

IENG484  
Quality Engineering  
Lab 1

**RESEARCH ASSISTANT**

SHADI BOLOUKIFAR

# SPSS

(Statistical package for social science)

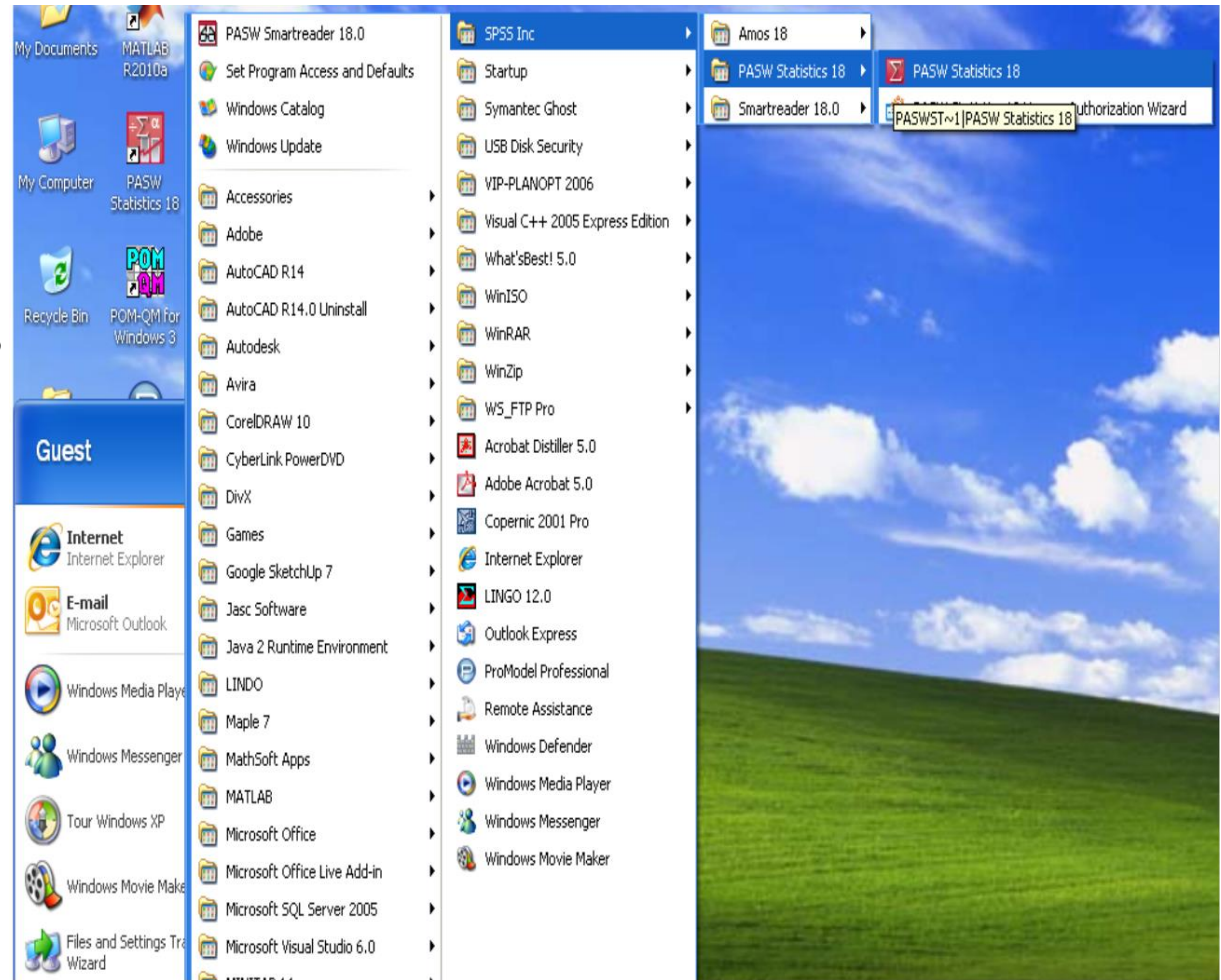
Originally is acronym of  
Statistical Package for the Social Science

but,

now it stands for  
Statistical Product and Service Solutions.

