Directions for using SPSS

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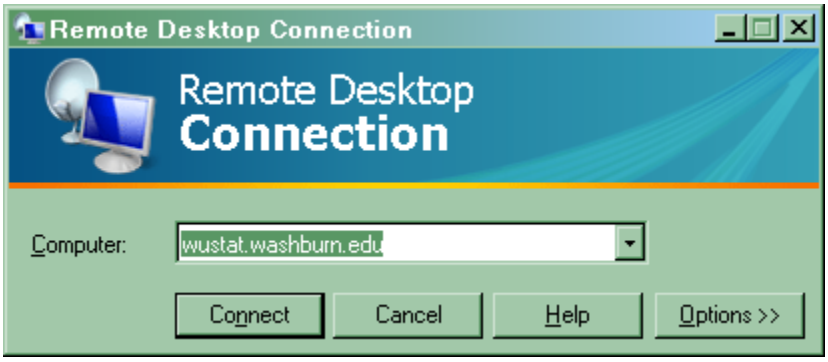
Accessing SPSS

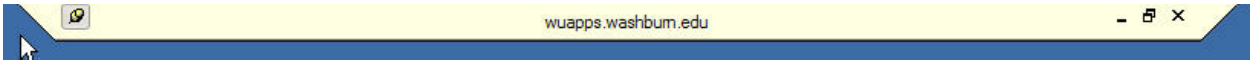
To connect to SPSS (either from Washburn's computer labs or your home computer that is connected to the internet) use the following procedure:

1. Run **Remote Desktop Connection**. (It is usually found under **Start> Programs> Accessories> Communications > Remote Desktop Connection**).
2. When the program asks you what computer to connect to type **wustat.washburn.edu** and click **Connect**.



3. When the computer asks for your **User Name** and **Password**, use the one that you use in order to log onto the computers at Washburn University.
4. After entering your User Name and Password click on the **OK** button.

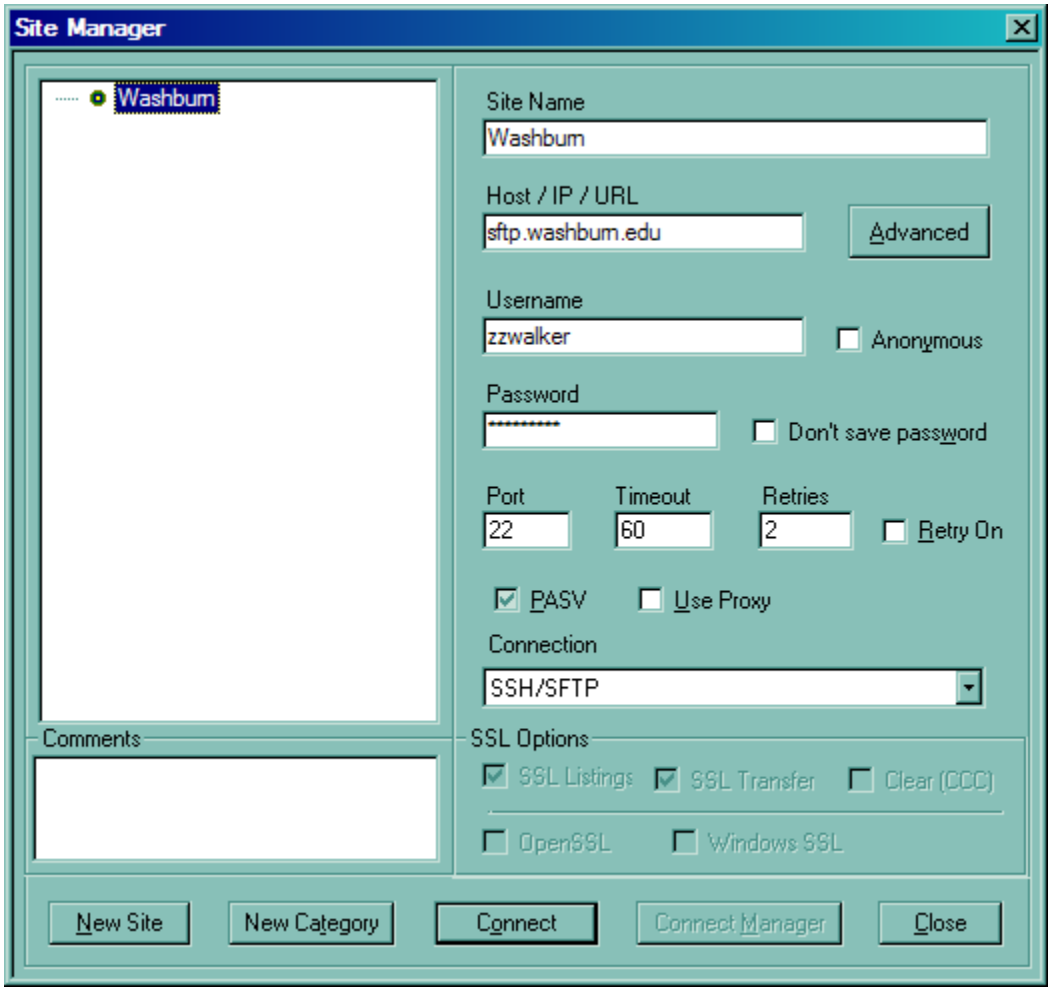
5. The WUStat Desktop will overly your existing desktop – including a new "Start" menu (see below). Note the unusual "bar" at the top with a "Minimize" (-) and "Close" (x) buttons. Pressing the minimize or pressing the <Alt><Tab> Keys will return you to your own Desktop. The "WUstat" Desktop is "minimized" to the taskbar. You can end the session by logging off.



