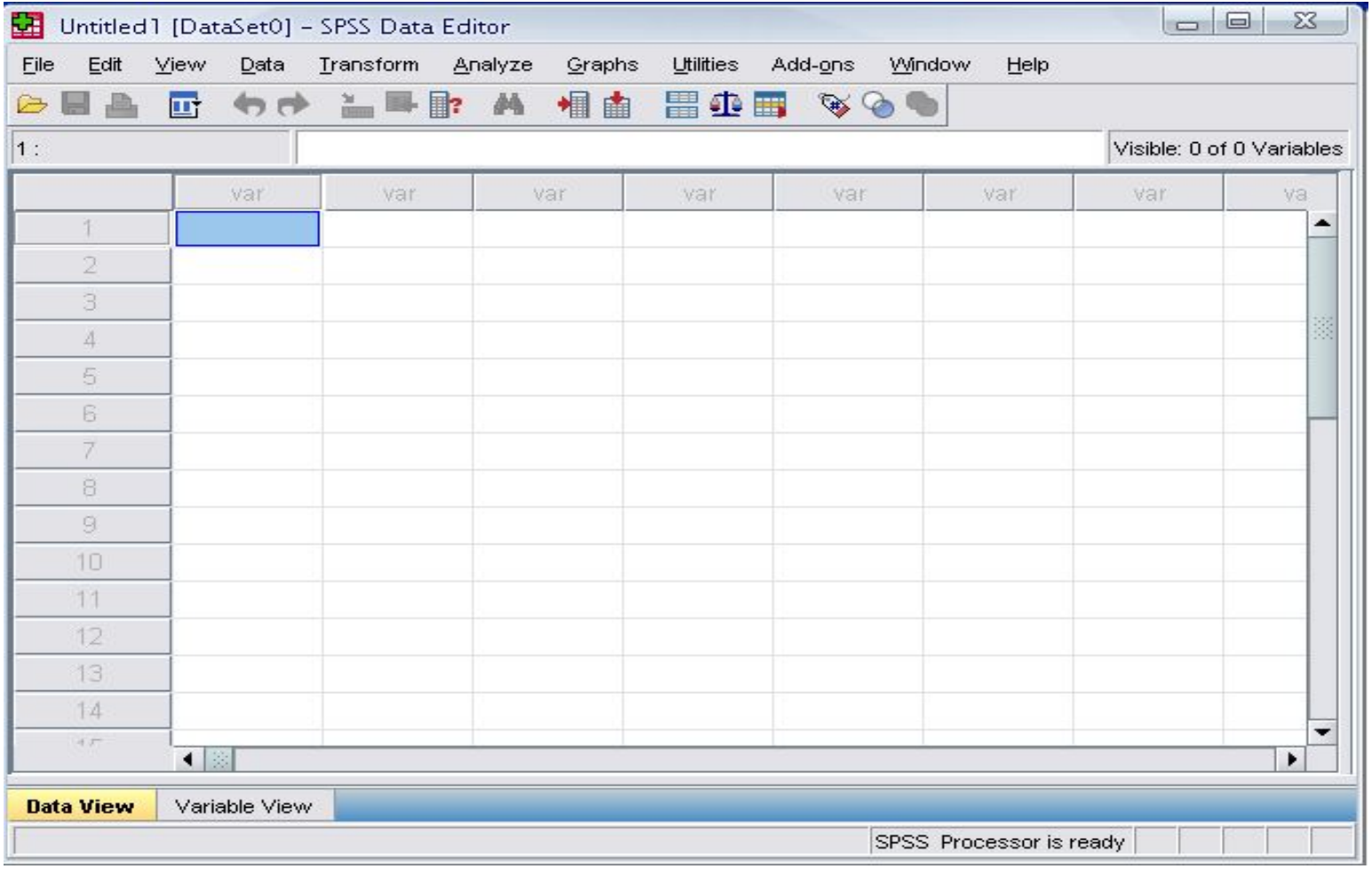
Introduction: What is SPSS?

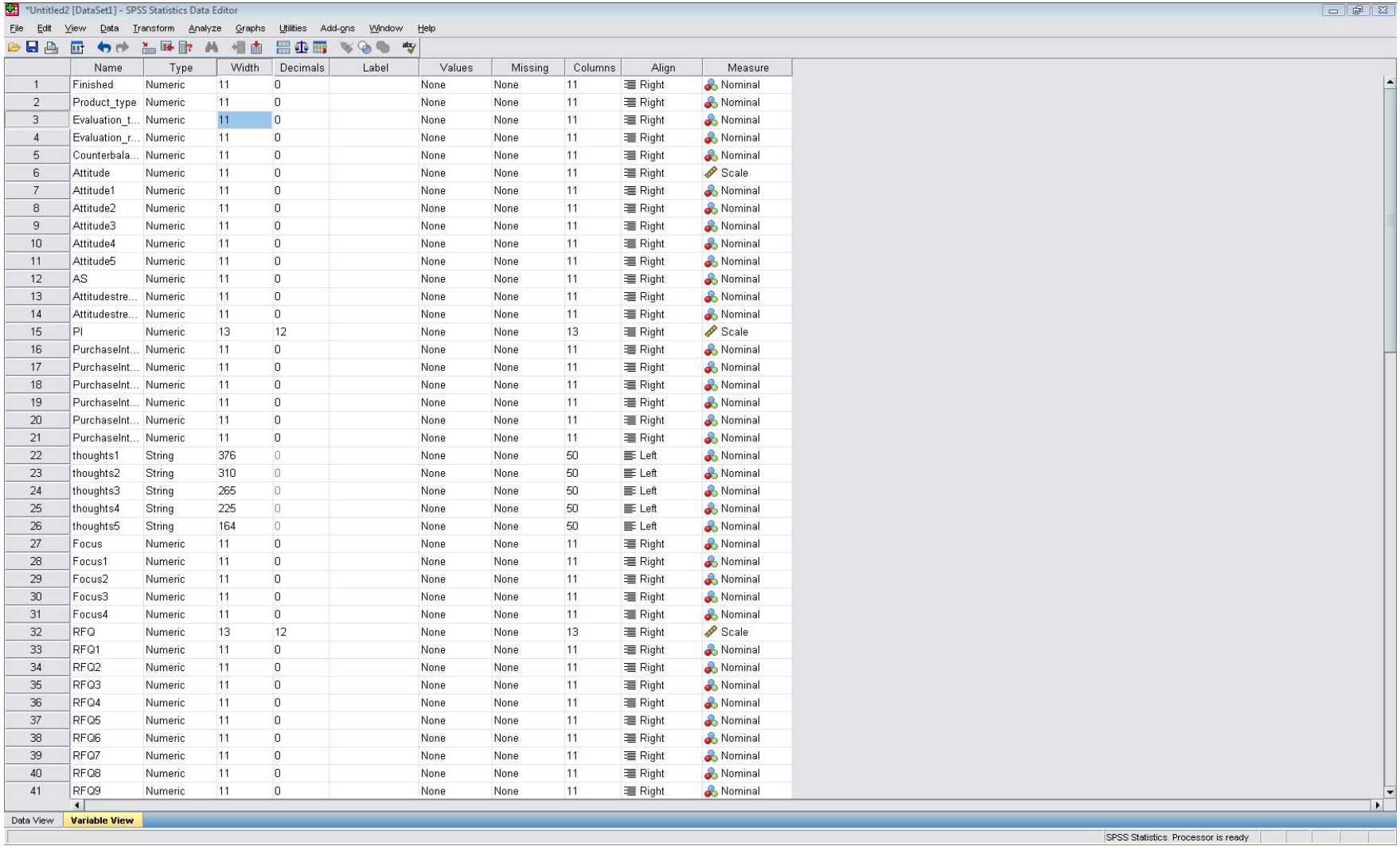
- **SPSS** is the acronym of Statistical Package for the Social Science.
- **SPSS** is one of the most popular statistical packages which can perform highly complex data manipulation and analysis with simple instructions.

Opening SPSS

- Start → All Programs → SPSS Inc→ SPSS versions → SPSS




Untitled1 [DataSet0] – SPSS Data Editor
File
Edit
View
Data
Transform
Analyze
Graphs
Utilities
Add-ons
Window
Help
1 :
Visible: 0 of 0 Variables
var
Data View
Variable View
SPSS Processor is ready



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3	Evaluation_t...	Numeric	11	0		None	None	11	Right	Nominal
4	Evaluation_r...	Numeric	11	0		None	None	11	Right	Nominal
5	Counterbala...	Numeric	11	0		None	None	11	Right	Nominal
6	Attitude	Numeric	11	0		None	None	11	Right	Scale
7	Attitude1	Numeric	11	0		None	None	11	Right	Nominal
8	Attitude2	Numeric	11	0		None	None	11	Right	Nominal
9	Attitude3	Numeric	11	0		None	None	11	Right	Nominal
10	Attitude4	Numeric	11	0		None	None	11	Right	Nominal
11	Attitude5	Numeric	11	0		None	None	11	Right	Nominal
12	AS	Numeric	11	0		None	None	11	Right	Nominal
13	Attitudestre...	Numeric	11	0		None	None	11	Right	Nominal
14	Attitudestre...	Numeric	11	0		None	None	11	Right	Nominal
15	PI	Numeric	13	12		None	None	13	Right	Scale
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22	thoughts1	String	376	0		None	None	50	Left	Nominal
23	thoughts2	String	310	0		None	None	50	Left	Nominal
24	thoughts3	String	265	0		None	None	50	Left	Nominal
25	thoughts4	String	225	0		None	None	50	Left	Nominal
26	thoughts5	String	164	0		None	None	50	Left	Nominal
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28	Focus1	Numeric	11	0		None	None	11	Right	Nominal
29	Focus2	Numeric	11	0		None	None	11	Right	Nominal
30	Focus3	Numeric	11	0		None	None	11	Right	Nominal
31	Focus4	Numeric	11	0		None	None	11	Right	Nominal
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34	RFQ2	Numeric	11	0		None	None	11	Right	Nominal
35	RFQ3	Numeric	11	0		None	None	11	Right	Nominal
36	RFQ4	Numeric	11	0		None	None	11	Right	Nominal
37	RFQ5	Numeric	11	0		None	None	11	Right	Nominal
38	RFQ6	Numeric	11	0		None	None	11	Right	Nominal
39	RFQ7	Numeric	11	0		None	None	11	Right	Nominal
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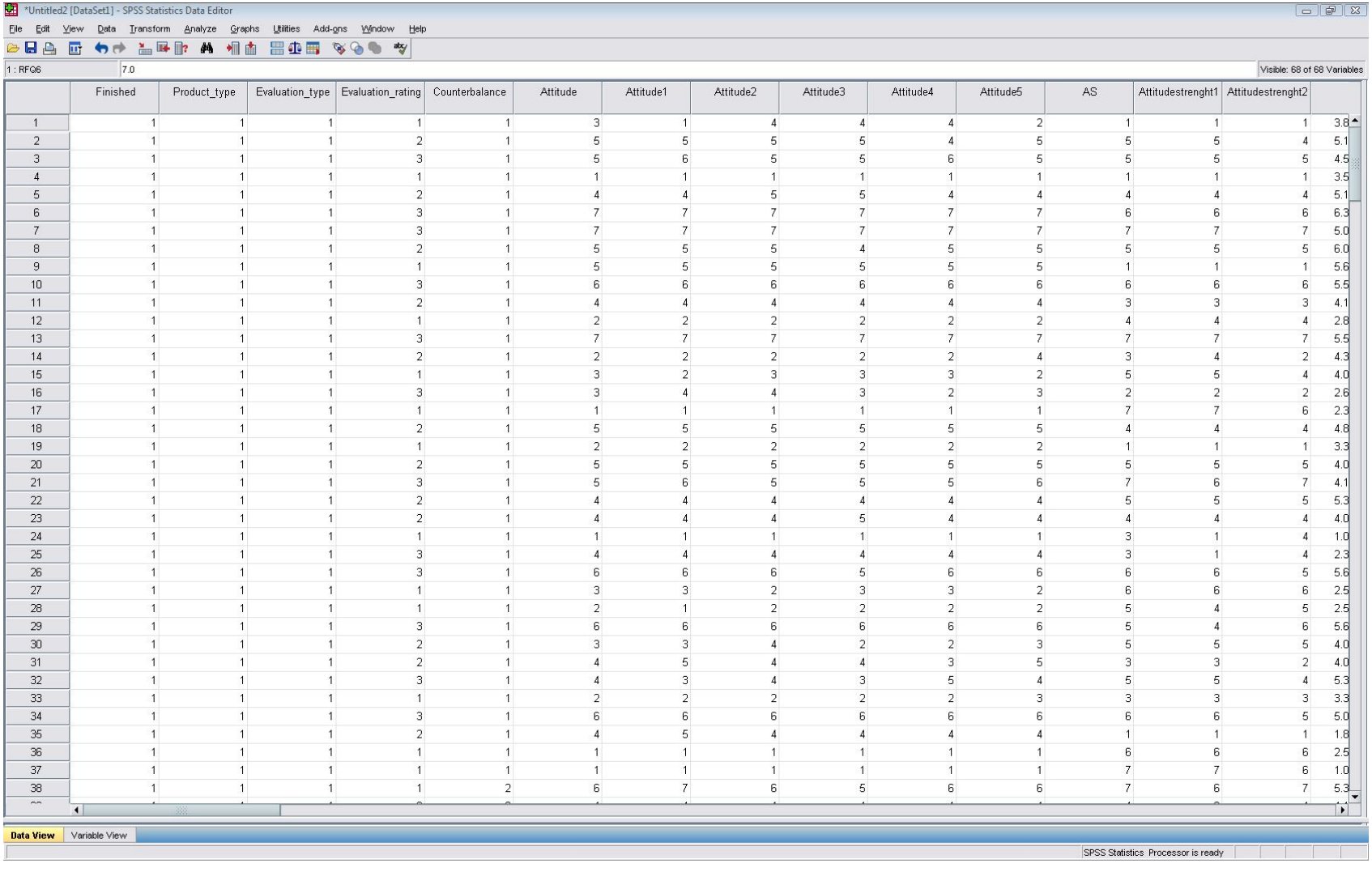
41	RFQ9	Numeric	11	0		None	None	11	Right	Nominal