# Opening SPSS

- Go to  
START → PROGRAMS

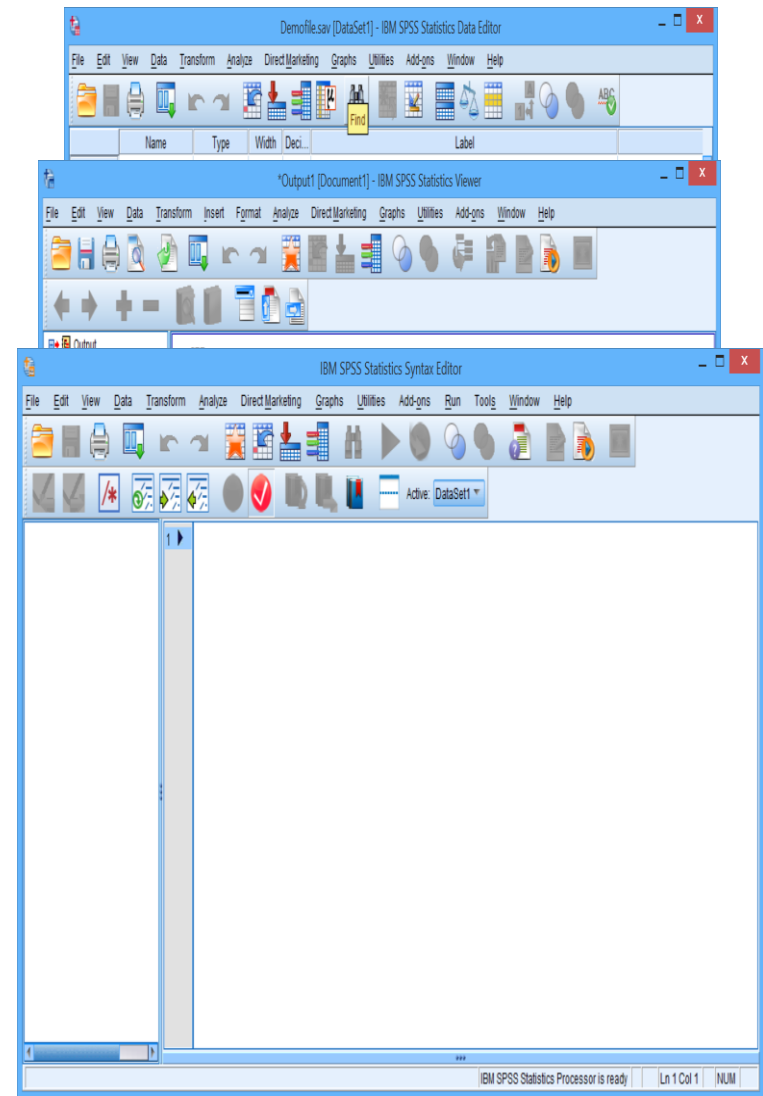


- Select the red box that says SPSS on the top.



# The SPSS windows

1. The Data Editor Window  
(.sav)  
Shows data in two forms:  
Data view and Variable view
2. The Output Viewer Window  
(.spv)  
Shows results of data analysis
3. The Syntax Editor Window  
(.sps)  
Shows the syntax command  
script. This is also where you can  
type and run your own syntax  
commands.





# Data View

- This view displays the actual data values or defined value labels.
- Many of the features of Data View are similar to the features in spreadsheet applications.
- Rows are cases: Each row represents a case or an observation.
- Columns are variables: Each column represents a variable or characteristic that is being measured.

# Data View (cont.)

The screenshot shows the IBM SPSS Statistics Data Editor window in Data View. The window title is "Untitled2 [DataSet3] - IBM SPSS Statistics 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, editing, and analysis. The main area is a grid with 20 columns labeled "var" and 37 rows numbered 1 to 37. The status bar at the bottom right indicates "Visible: 0 of 0 Variables".

Annotations with blue arrows point to the following elements:

- Columns: variables**: Points to the column headers.
- Rows: cases**: Points to the row numbers.
- Under Data View**: Points to the "Data View" tab at the bottom left.

The "Data View" tab is highlighted in yellow, and the "Variable View" tab is visible next to it. The status bar at the bottom right reads "IBM SPSS Statistics Processor is ready".

# Variable View

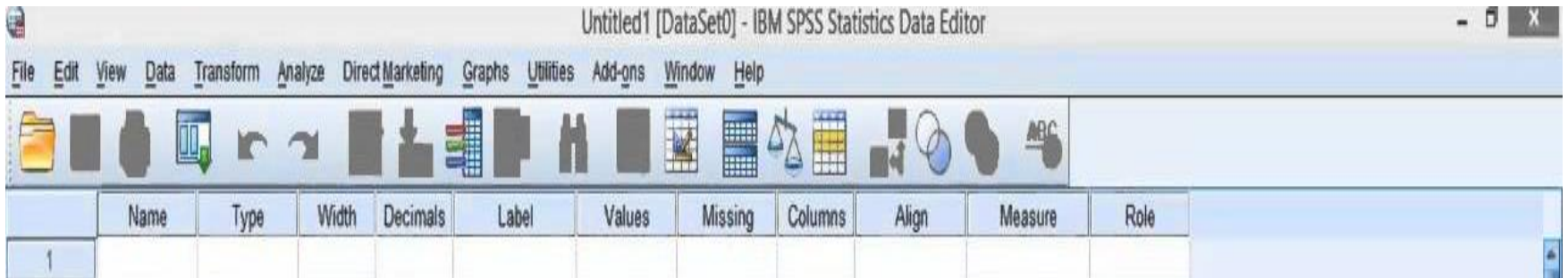
- This view displays variable definition information, including defined variable and value labels, data type (for example, string, date, or numeric), measurement level (nominal, ordinal, or scale), and user-defined missing values.
- Variable View contains descriptions of the attributes of each variable in the data file.
- In Variable View:
  - Rows are variables.
  - Columns are variable attributes.



# Variable View (cont.)

- 10 characteristics are used to define a variable:

Name	Values
Type	Missing
Width	Column
Decimals	Align
Label	Measure



## Defining variables

Variable.	Some notes	For example for "gender"
Name	<ul style="list-style-type: none"> <li>- Up to 8 characters, no spaces</li> <li>- Could relate to the question number (e.g. Q1) or be descriptive (e.g. Gender)</li> </ul>	Gender
Type	e.g. numeric, date, string (alphanumeric or letters)	Numeric
Width	The number of characters that can be entered	2
Decimals		0
Label	Description of the variable (i.e. a longer description of the variable name)	Gender of respondent
Values	<ul style="list-style-type: none"> <li>- Labels that explain the values - Numeric values are preferable</li> <li>- It is common to define 99 as a missing value (i.e. if a respondent failed to answer a question)</li> <li>- Be consistent e.g. always 1 = no, 2 = yes</li> </ul>	1 = male 2 = female 99 = missing
Missing	Optional: if you declare that a value is "missing", SPSS will omit the values from analysis	99
Columns	Defines the width of the column in <i>data view</i>	7
Align	Left, right or centre alignment of data in cells	Right
Measure	<b>Nominal, ordinal or scale (interval/ratio)</b>	<b>Nominal</b>

# Enter Value

Based on your code book!