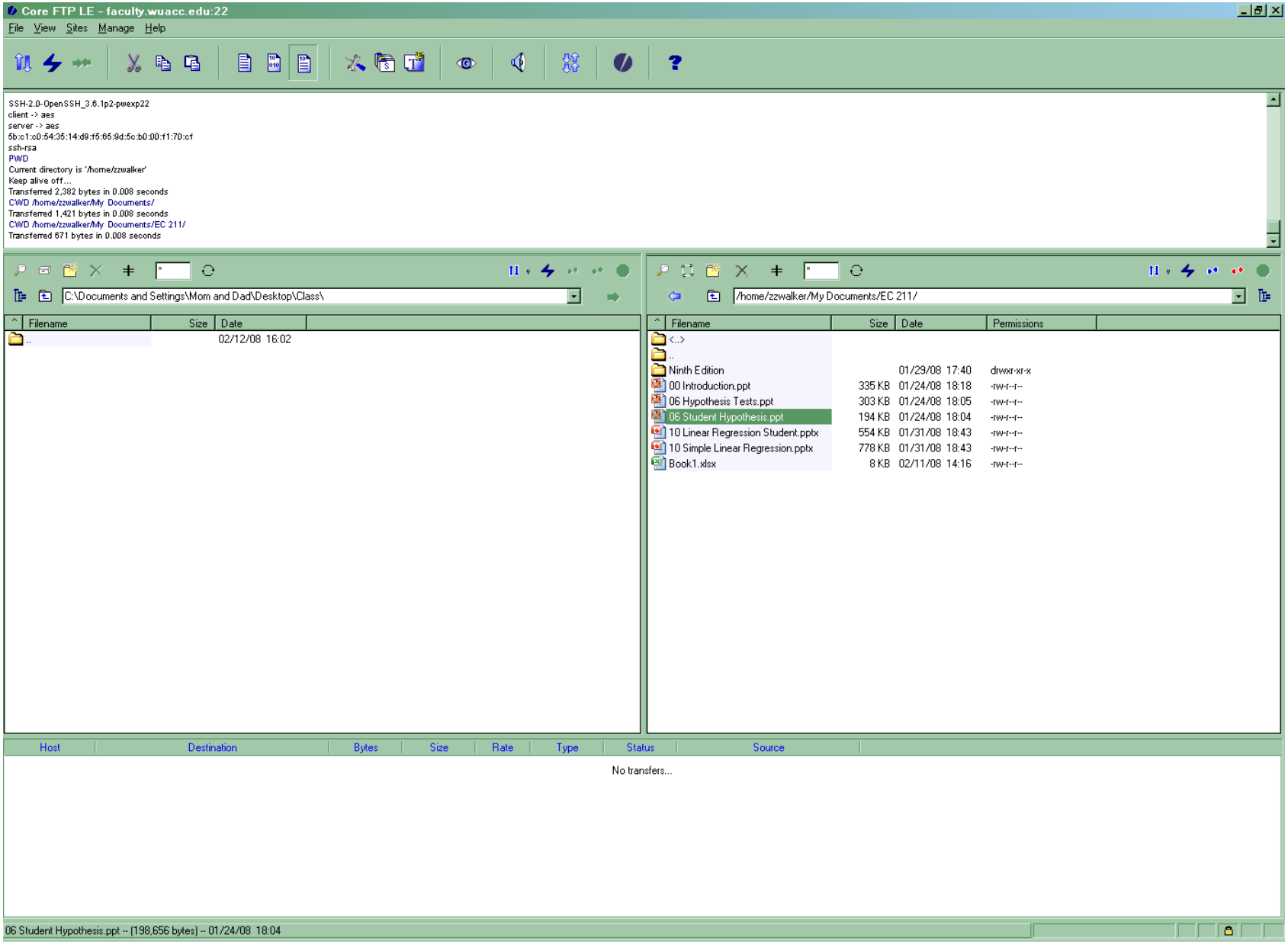
6. The SPSS program can be found under the start menu at **Start> All Programs > SPSS for Windows> SPSS 17.0 for Windows**.
7. When SPSS starts, you can then open an existing dataset or start a new one.