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1	1	1	1	1	1	3	1	4	4	4	2	1	1	1	3.8
2	1	1	1	2	1	5	5	5	5	4	5	5	5	4	5.1
3	1	1	1	3	1	5	6	5	5	6	5	5	5	5	4.5
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3.5
5	1	1	1	2	1	4	4	5	5	4	4	4	4	4	5.1
6	1	1	1	3	1	7	7	7	7	7	7	6	6	6	6.3
7	1	1	1	3	1	7	7	7	7	7	7	7	7	7	5.0
8	1	1	1	2	1	5	5	5	4	5	5	5	5	5	6.0
9	1	1	1	1	1	5	5	5	5	5	5	1	1	1	5.6
10	1	1	1	3	1	6	6	6	6	6	6	6	6	6	5.5
11	1	1	1	2	1	4	4	4	4	4	4	3	3	3	4.1
12	1	1	1	1	1	2	2	2	2	2	2	4	4	4	2.8
13	1	1	1	3	1	7	7	7	7	7	7	7	7	7	5.5
14	1	1	1	2	1	2	2	2	2	2	4	3	4	2	4.3
15	1	1	1	1	1	3	2	3	3	3	2	5	5	4	4.0
16	1	1	1	3	1	3	4	4	3	2	3	2	2	2	2.6
17	1	1	1	1	1	1	1	1	1	1	1	7	7	6	2.3
18	1	1	1	2	1	5	5	5	5	5	5	4	4	4	4.8
19	1	1	1	1	1	2	2	2	2	2	2	1	1	1	3.3
20	1	1	1	2	1	5	5	5	5	5	5	5	5	5	4.0
21	1	1	1	3	1	5	6	5	5	5	6	7	6	7	4.1
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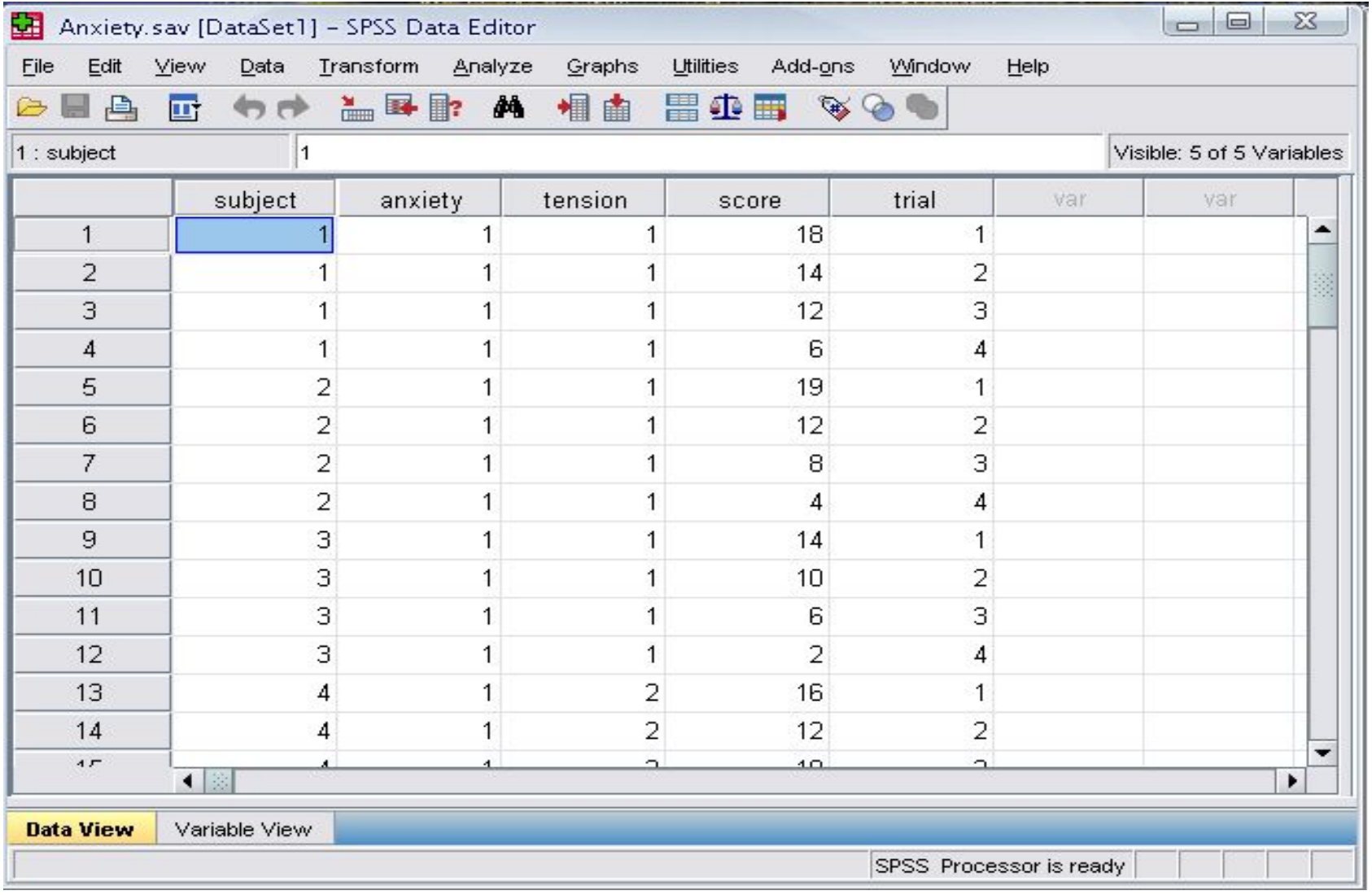
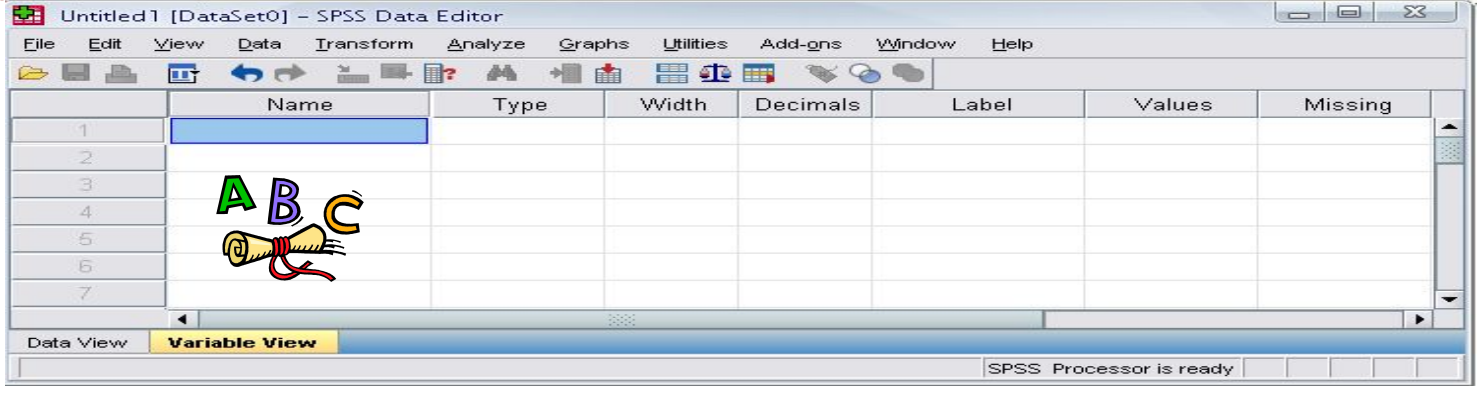
24	1	1	1	1	1	1	1	1	1	1	1	3	1	4	1.0
25	1	1	1	3	1	4	4	4	4	4	4	3	1	4	2.3
26	1	1	1	3	1	6	6	6	5	6	6	6	6	5	5.6
27	1	1	1	1	1	3	3	2	3	3	2	6	6	6	2.5
28	1	1	1	1	1	2	1	2	2	2	2	5	4	5	2.5
29	1	1	1	3	1	6	6	6	6	6	6	5	4	6	5.6
30	1	1	1	2	1	3	3	4	2	2	3	5	5	5	4.0
31	1	1	1	2	1	4	5	4	4	3	5	3	3	2	4.0
32	1	1	1	3	1	4	3	4	3	5	4	5	5	4	5.3
33	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3.3
34	1	1	1	3	1	6	6	6	6	6	6	6	6	5	5.0
35	1	1	1	2	1	4	5	4	4	4	4	1	1	1	1.8
36	1	1	1	1	1	1	1	1	1	1	1	6	6	6	2.5
37	1	1	1	1	1	1	1	1	1	1	1	7	7	6	1.0
38	1	1	1	1	2	6	7	6	5	6	6	7	6	7	5.3


Anxiety.sav [DataSet1] – SPSS Data Editor
File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help
1 : subject
1
Visible: 5 of 5 Variables
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
Data View
Variable View
SPSS Processor is ready

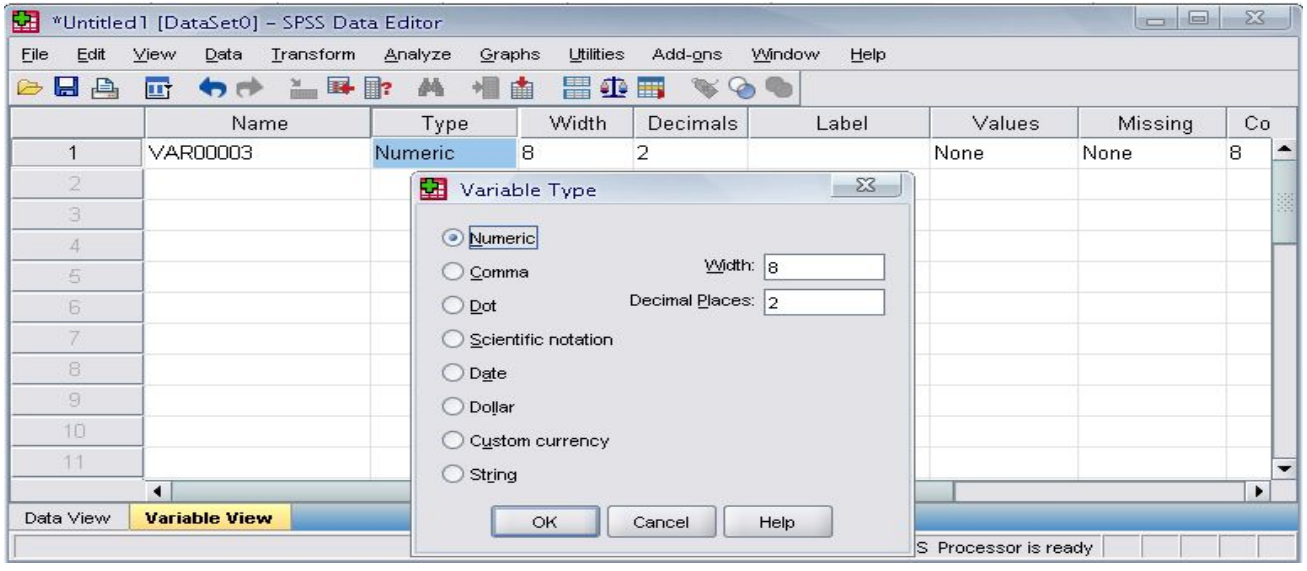
Variable View window

- 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



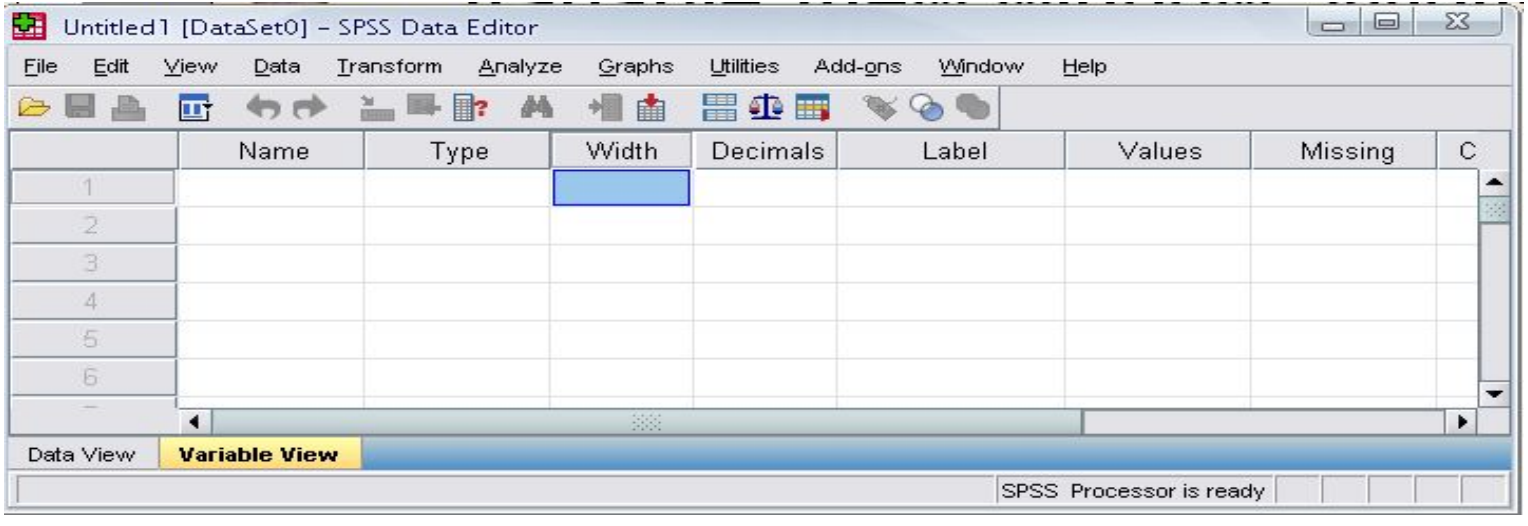
Variable View window: Type

- Type
  - Click on the ‘type’ box. The two basic types of variables that you will use are numeric and string. This column enables you to specify the type of variable.