Name	Type	Width	Decimals	Label	Values	Missing	Colour
Q01	Numeric	8	0	Age	None	None	8

Value Labels dialog box:

Value:

Label:

Value Labels list:

- 1 = "12 years old or young"
- 2 = "13 years"

Buttons: Add, Change, Remove, Spelling..., OK, Cancel, Help

# Measure

The last column needing to be defined is 'Measure'. Here you must decide if a variable is:

1. Nominal
2. Ordinal
3. Scale

# 1. Nominal variables

- A Nominal (sometimes also called categorical) variable is one whose values vary in categories. It is not possible to rank the categories created.

e.g. Gender varies in that an individual is either categorized as "male" or "female".

## 2. Ordinal variables

An Ordinal variable is one where it is possible to rank the categories or put them in an order. The intervals between the categories used are not defined. e.g. preference by an individual could be ranked:

1. dislike a lot
2. dislike
3. neither dislike or like
4. like
5. like a lot

# 3. Scale variables

- An Interval variable is one where the measurement scale uses the same interval between one measurement and the next.
- They allow us not only to rank order the items that are measured but also to quantify and compare the magnitudes of differences between them. We can say that the temperature of  $40^{\circ}$  C is higher than  $30^{\circ}$  C, and an increase from  $20^{\circ}$  C to  $40^{\circ}$  C is twice as much as the increase from  $30^{\circ}$  C to  $40^{\circ}$  C.

# Steps of Entering variables

The screenshot shows the IBM SPSS Statistics Data Editor window in Variable View. The window title is "Untitled2 [DataSet3] - IBM SPSS Statistics 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, editing, and analysis. The main area is a grid with columns: Name, Type, Width, Decimals, Label, Values, Missing, Columns, Align, Measure, and Role. The first row contains the following data: Name: Q01, Type: Numeric, Width: 8, Decimals: 0, Label: Age, Values: None, Missing: None, Columns: 8, Align: Right, Measure: Ordinal, Role: Input. Four blue ovals with arrows point to specific cells in the grid: "1. Click this Window" points to the Variable View tab at the bottom; "2. Type variable name" points to the Name cell (Q01); "3. Type: numeric or string" points to the Type cell (Numeric); "4. Description of variable" points to the Label cell (Age). A blue box on the right contains a list of steps and a note.

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Q01	Numeric	8	0	Age	None	None	8	Right	Ordinal	Input
2											
3											
4											
5											
6											
7											
8											
9											
13											
14											
15											
16											
17											
18											
19											
20											
21											
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24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											

1. Click this Window
2. Type variable name
3. Type: numeric or string
4. Description of variable

**NOTE:** Variable name can be 64 bytes long, and the first character must be a letter or one of the characters @, #, or \$.