Transferring Files to n:\drive or Your Computer

1. Download Core FTP Light software from http://www.coreftp.com/download.html
2. Install the software and run the program
3. Select **File> Connect**.
4. Set-up the Washburn Connection as shown below except change the Host to **sftp.washburn.edu** and use your **Username** and **Password** that you use to log-on to Washburn computers.

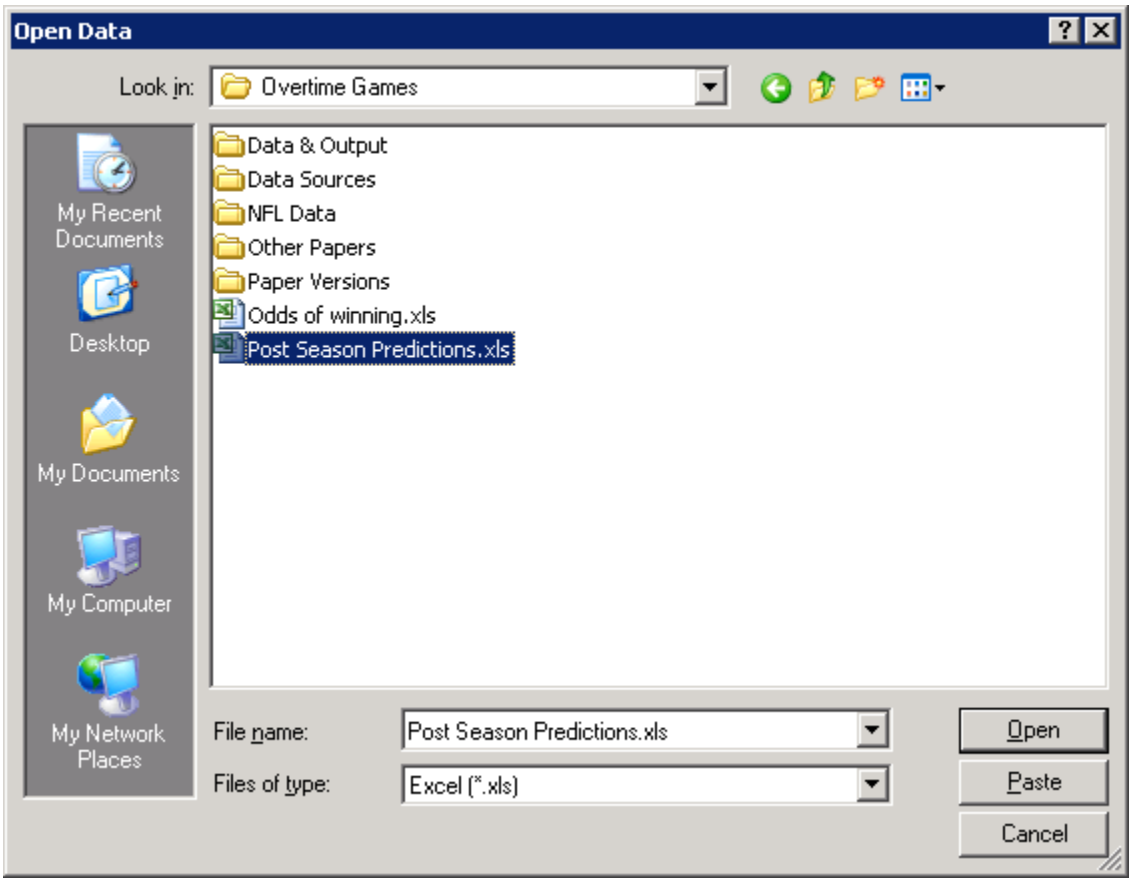


5. Select the **Connect** button.
6. The browser will appear as below. Make sure your directory is **/home/Username/**.
7. Your computer and their files are on the left hand side directory. Washburn's n:\drive is on the right hand side directory. You can transfer files from your home computer to Washburn's computer and vice versa.
8. Select the file that you wish to transfer and hit the **arrow** button in the center of the screen to send the file to either your computer or WUAD (n:\ drive).

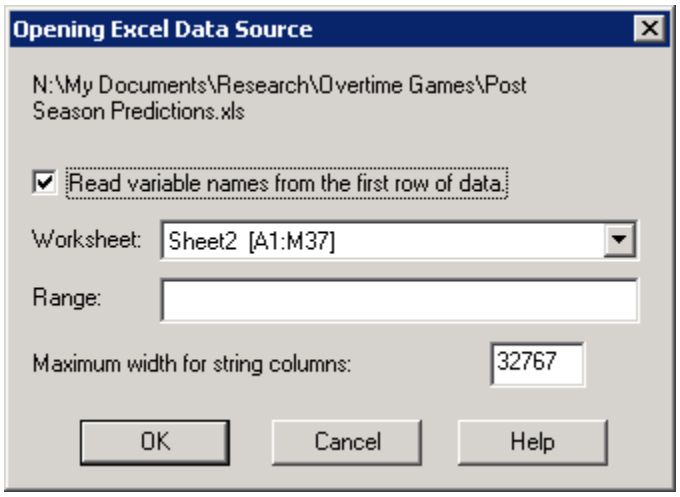

Core FTP LE - faculty.wuacc.edu:22
File View Sites Manage Help
SSH-2.0-OpenSSH_3.6.1p2-pwexp22
client -> aes
server -> aes
5b:c1:c0:54:35:14:d9:f5:65:9d:5c:b0:00:f1:70:cf
ssh-rsa
PWD
Current directory is '/home/zzwalker'
Keep alive off...
Transferred 2,382 bytes in 0.008 seconds
CWD /home/zzwalker/My Documents/