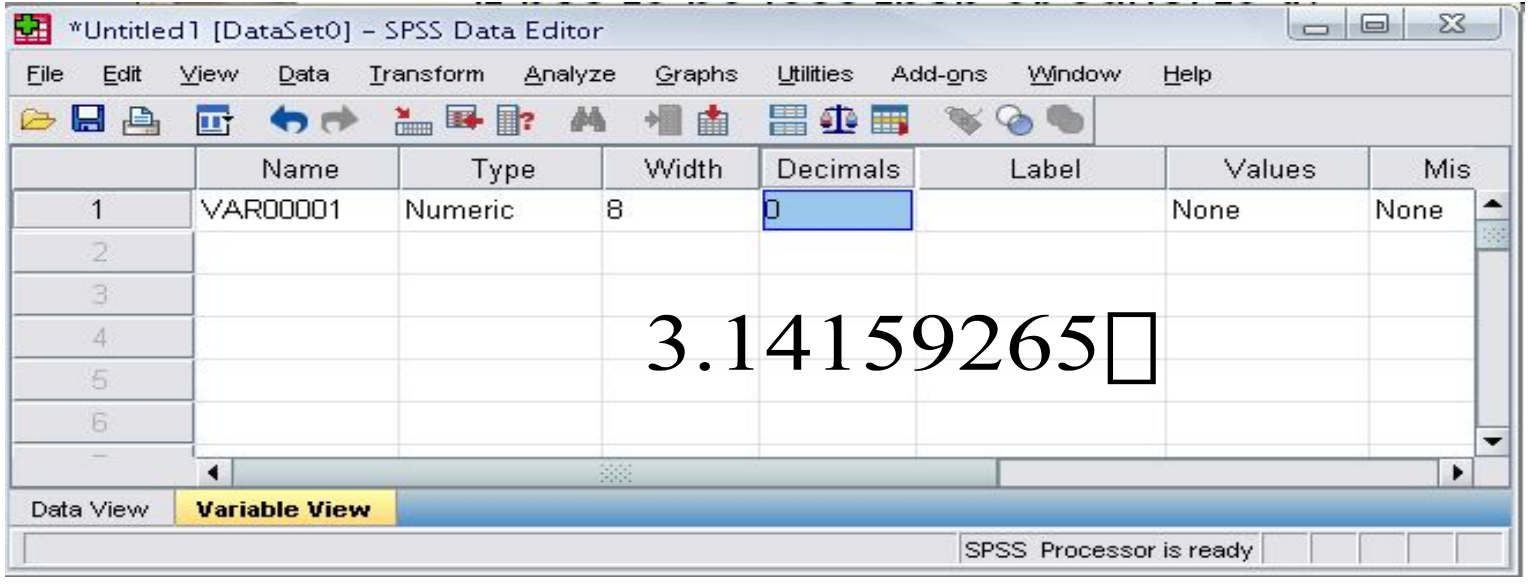
Variable View window: Width

- Width
  - Width allows you to determine the number of characters SPSS will allow to be entered for the variable



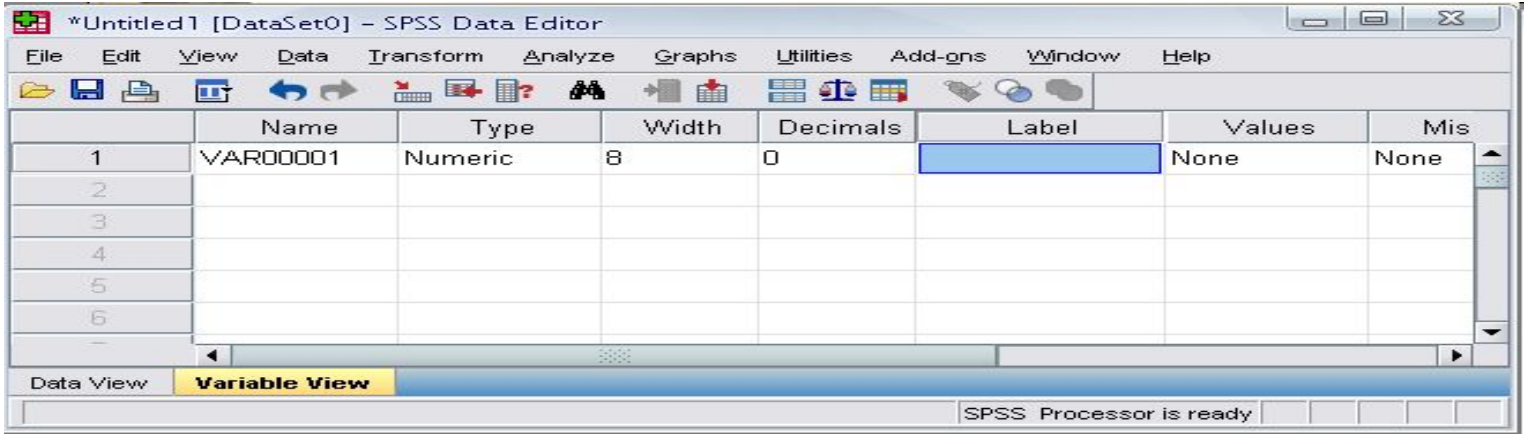
Variable View window: Decimals

- Decimals
  - Number of decimals
  - It has to be less than or equal to 16



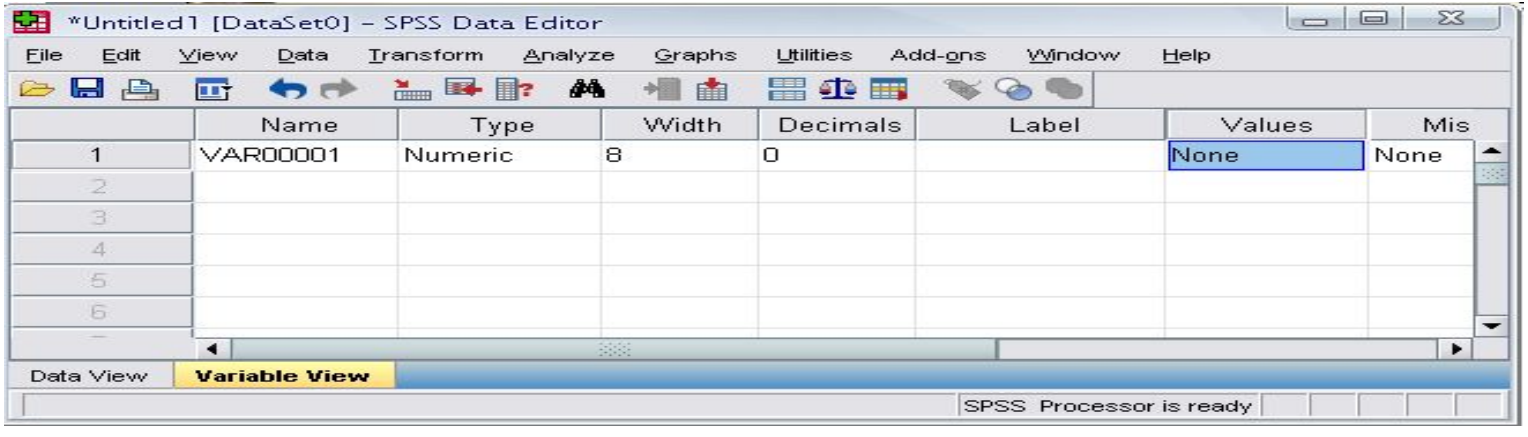
Variable View window: Label

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



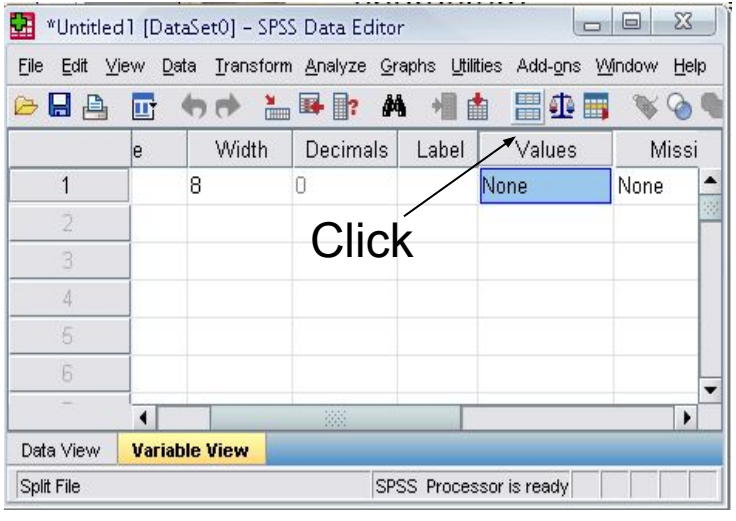
Variable View window: Values

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

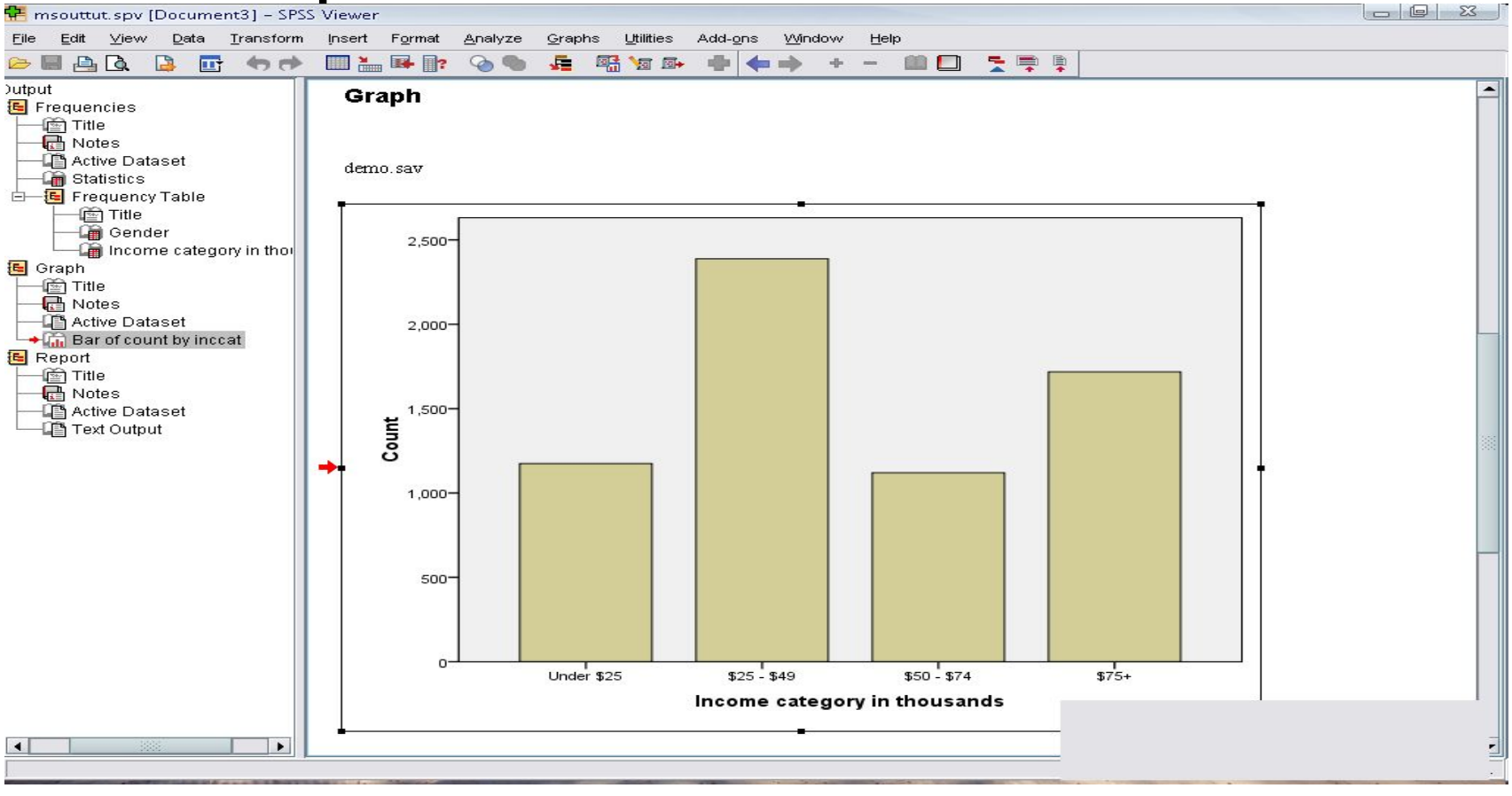


Defining the value labels

- 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.