3. Type: Numeric, string, etc.
4. Label: description of variables.



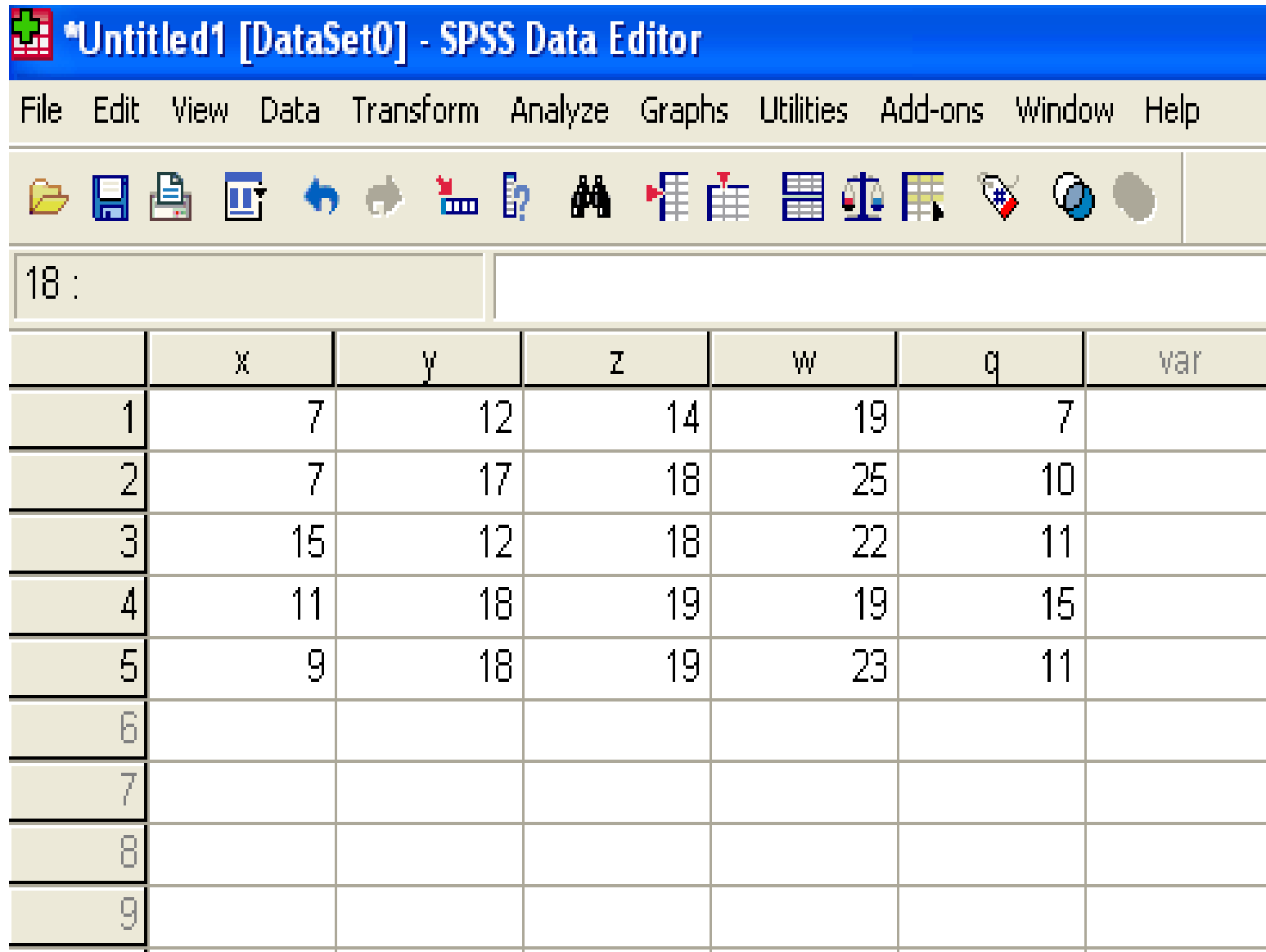
# Example 1

Please enter the following data into SPSS

Weight Percentage of Cotton	Observed Tensile Strength				
x	7	7	15	11	9
y	12	17	12	18	18
z	14	18	18	19	19
w	19	25	22	19	23
q	7	10	11	15	11



# Data View



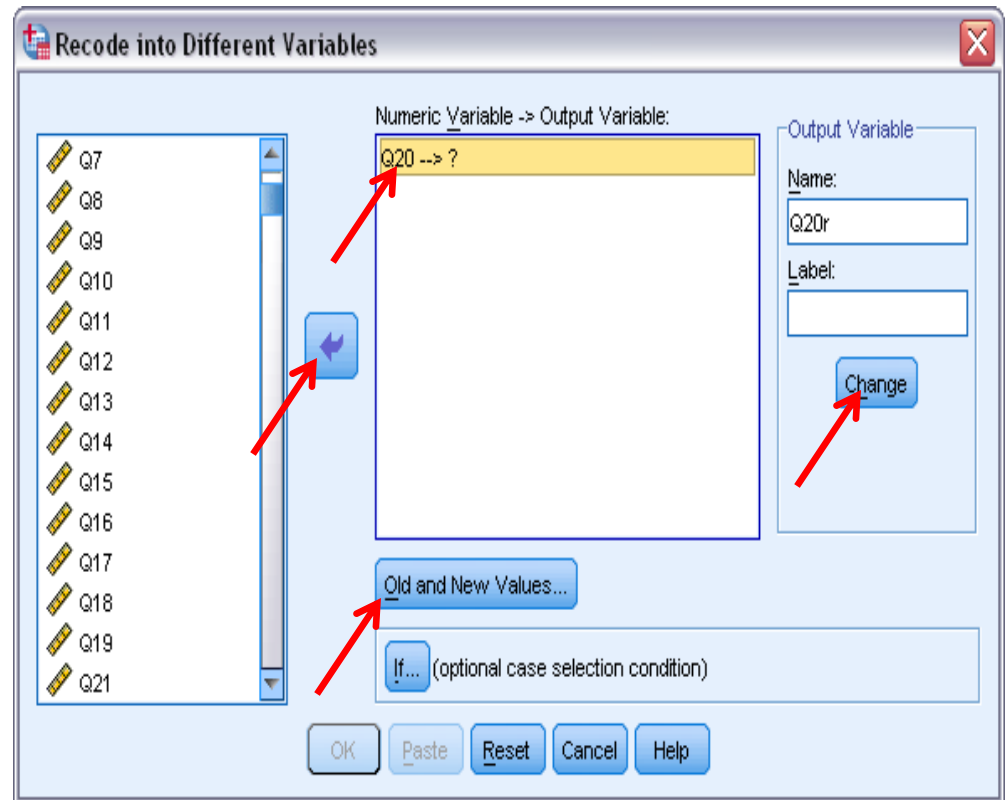
The screenshot shows the SPSS Data Editor interface. The title bar reads '\*Untitled1 [DataSet0] - SPSS Data Editor'. The menu bar includes File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains various icons for file operations and data analysis. The main window displays a table with 9 rows and 7 columns. The first row is highlighted. The columns are labeled x, y, z, w, q, and var. The data values are as follows:

	x	y	z	w	q	var
1	7	12	14	19	7	
2	7	17	18	25	10	
3	15	12	18	22	11	
4	11	18	19	19	15	
5	9	18	19	23	11	
6						
7						
8						
9						

# Variable transformation

- Recode variables

1. Select Transform  
Recode into Different Variables →
2. Select variable that you want to transform (e.g. Q20): we want  
1= Yes and 0 = No
3. Click Arrow button to put your variable into the right window
4. Under Output Variable: type name for new variable and label, then click Change
5. Click Old and New Values