Transferred 1,421 bytes in 0.008 seconds
CWD /home/zzwalker/My Documents/EC 211/
Transferred 671 bytes in 0.008 seconds
C:\Documents and Settings\Mom and Dad\Desktop\Class\
Filename Size Date
.. 02/12/08 16:02
/home/zzwalker/My Documents/EC 211/
Filename Size Date Permissions
<..>
..
Ninth Edition 01/29/08 17:40 drwxr-xr-x
00 Introduction.ppt 335 KB 01/24/08 18:18 -rw-r--r--
06 Hypothesis Tests.ppt 303 KB 01/24/08 18:05 -rw-r--r--
06 Student Hypothesis.ppt 194 KB 01/24/08 18:04 -rw-r--r--
10 Linear Regression Student.pptx 554 KB 01/31/08 18:43 -rw-r--r--
10 Simple Linear Regression.pptx 778 KB 01/31/08 18:43 -rw-r--r--
Book1.xlsx 8 KB 02/11/08 14:16 -rw-r--r--
Host Destination Bytes Size Rate Type Status Source
No transfers...
06 Student Hypothesis.ppt -- (198,656 bytes) -- 01/24/08 18:04

Importing Data from another File Format

1. Make sure that the file you are attempting to access is saved on WUAD (N: drive).
2. In SPSS select, **File> Open> Data**.
3. Browse for the file that you wish to import into SPSS. Make sure that you changed the "**Files of type**" section at the bottom of the dialog, to the type of file that you wish to open, as illustrated below. (The program automatically looks only for SPSS files).
4. Click on the file you wish to import.
5. Select **Open**.