Output Viewer

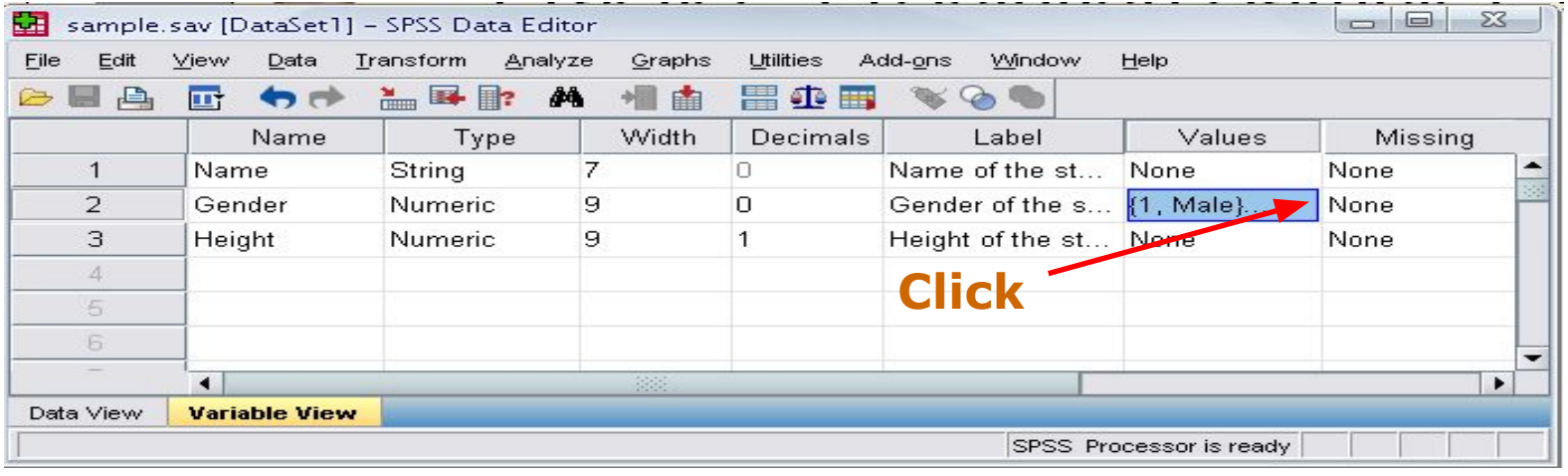


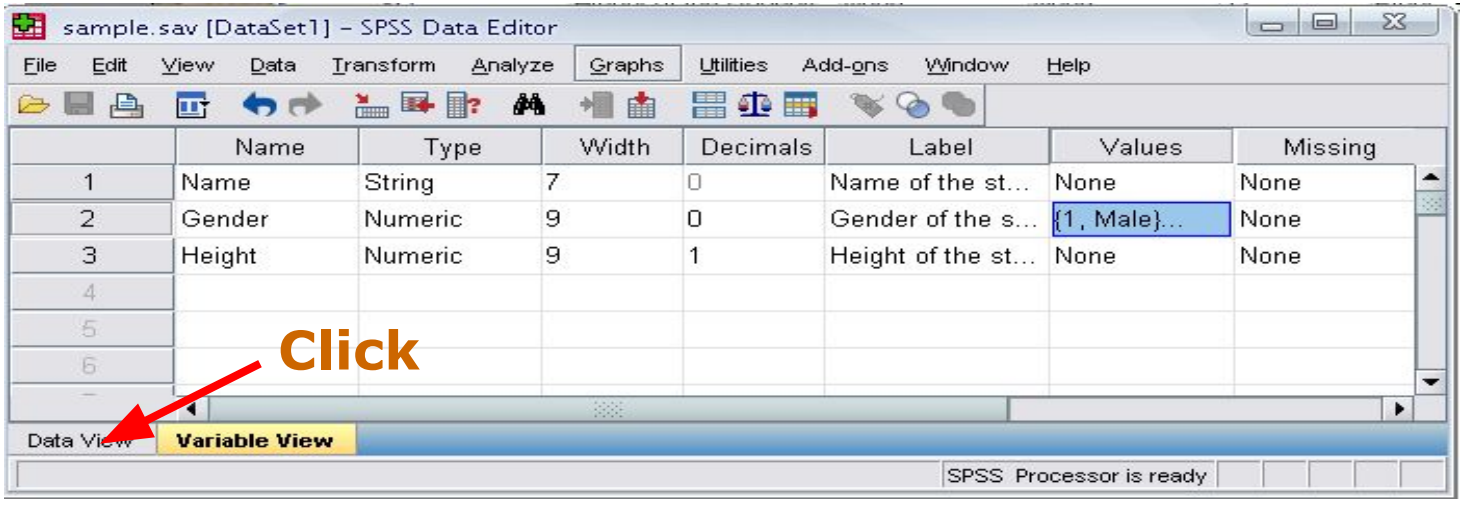
Practice 1

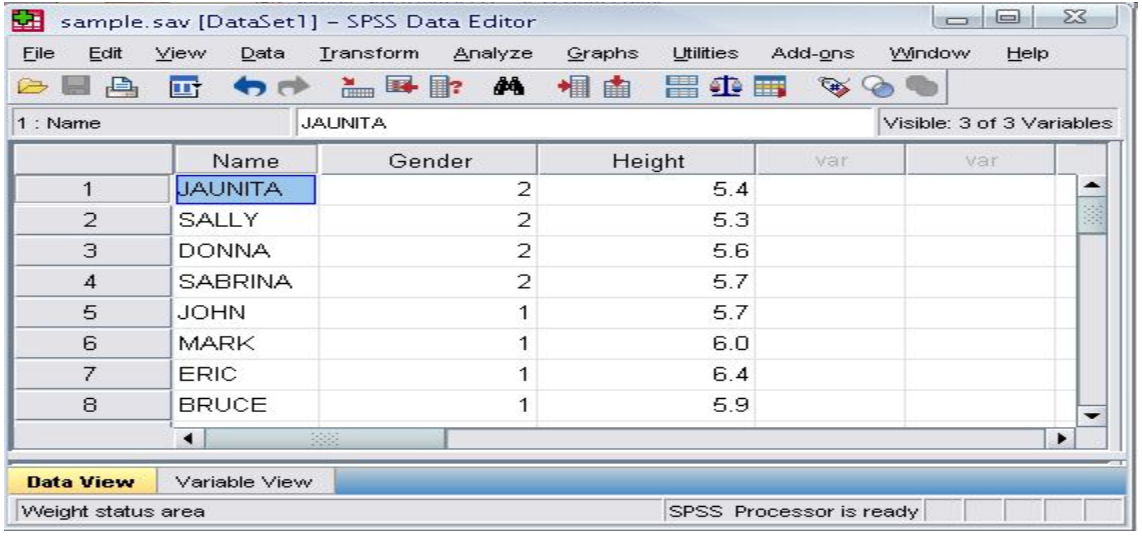
- How would you put the following information into SPSS?

name	gender	height
sheryl	female	5.7
jennifer	female	5.4
tara	female	5.3
christian	male	5.6
jose	male	5.8
roberto	male	5.7
kasie	female	5.5
cady	female	5.5
sandy	female	5.6
daniel	male	6
kurra	female	5.4
ashley	female	5.4
alain	male	6.1

Practice 1 (Solution Sample)

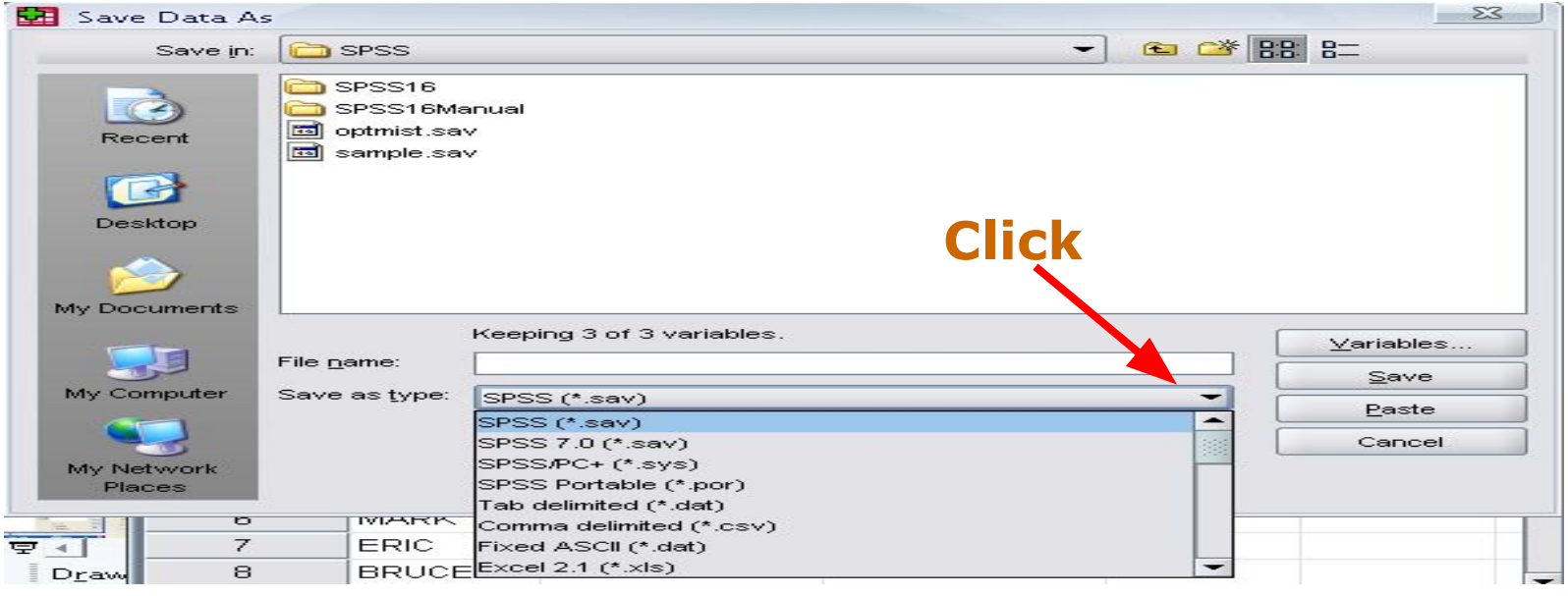



sample.sav [DataSet1] – SPSS Data Editor
File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help
Name Type Width Decimals Label Values Missing
1 Name String 7 0 Name of the st... None None
2 Gender Numeric 9 0 Gender of the s... {1, Male}... None
3 Height Numeric 9 1 Height of the st... None None
4
5
6
Click
Data View
Variable View
SPSS Processor is ready


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

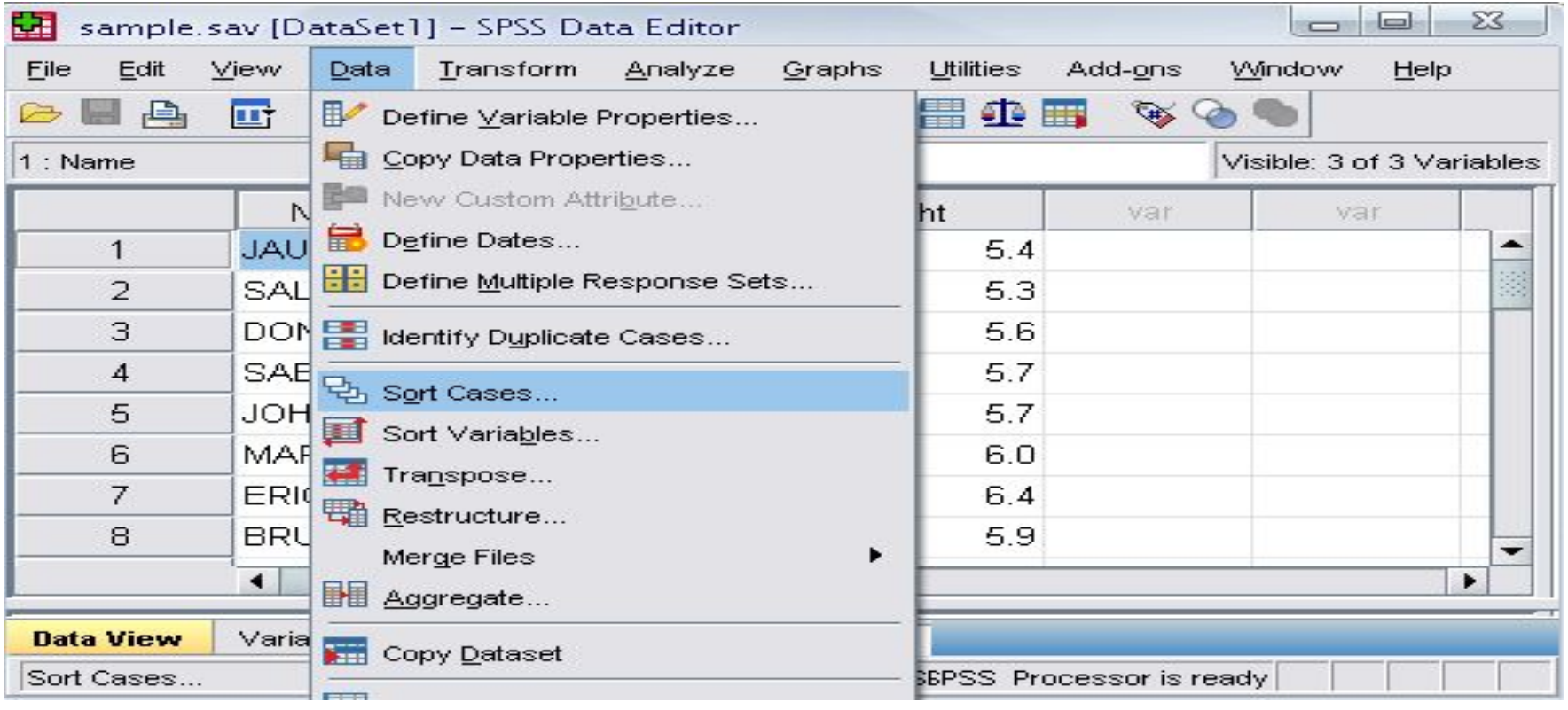
Saving the data

- 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.”