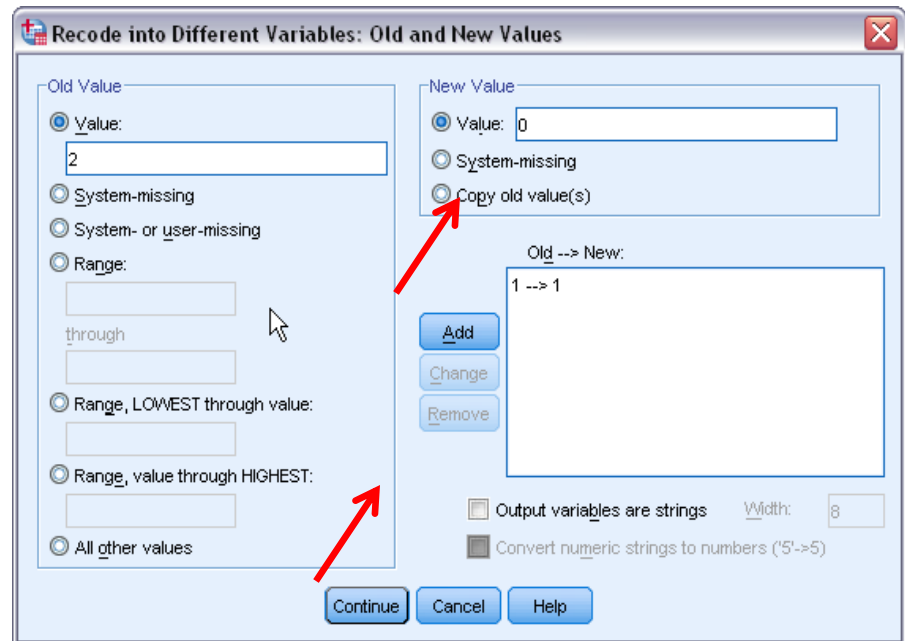


# Continue

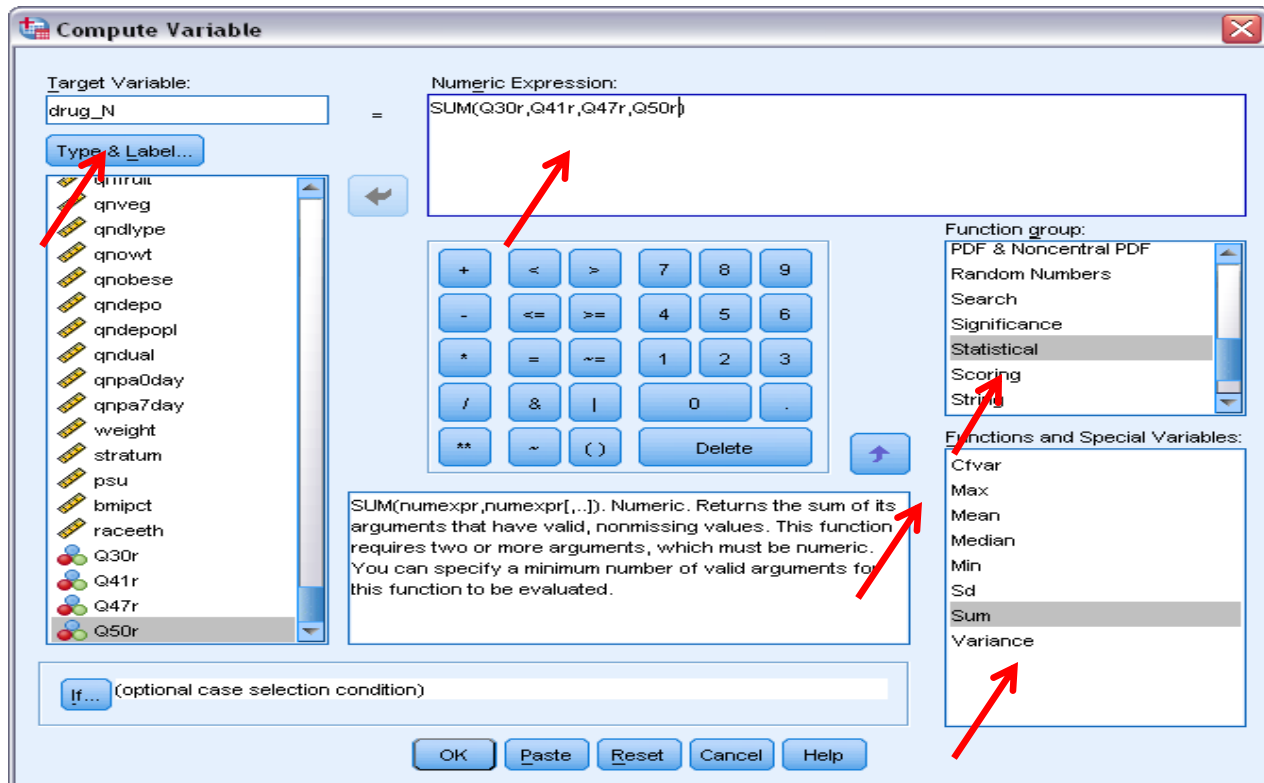
6. Type 1 under Old Value and 1 under New Value, click Add. Then type 2 under Old Value, and 0 under New Value, click Add.