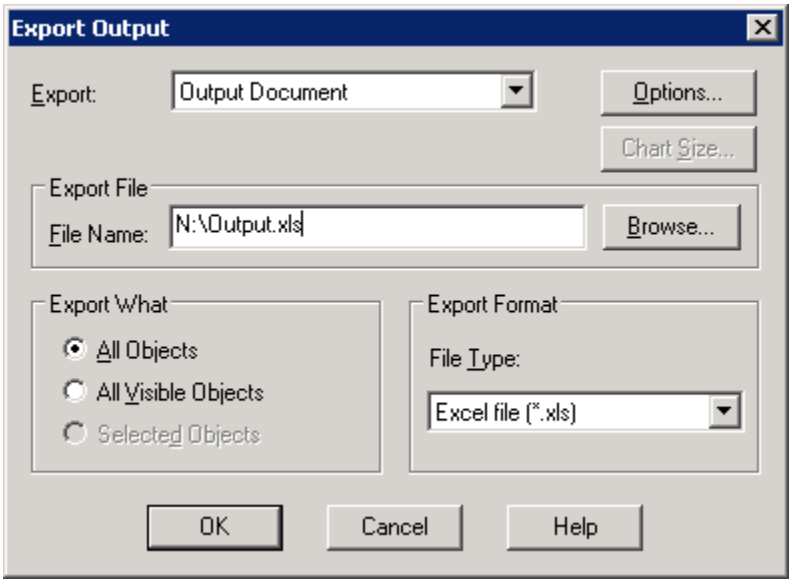


6. Make sure you check the box for **reading variable names from the first column** if the file has labels in the first column of data.
7. If you are importing a Microsoft Excel file that only has one sheet, then skip to step 9.
8. Select the worksheet and range.
9. Click **OK**.