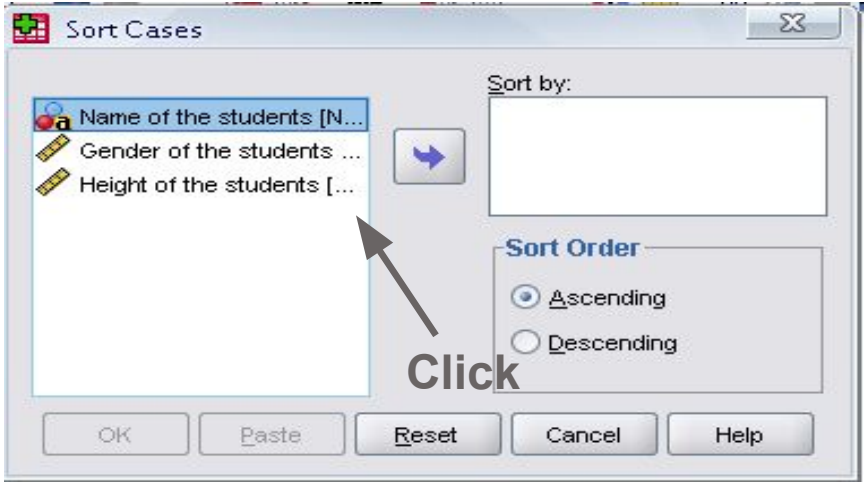


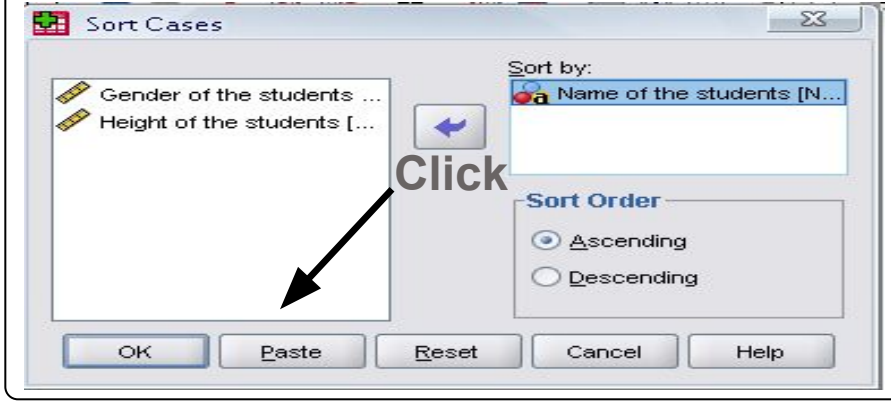
Sorting the data

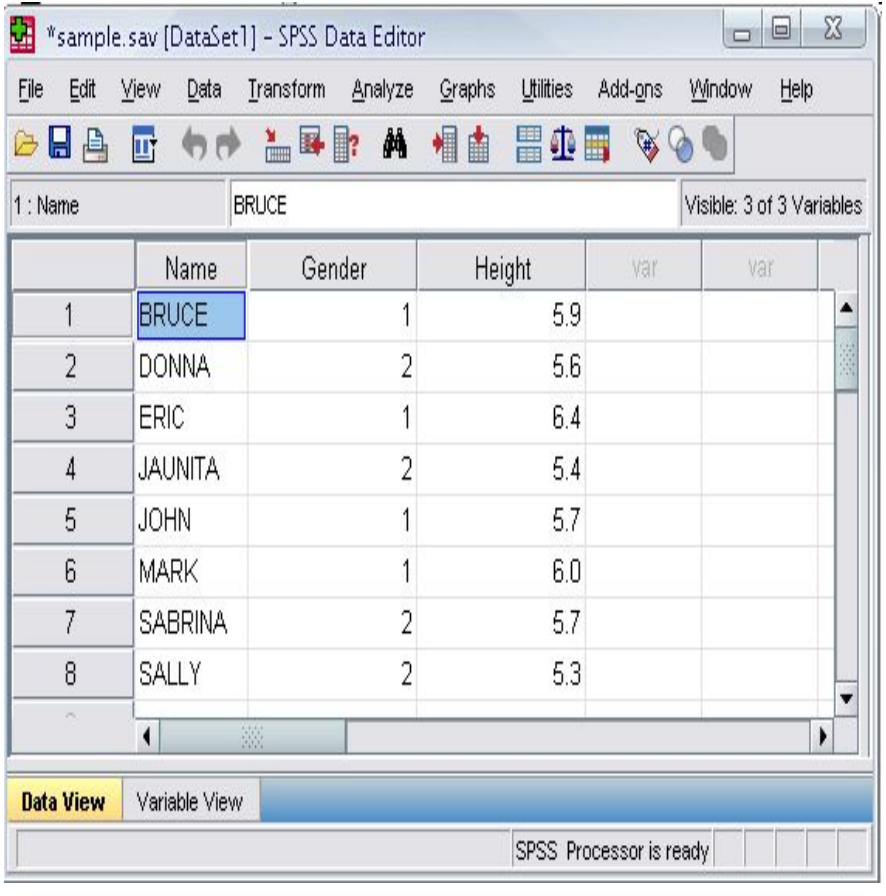
- Click ‘Data’ and then click Sort Cases



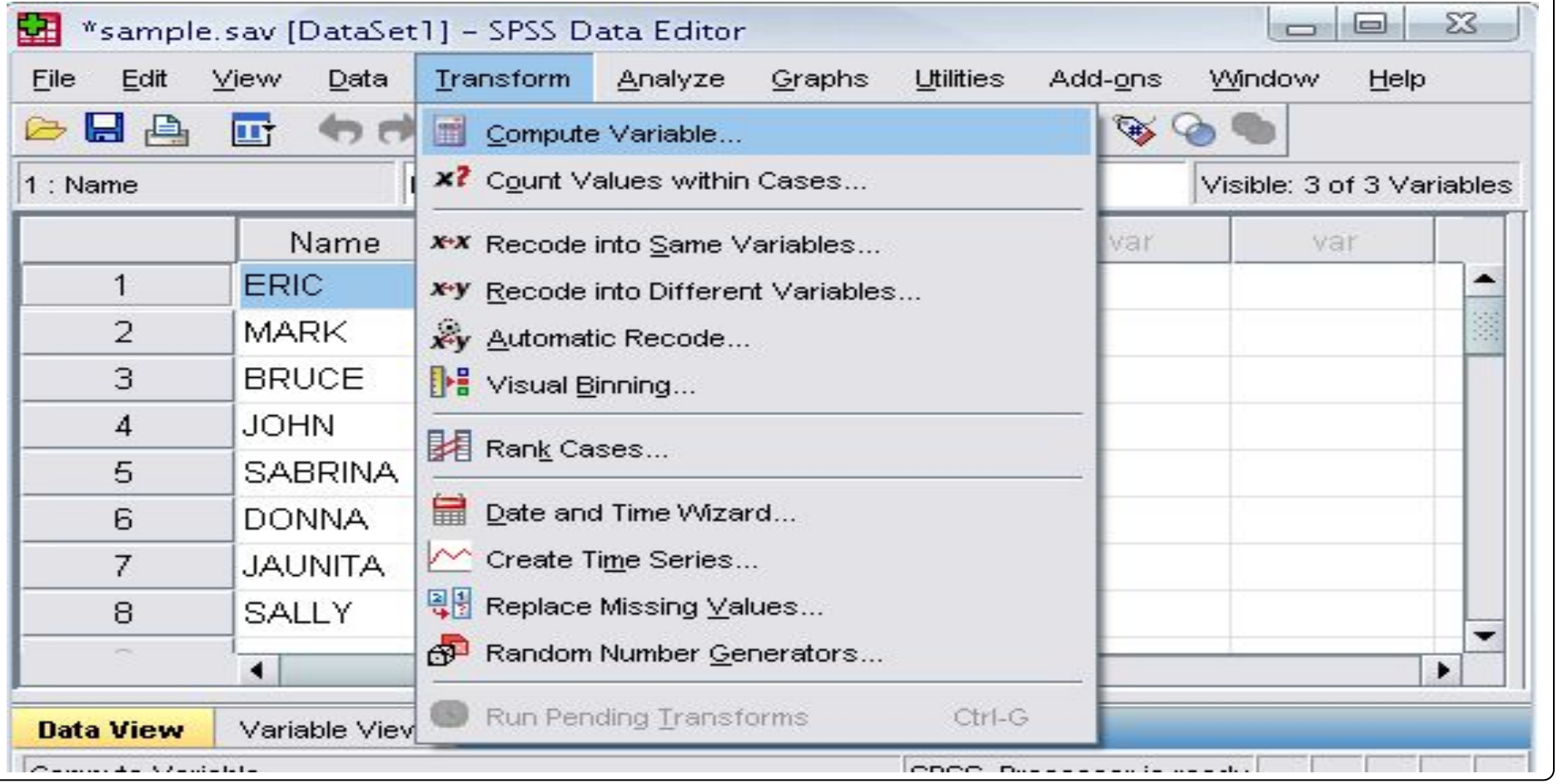
Sorting the data (cont'd)





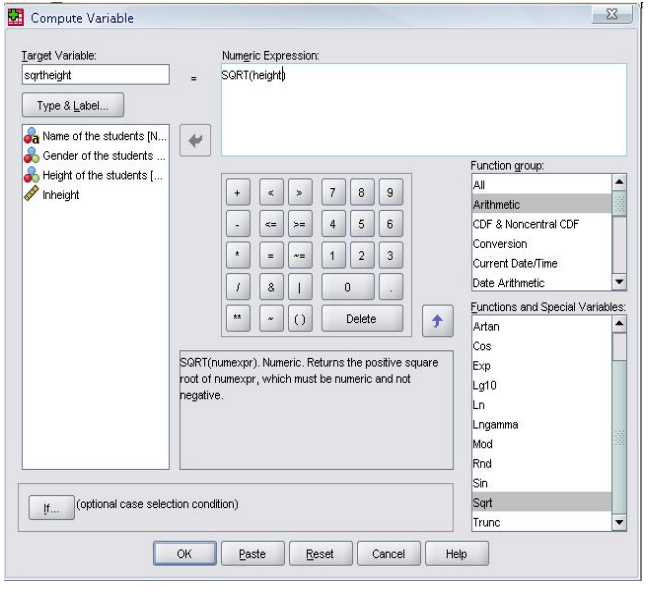


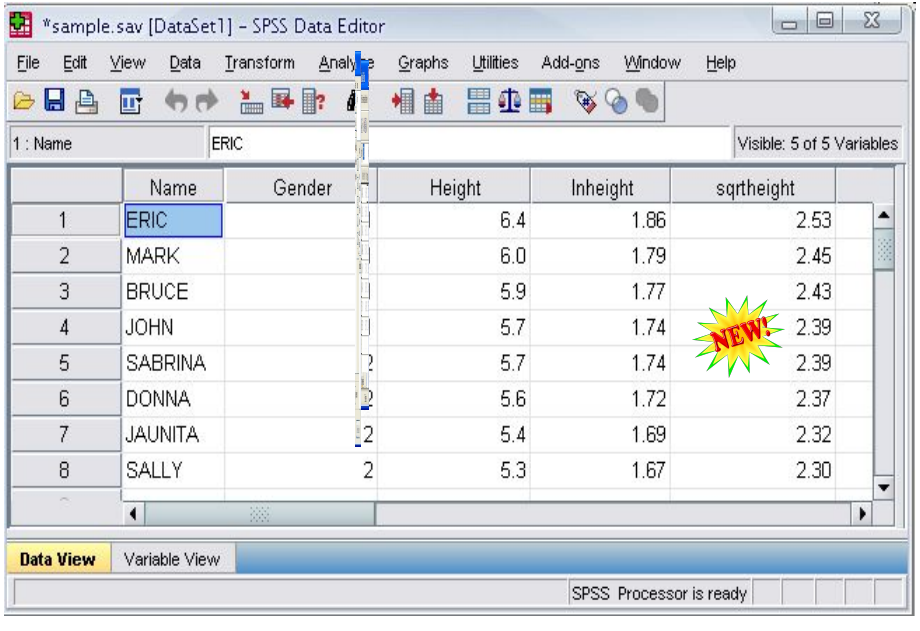
Transforming data



Practice 3

- Create a new variable named “sqrtheight” which is the square root of height.
- Answer





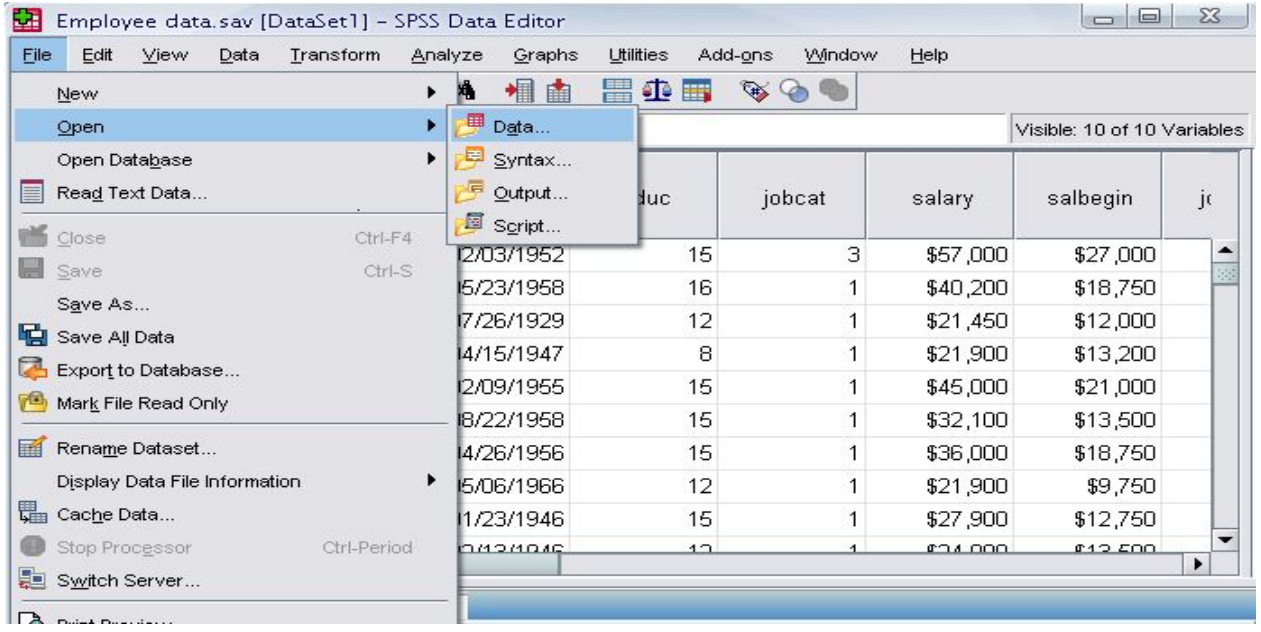
The basic analysis

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

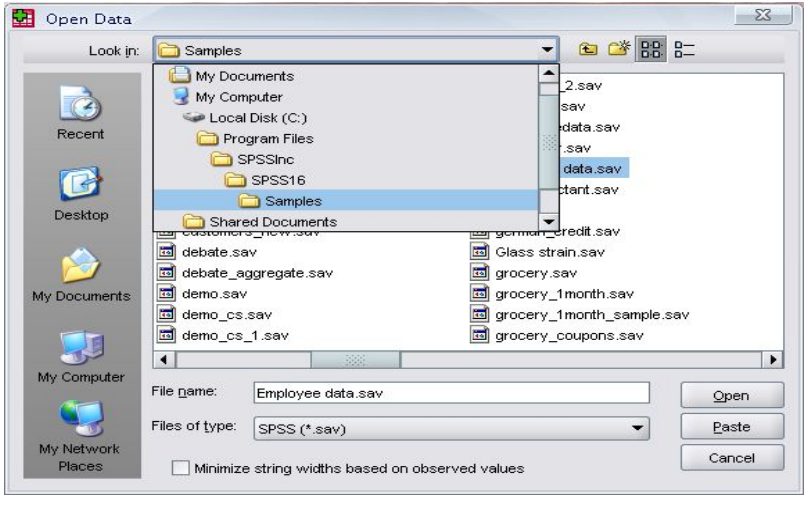
Opening the sample data

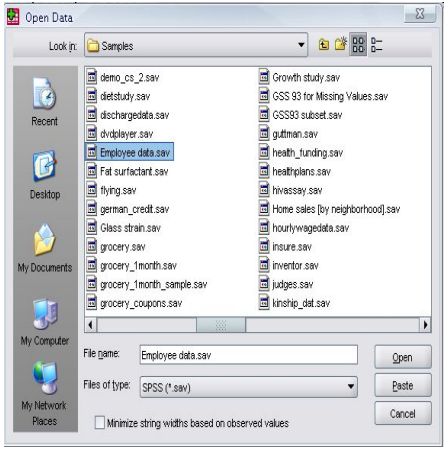
- Open ‘Employee data.sav’ from the SPSS
  - Go to “File,” “Open,” and Click Data