7. Click Continue after finish all the changes.

8. Click Ok



# Compute summation



## Example 2: Getting sum and average

- Add another column to your existing data set by using **Transform Function**. This new column should contain the summation of each cases values.

# Sort cases

- Sort cases by variables: Data → Sort Cases
- You can use Sort Cases to find missing.

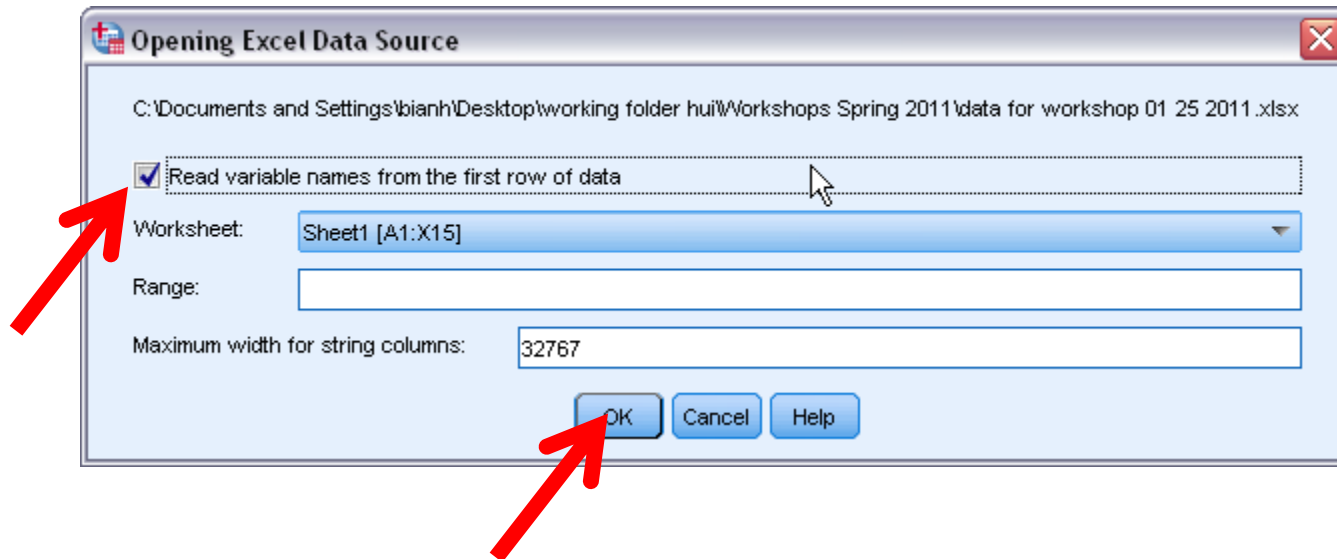
The screenshot shows the IBM SPSS Statistics Data Editor window with a data grid and the Sort Cases dialog box open. The data grid has columns labeled Q1 through Q28 and rows numbered 1 through 37. A red arrow points to the Q1 column header. The Sort Cases dialog box is titled "Sort Cases" and has a "Sort by:" list containing Q1 (A), Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, and Q10. A red arrow points to Q1 (A) in the list. The "Sort Order" section has radio buttons for "Ascending" (selected) and "Descending". Buttons for "OK", "Paste", "Reset", "Cancel", and "Help" are at the bottom of the dialog.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	
1	.	2	.	.	.	.	.	2	5	1	1	1	1	1	1	2	1	1	1	1	2	2	1	2	2	1	1	.	
2	.	2	2	.	.	.	.	2	5	2	3	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
3	.	2	4	.	.	.	.	1	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	
4	.	.	.	.	.	.	.	2	4	5	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	
5	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	
6	.	1	4	2	C	.	.	1	4	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
7	.	2	4	1	.	.	.	1	5	2	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
8	.	.	.	.	.	.	.	2	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
9	.	2	.	.	.	.	.	1	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
10	.	.	.	.	.	.	.	2	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
11	.	.	.	.	.	.	.	2	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
12	.	1	4	2	.	.	.	2	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
13	.	1	3	2	E	.	.	6	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
14	.	.	.	.	.	.	.	2	4	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
15	.	2	.	.	.	.	.	1	3	1	1	5	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
16	.	.	.	.	.	.	.	1	2	3	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
17	.	1	.	.	.	.	.	1	2	2	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
18	.	.	.	.	.	.	.	1	4	3	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
19	.	2	.	.	.	.	.	2	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
20	.	.	.	.	.	.	.	1	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
21	.	.	.	.	.	.	.	2	3	5	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
22	.	.	.	.	.	.	.	1	3	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
23	.	.	.	.	.	.	.	2	4	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
24	.	1	.	.	.	.	.	1	4	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
25	.	.	.	.	.	.	.	2	2	5	5	5	5	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
26	.	1	2	2	C	.	.	1	4	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
27	.	1	3	2	C	.	.	2	5	5	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
28	.	.	.	.	.	.	.	2	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
29	.	1	.	.	.	.	.	4	5	2	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
30	.	1	.	.	.	.	.	2	4	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
31	.	2	.	.	.	.	.	2	5	1	1	3	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
32	.	.	.	.	.	.	.	2	4	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
33	.	.	.	.	.	.	.	.	1	3	4	3	4	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
34	.	1	.	.	.	.	.	2	4	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
35	.	2	4	.	C	.	.	1	1	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
36	.	1	.	.	.	.	.	1	5	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
37	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	



# Import Data from Excel

- Select File → Open → Data
- Choose **Excel** as file type
- Select the file you want to import
- Select Read variable name from first row
- Then click Open



# Example 3: Importing Data

Please enter the following data in an Excel file and **Import** it into a SPSS file.