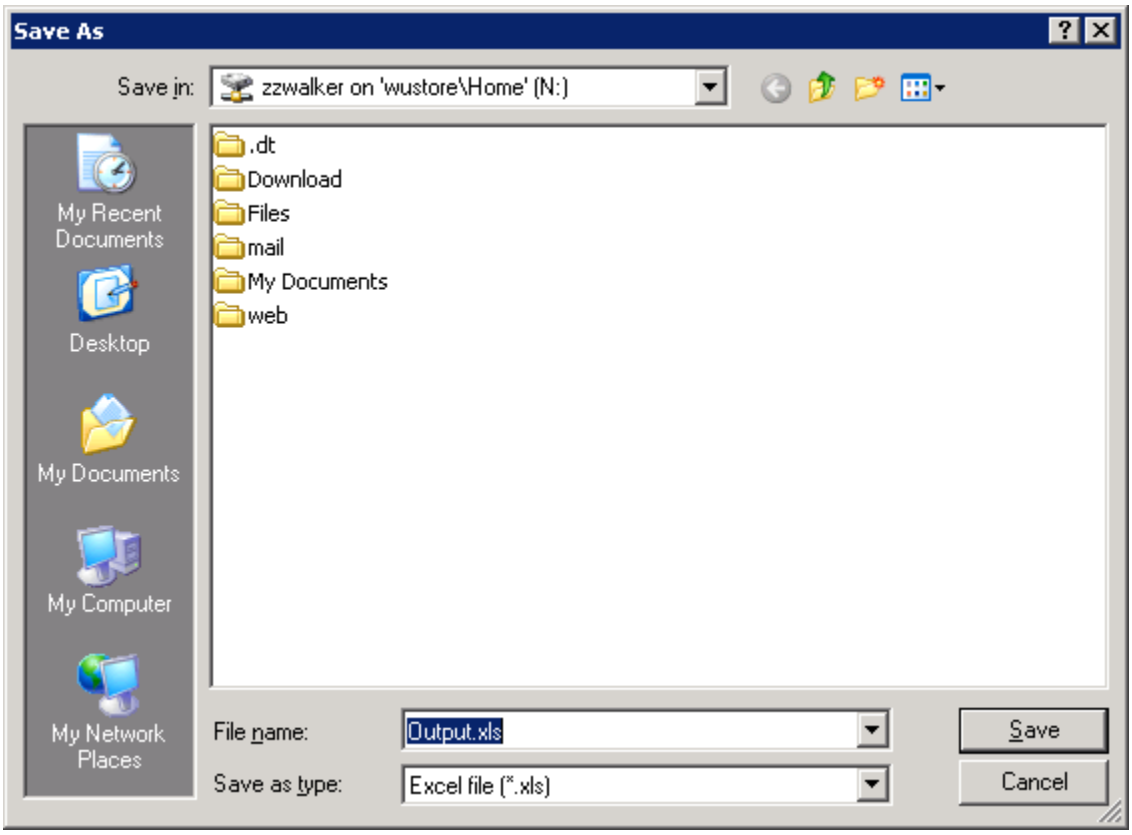


Exporting Output to Use in Word or Other Programs

1. You can export your statistical output to a number of formats that are useful for presenting your data. The available formats are Microsoft Excel, Microsoft Word, Html (for the Web), a Text file, Microsoft PowerPoint, or Portable Document Format (pdf).
2. Once you have completed your statistical analysis, select **File> Export**.
3. You will bring up the Export Output dialog box shown below.
4. In the **Export Format** box select the file type that you wish to save the output as.
5. In the **Export File** box select the **Browse** button.



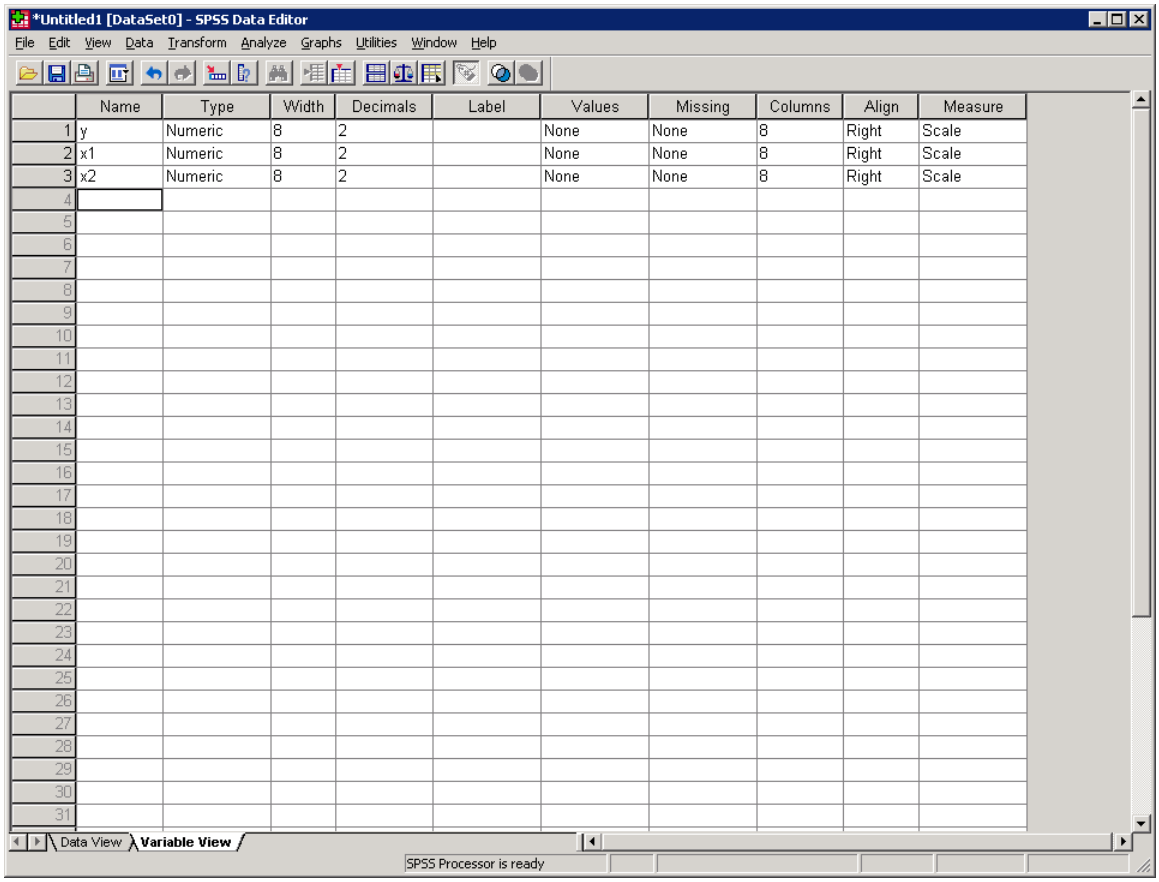
6. You will bring up the dialog box shown below. Name the file and save it in your WUAD drive (N: drive).
7. Click on **Save**.