Opening the sample data

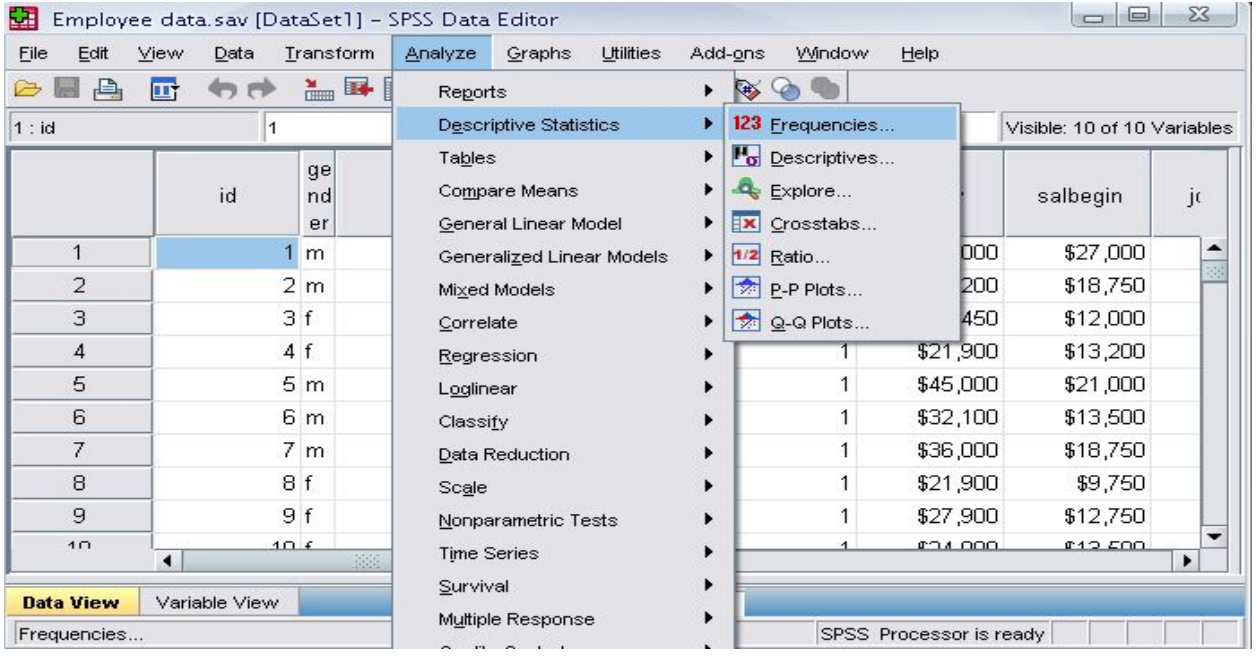
- Go to Program Files," "SPSSInc," "SPSS16," and "Samples" folder.
- Open "Employee Data.sav" file





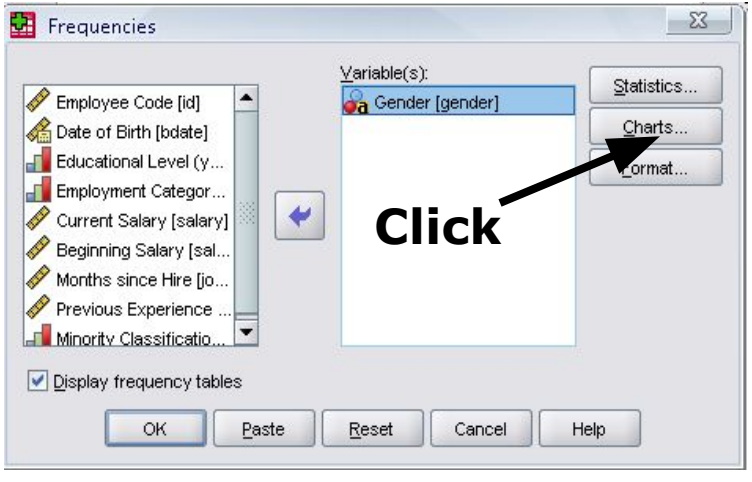
Frequencies

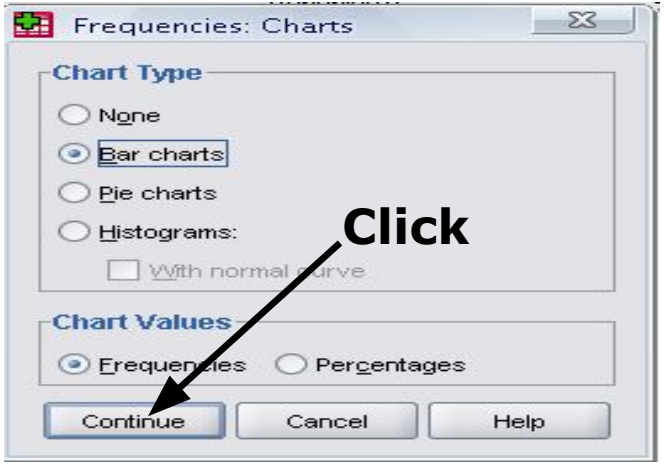
- Click ‘Analyze,’ ‘Descriptive statistics,’ then click ‘Frequencies’



Frequencies

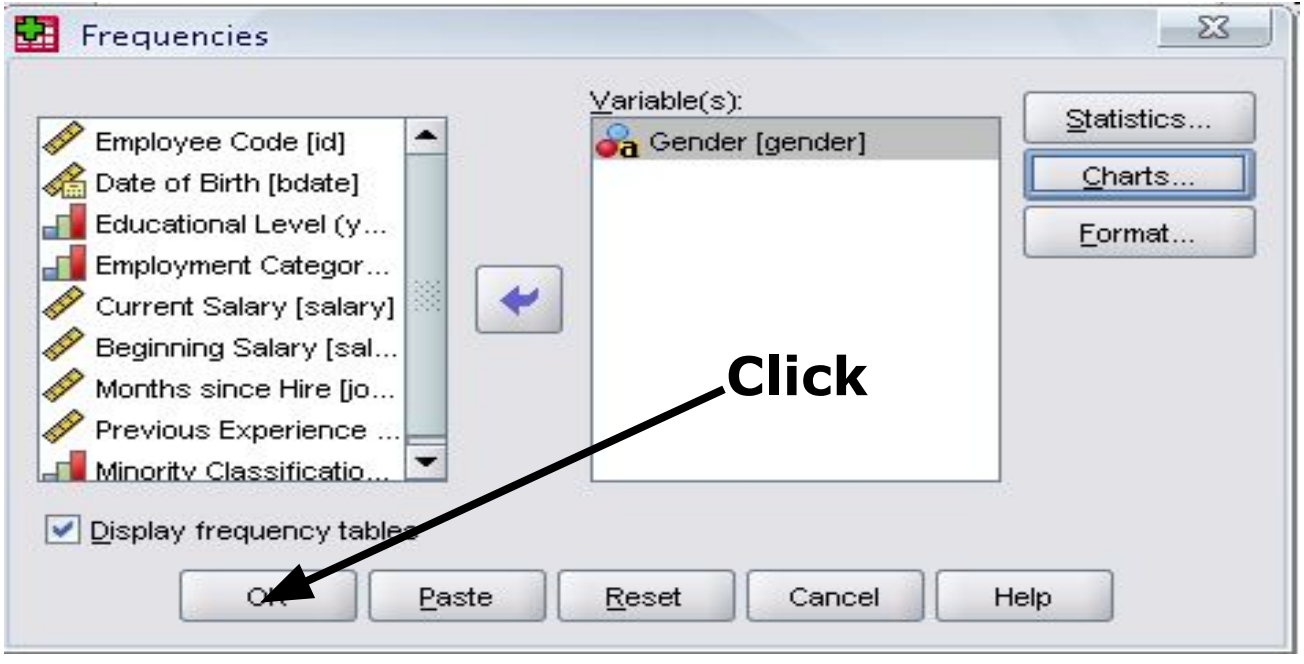
- Click gender and put it into the variable box.
- Click ‘Charts.’
- Then click ‘Bar charts’ and click ‘Continue.’

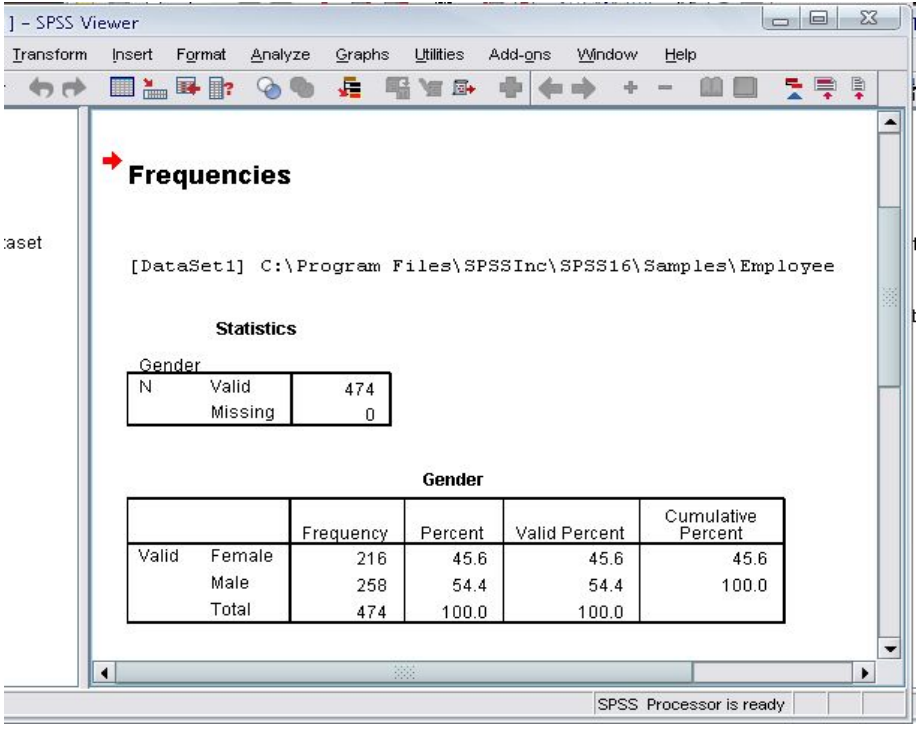


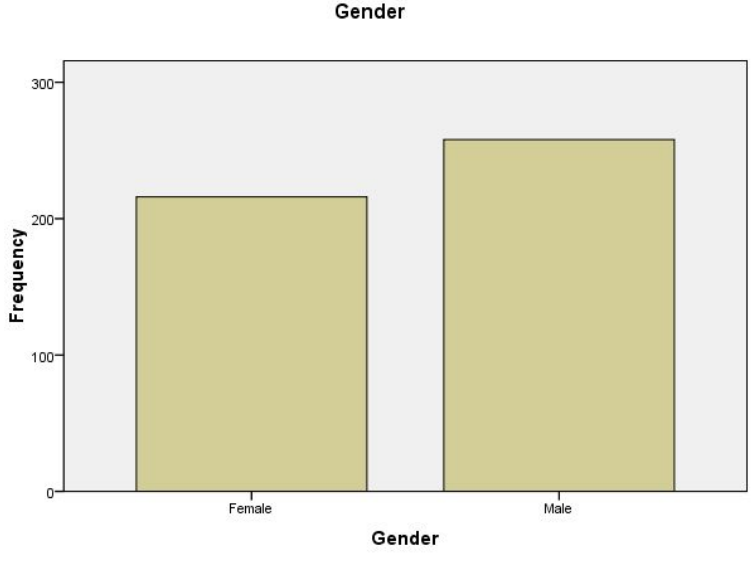


Frequencies

- Finally Click OK in the Frequencies box.