Weight Percentage of Cotton	Observed Tensile Strength				
x	7	7	15	11	9
y	12	17	12	18	18
z	14	18	18	19	19
w	19	25	22	19	23
q	7	10	11	15	11

# Basic statistical analysis

- Descriptive statistics
  - Purposes:
    1. Find wrong entries
    2. Have basic knowledge about the sample and targeted variables in a study
    3. Summarize data

**Analyze** → **Descriptive statistics** → **Descriptives**

# \*Untitled2 [DataSet1] - SPSS Data Editor

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



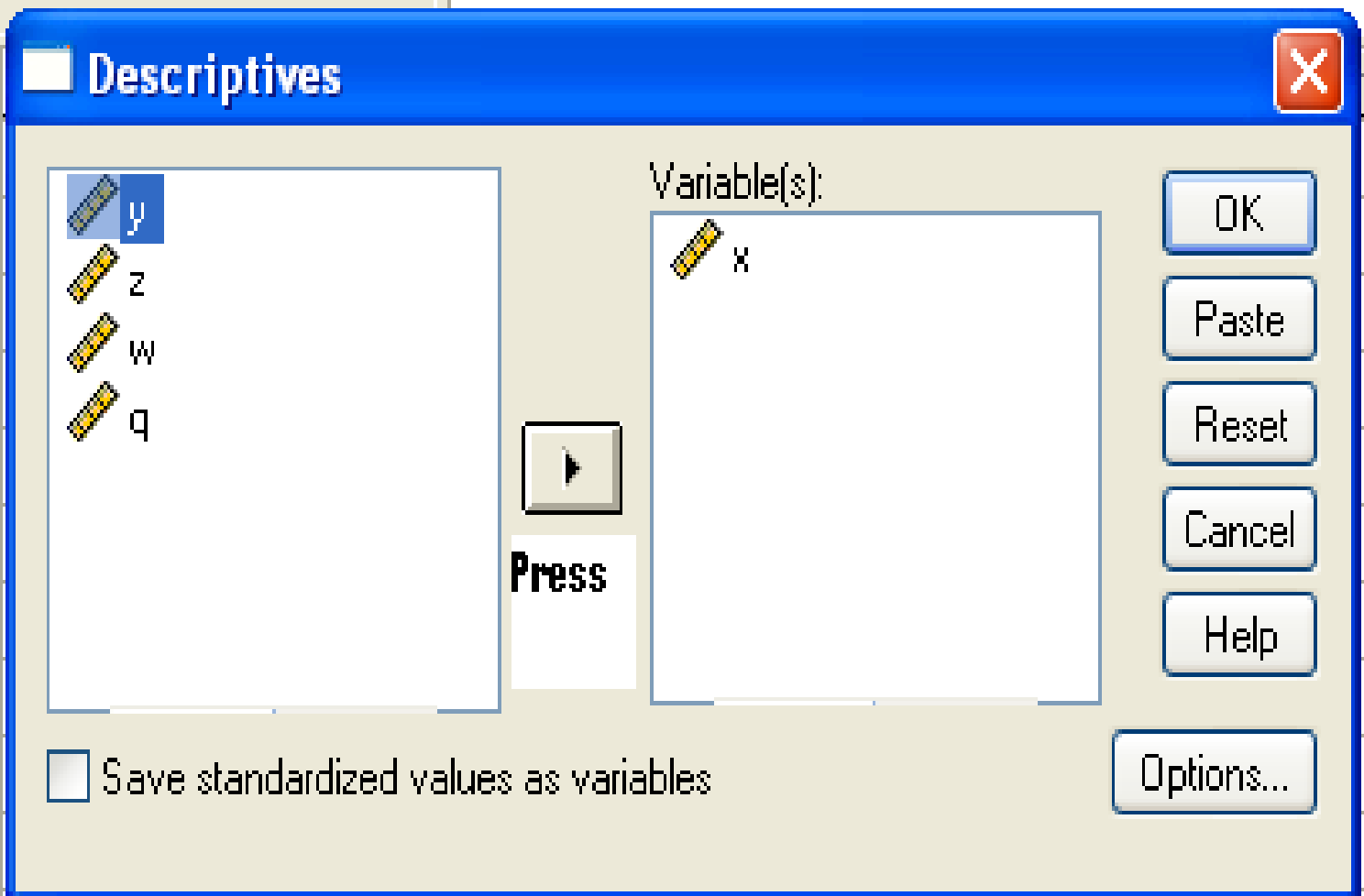
6 : q

	x	y
1	7	1
2	7	1
3	15	1
4	11	1
5	9	1
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

- 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 ▶
- Missing Value Analysis... ▶
- Complex Samples ▶
- Quality Control ▶
- ROC Curve... ▶

- Frequencies...
- Descriptives...**
- Explore...
- Crosstabs...
- Ratio...
- P-P Plots...
- Q-Q Plots...

	var
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	



## Descriptives: Options



Mean

Sum

Continue

### Dispersion

Std. deviation

Minimum

Cancel

Variance

Maximum

Help

Range

S.E. mean

### Distribution

Kurtosis

Skewness

### Display Order

Variable list

Alphabetic

Ascending means

Descending means

# Result

The screenshot shows the SPSS Viewer interface. The title bar reads "Output1 [Document1] - SPSS Viewer". The menu bar includes File, Edit, View, Data, Transform, Insert, Format, Analyze, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains various icons for file operations and analysis. The left-hand pane shows a tree view with "Output" expanded to "Descriptive Statistics". The main window displays the following text:

```
DESCRIPTIVES  
VARIABLES=x y z w q  
/STATISTICS=MEAN STDDEV MIN MAX .
```

## Descriptives

[DataSet0]

	N	Minimum	Maximum	Mean	Std. Deviation
x	5	7	15	9.80	3.347
y	5	12	18	15.40	3.130
z	5	14	19	17.60	2.074
w	5	19	25	21.60	2.608
q	5	7	15	10.80	2.864
Valid N (listwise)	5				

# Example 4: Descriptive Analysis

- Please compute Descriptive Analysis on your data.