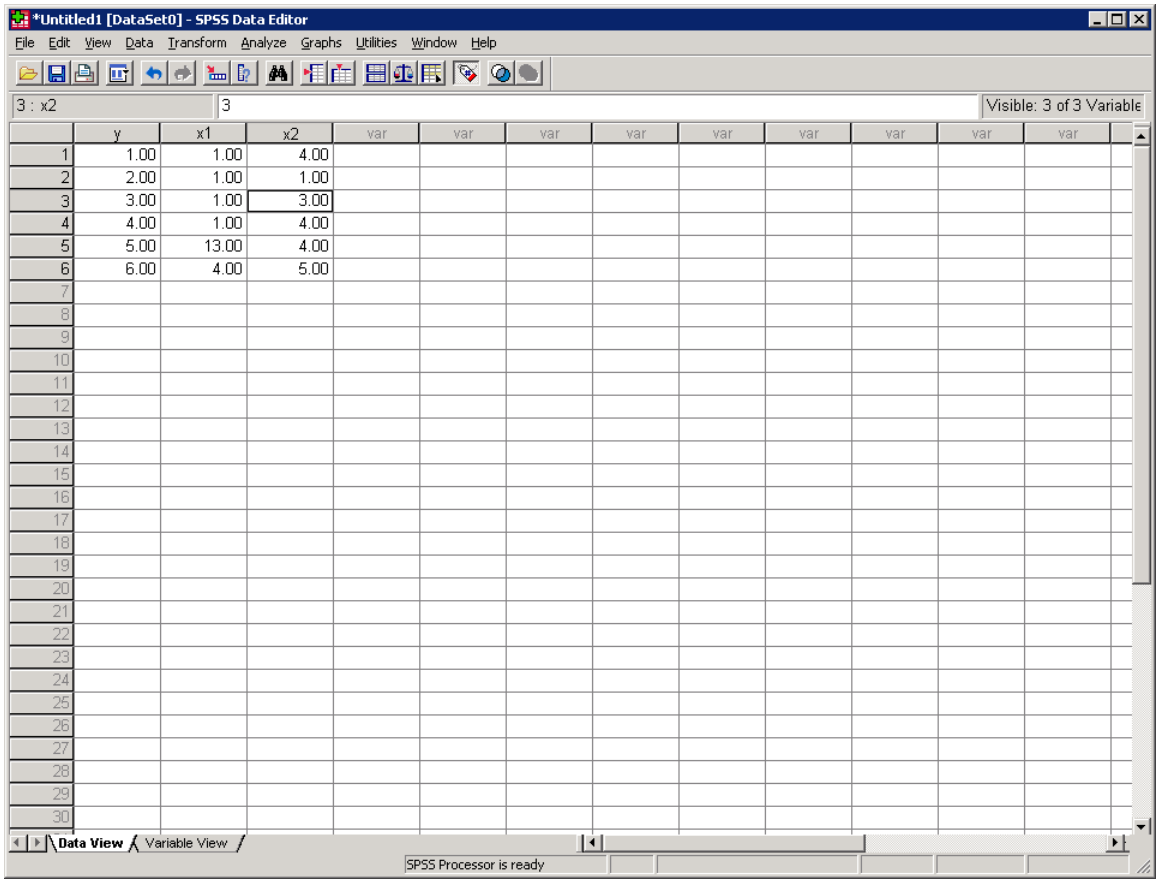
8. You will now be back to the dialog box from step 3. Click **OK**.