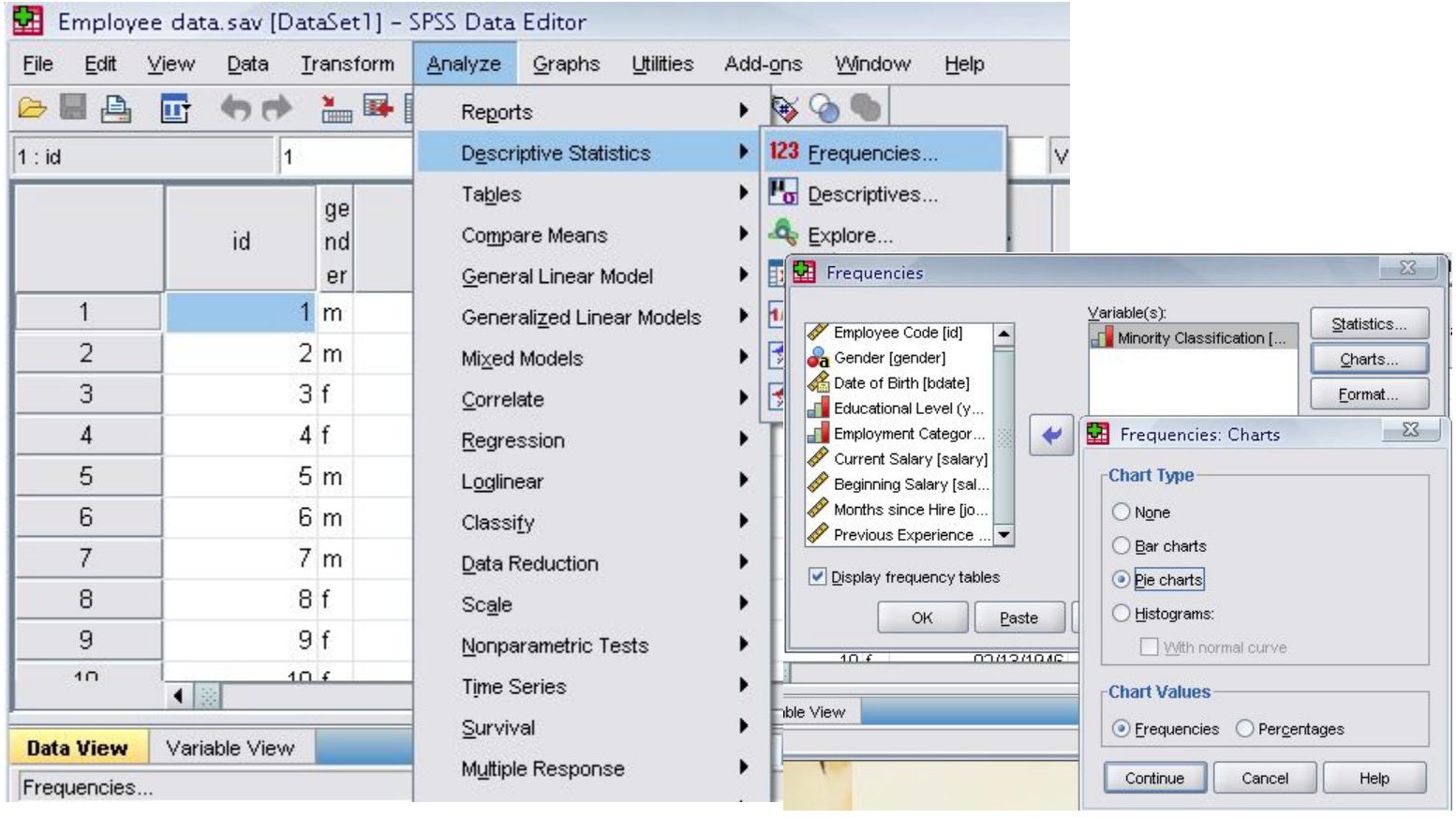



] – SPSS Viewer
Transform Insert Format Analyze Graphs Utilities Add-ons Window Help
Frequencies
[DataSet1] C:\Program Files\SPSSInc\SPSS16\Samples\Employee
Statistics
Gender
N Valid 474
Missing 0
Gender
Frequency Percent Valid Percent Cumulative Percent
Valid Female 216 45.6 45.6 45.6
Male 258 54.4 54.4 100.0
Total 474 100.0 100.0
SPSS Processor is ready


Gender
300
200
100
0
Frequency
Female
Male
Gender

Practice 4

- Do a frequency analysis on the variable “minority”
- Create pie charts for it


Employee data.sav [DataSet1] – SPSS Data Editor
File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help
Reports
Descriptive Statistics
Tables
Compare Means
General Linear Model
Generalized Linear Models
Mixed Models
Correlate
Regression
Loglinear
Classify
Data Reduction
Scale
Nonparametric Tests
Time Series
Survival
Multiple Response
Frequencies...
Descriptives...
Explore...
1 : id
id
gender
Data View
Variable View
Frequencies
Employee Code [id]
Gender [gender]
Date of Birth [bdate]
Educational Level (y...
Employment Categor...
Current Salary [salary]
Beginning Salary [sal...
Months since Hire [jo...
Previous Experience ...
Variable(s):
Minority Classification [...
Statistics...
Charts...
Format...
Display frequency tables
OK
Paste
Frequencies: Charts
Chart Type
None
Bar charts
Pie charts
Histograms:
With normal curve
Chart Values
Frequencies
Percentages
Continue
Cancel
Help

Questionnaire

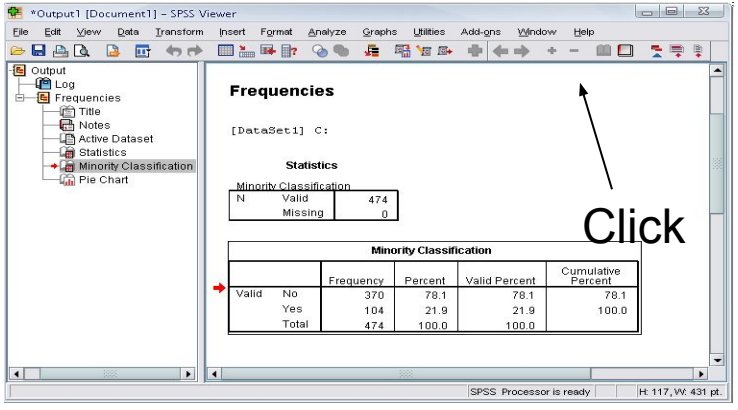
Part one: socio-demographic characteristics of participants:

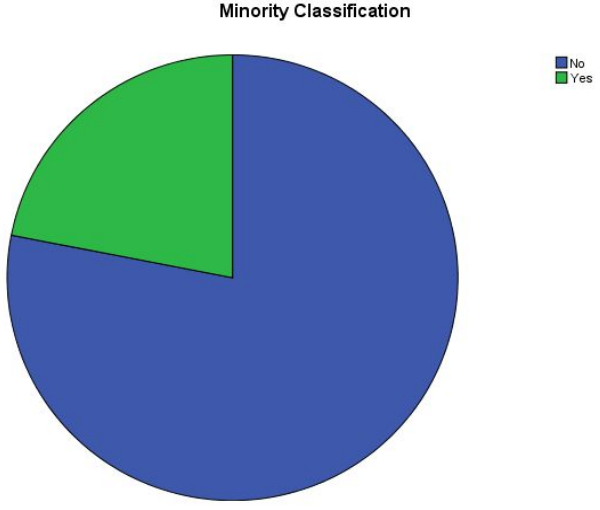
- **Age:** ----------
- **Gender:** Male 1 Female 2
- **Level of education:** Physician 1 Nurses 2 other health care providers 3
- **Socio-economic status** Satisfied 1 somehow sufficed 2 bad 3
- **Marital status**: Single 1 Married 2

Part two: Quality of patient records; participant view.

	Patient records	Agree 1		Disagree 2	
	Consist of detailed information				
2.	Missed spelling				
3.	All have right for write their notes				
4.	Nurses has right for writing her notes				
5.	Laboratories have right recording their nots on patient record				
6.	It is in high quality				
7.	Provide the patient's privacy				
8.	The notes written in good approach				
9.	The patient record represent the standard.				
10.	The patient records are stored correctly				

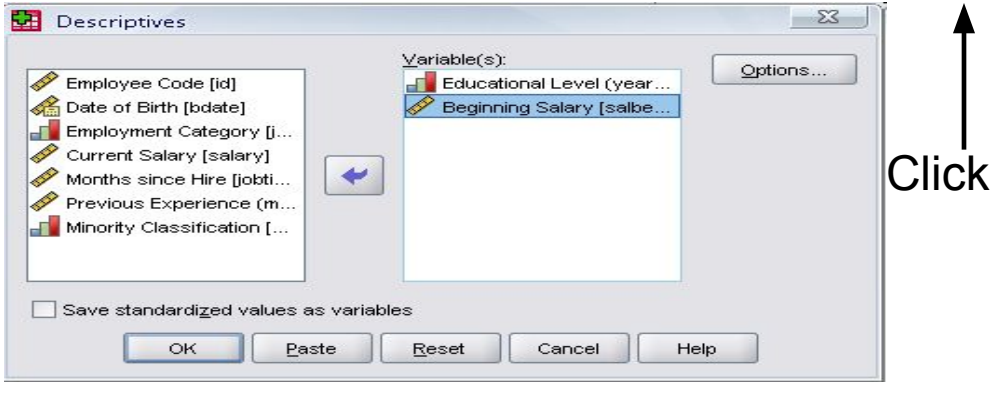
Answer


*Output1 [Document1] – SPSS Viewer
File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help
Output
Log
Frequencies
Title
Notes
Active Dataset
Statistics
Minority Classification
Pie Chart
Frequencies
[DataSet1] C:
Statistics
Minority Classification
N Valid 474
Missing 0
Click
Minority Classification
Frequency Percent Valid Percent Cumulative Percent
Valid No 370 78.1 78.1 78.1
Yes 104 21.9 21.9 100.0
Total 474 100.0 100.0
SPSS Processor is ready
H: 117, W: 431 pt.