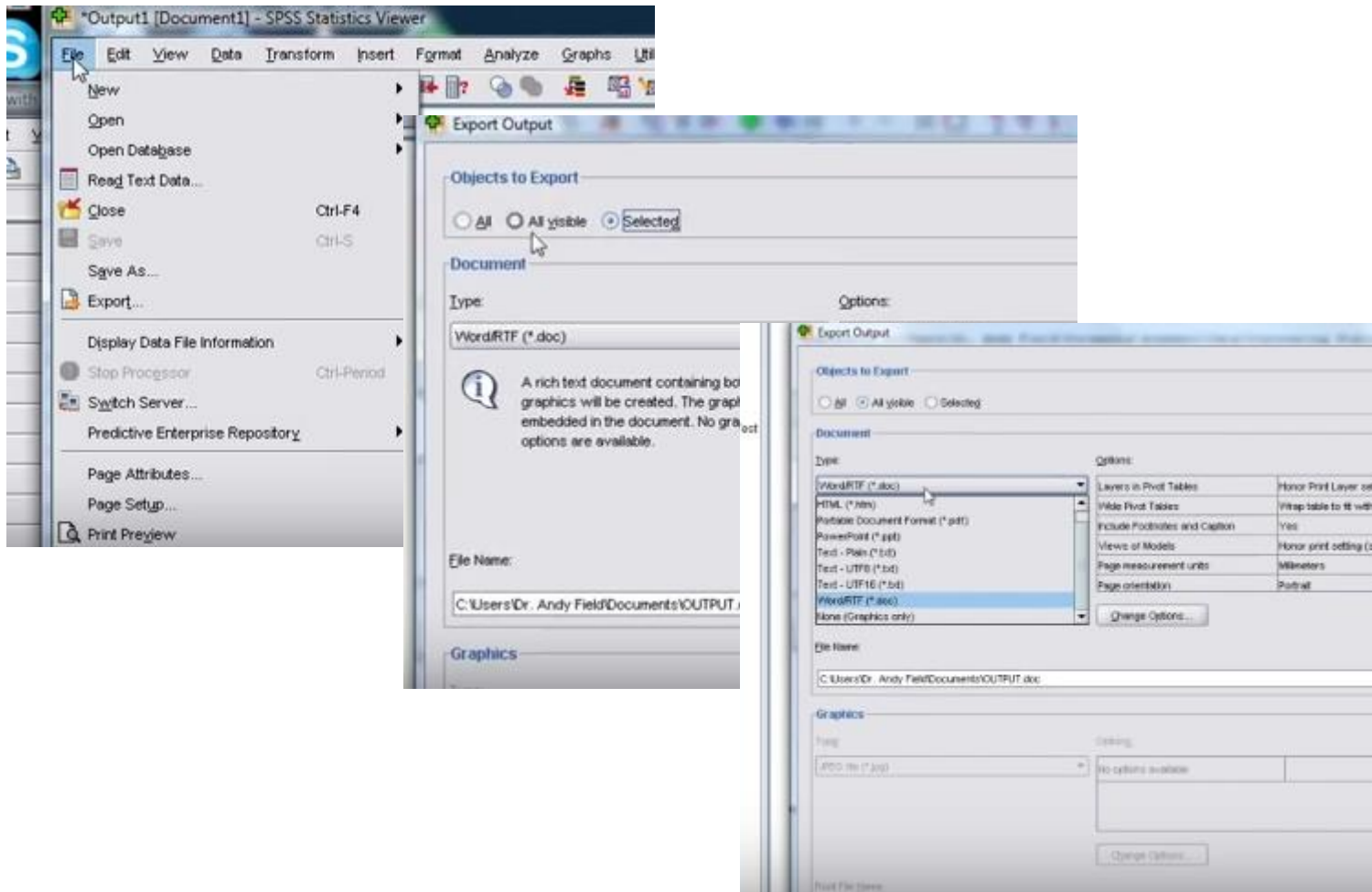
Weight Percentage of Cotton	Observed Tensile Stregth				
x	7	7	15	11	9
y	12	17	12	18	18
z	14	18	18	19	19
w	19	25	22	19	23
q	7	10	11	15	11



# Exporting Results to Excel

1. Click File → Save As
2. Point to the folder where you want to save the exported file.
3. Give it a File name.
4. Select Save as type = Excel 97 and later (\*.xls)
5. Click Save.

# Exporting Results to Word



# Example 5: Exporting Result

- Please **export** your existing out put to word and Excel.

# THANKS FOR YOUR ATTENTION

► For further information :

Office No. : B206

[Shadi.boloukifar@cc.emu.edu.tr](mailto:Shadi.boloukifar@cc.emu.edu.tr)