Minority Classification
No
Yes

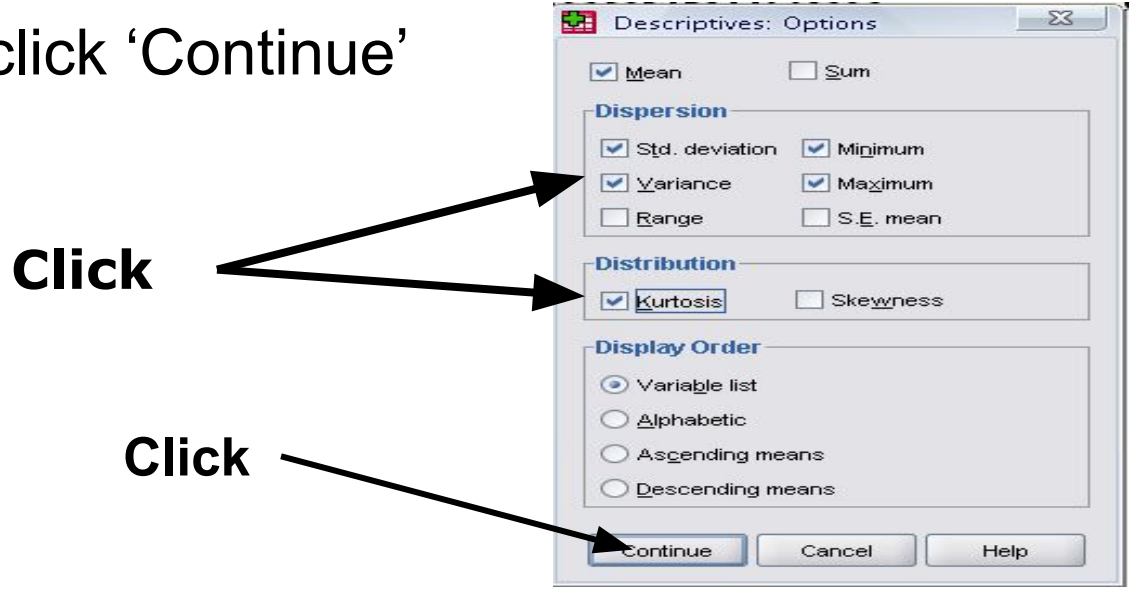
Descriptives

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



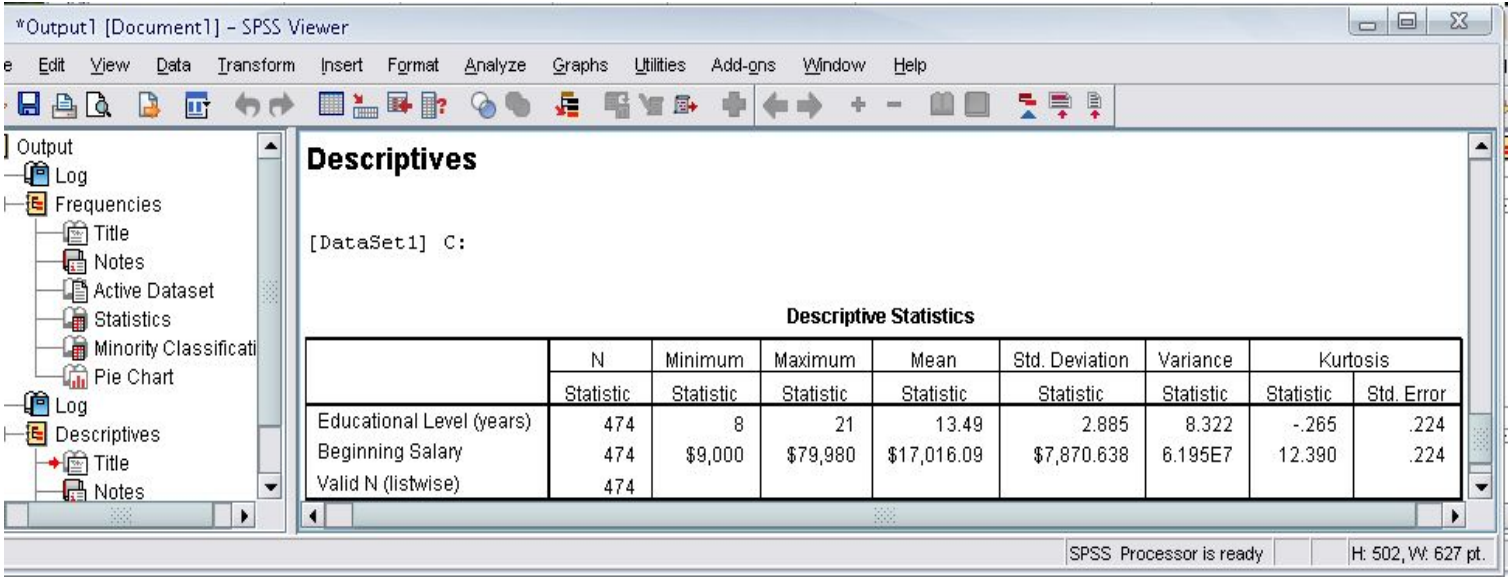
Descriptives

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



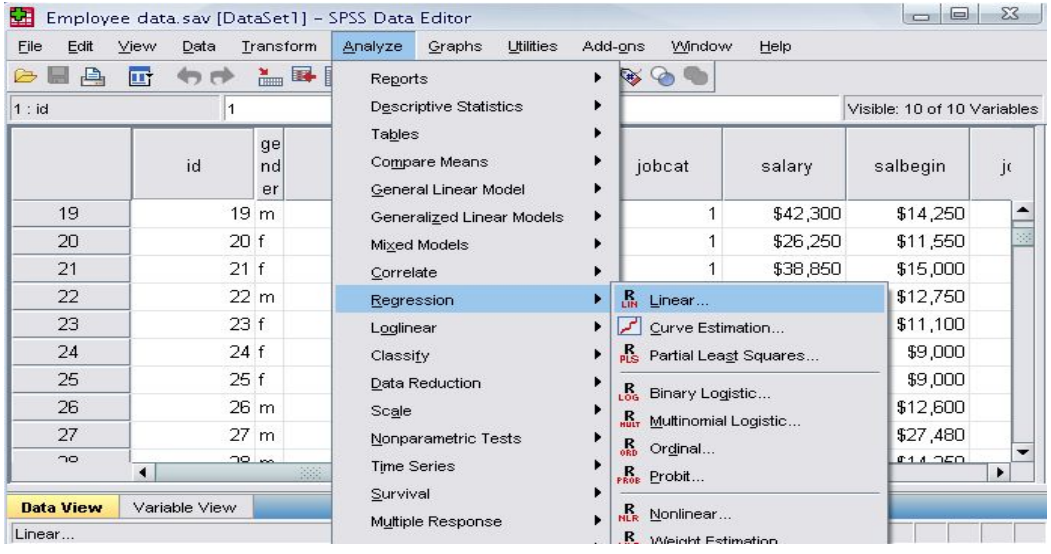
Descriptives

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



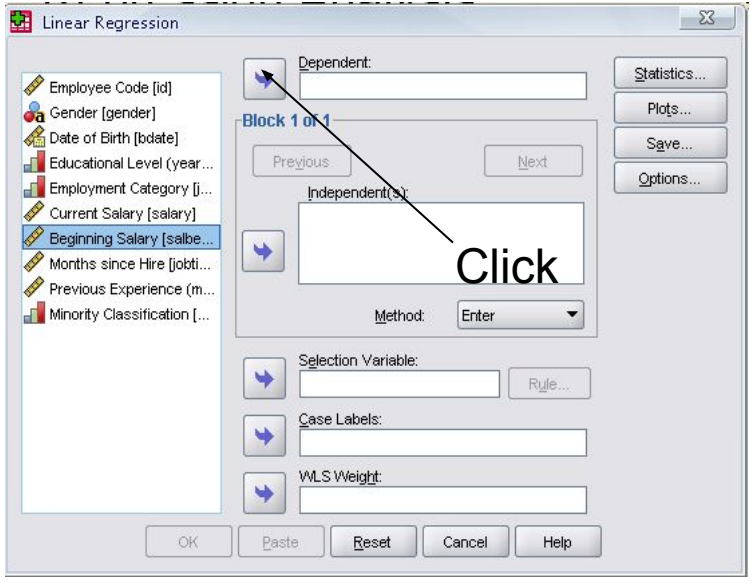
Regression Analysis

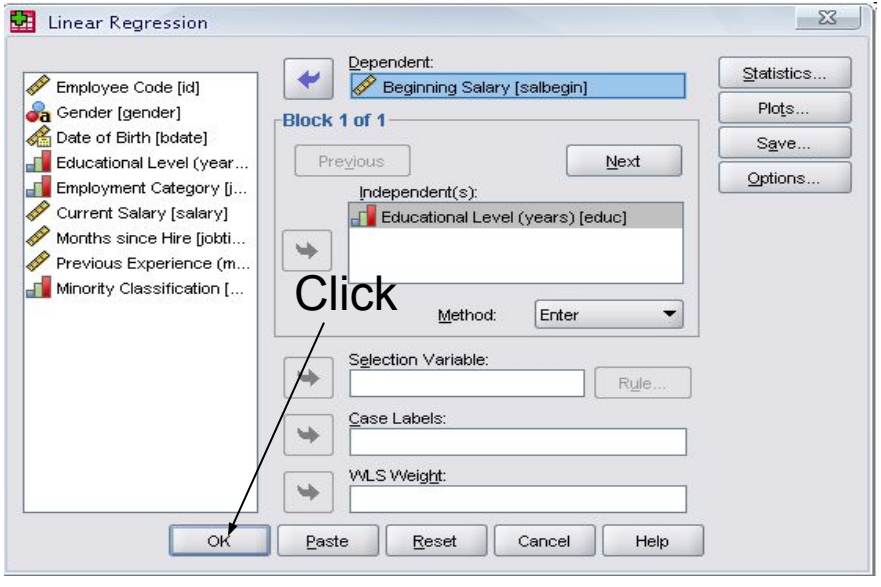
- Click ‘Analyze,’ ‘Regression,’ then click ‘Linear’ from the main menu.



Regression Analysis

- For example let's analyze the model $\text{salbegin} = \beta_0 + \beta_1 \text{edu} + \varepsilon$
- Put 'Beginning Salary' as Dependent and 'Educational Level' as Independent.





Regression Analysis

- Clicking OK gives the result

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.633[a]	.401	.400	$6,098.259

a. Predictors: (Constant), Educational Level (years)

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.175E10	1	1.175E10	315.897	.000[a]
	Residual	1.755E10	472	3.719E7		
	Total	2.930E10	473			

a. Predictors: (Constant), Educational Level (years)

b. Dependent Variable: Beginning Salary

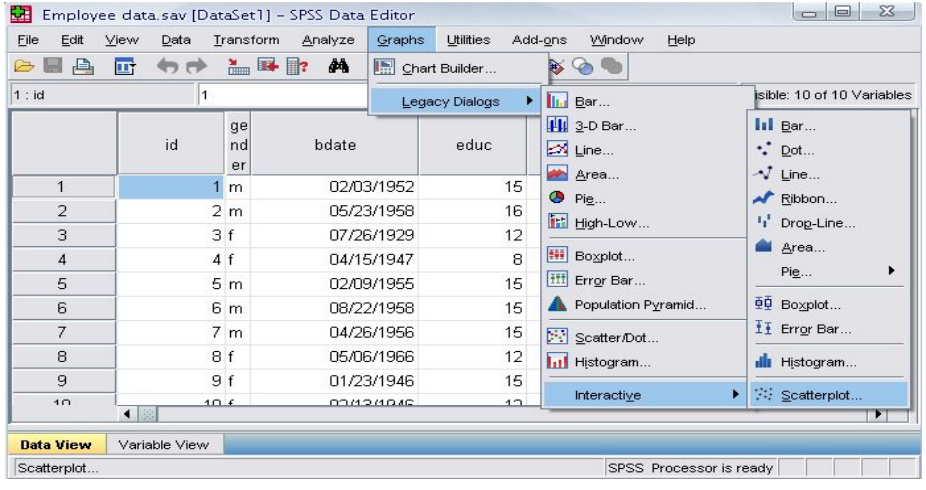
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-6290.967	1340.920		-4.692	.000
	Educational Level (years)	1727.528	97.197	.633	17.773	.000

a. Dependent Variable: Beginning Salary

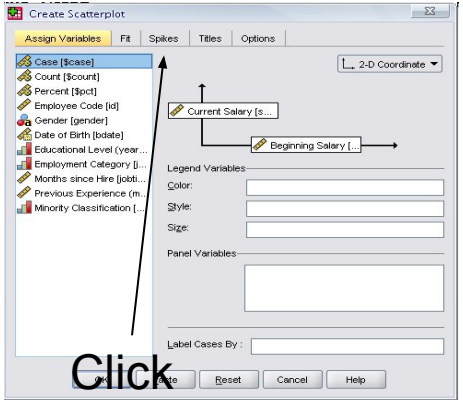
Plotting the regression line

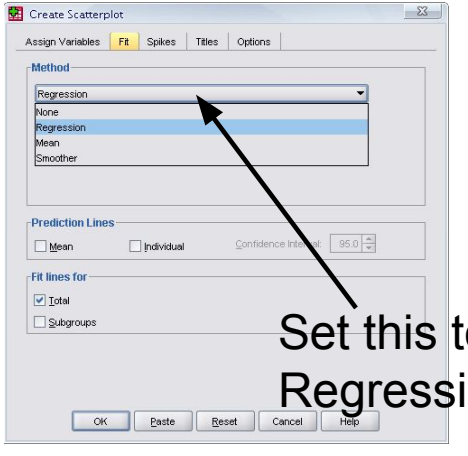
- Click ‘Graphs,’ ‘Legacy Dialogs,’ ‘Interactive,’ and ‘Scatterplot’ from the main menu.



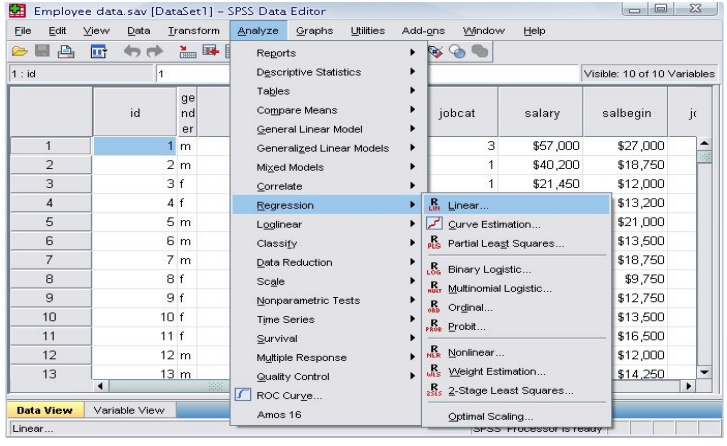
Plotting the regression line

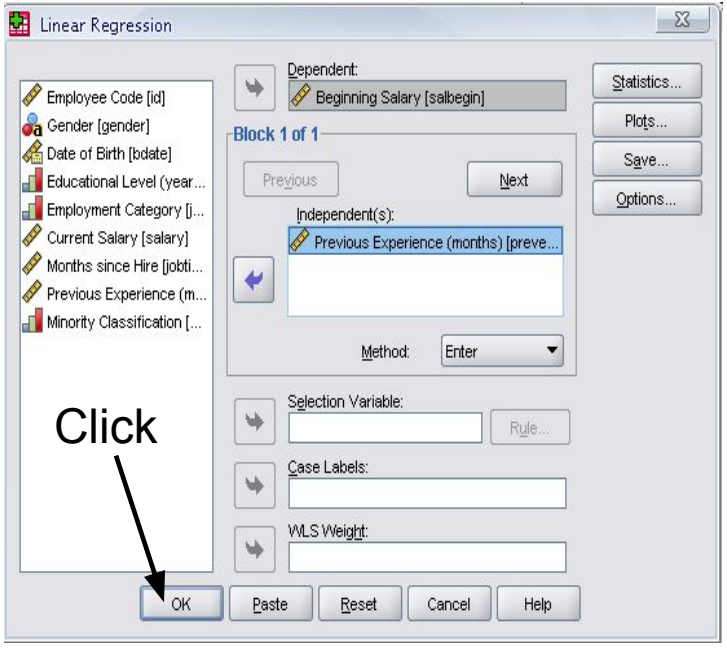
- Drag ‘Current Salary’ into the vertical axis box and ‘Beginning Salary’ in the horizontal axis box.
- Click ‘Fit’ bar. Make sure the Method is regression in the Fit box. Then click ‘OK’.





Answer


Employee data.sav [DataSet1] – SPSS Data Editor
File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help
Reports
Descriptive Statistics
Tables
Compare Means
General Linear Model
Generalized Linear Models
Mixed Models
Correlate
Regression
Loglinear
Classify
Data Reduction
Scale
Nonparametric Tests
Time Series
Survival
Multiple Response
Quality Control
ROC Curve...
Amos 16
Linear...
Curve Estimation...
Partial Least Squares...
Binary Logistic...
Multinomial Logistic...
Ordinal...
Probit...
Nonlinear...
Weight Estimation...
2-Stage Least Squares...
Optimal Scaling...
Visible: 10 of 10 Variables
id
jobcat
salary
salbegin
Data View
Variable View


Linear Regression
Employee Code [id]
Gender [gender]
Date of Birth [bdate]
Educational Level (year...
Employment Category [j...
Current Salary [salary]
Months since Hire [jobti...
Previous Experience (m...
Minority Classification [...
Dependent:
Beginning Salary [salbegin]
Block 1 of 1
Previous
Next
Independent(s):
Previous Experience (months) [preve...
Method:
Enter
Statistics...
Plots...
Save...
Options...
Selection Variable:
Rule...
Case Labels:
WLS Weight:
Click
OK
Paste
Reset
Cancel
Help

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.045[a]	.002	.000	$7,870.942

a. Predictors: (Constant), Previous Experience (months)

b. Dependent Variable: Beginning Salary

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.969E7	1	5.969E7	.964	.327[a]
	Residual	2.924E10	472	6.195E7		
	Total	2.930E10	473			

a. Predictors: (Constant), Previous Experience (months)

b. Dependent Variable: Beginning Salary

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16690.478	490.646		34.017	.000
	Previous Experience (months)	3.397	3.460	.045	.982	.327

a. Dependent Variable: Beginning Salary