Typing data directly in SPSS

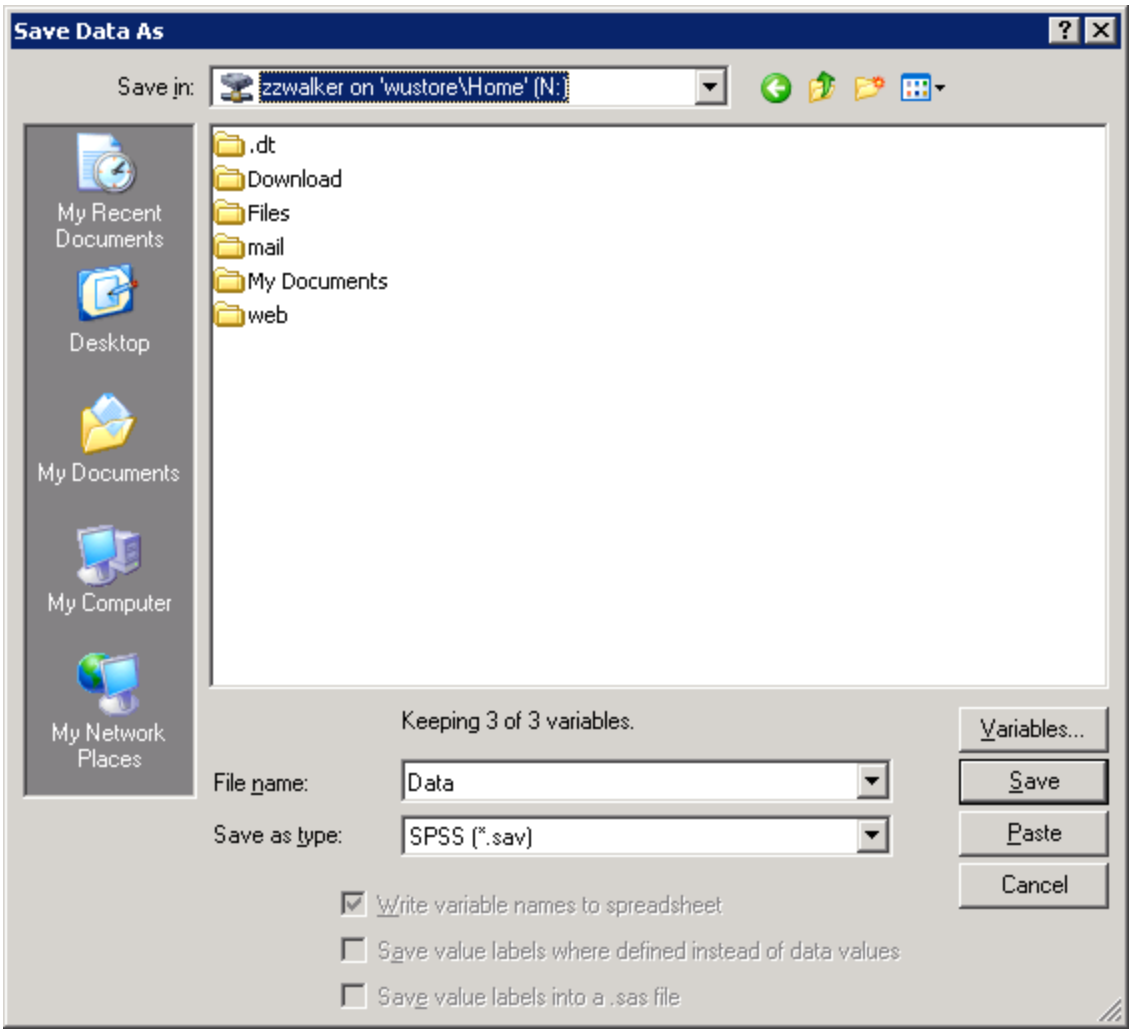
1. In SPSS select, **File>New>Data**
2. Click on the **Variable View** tab (at the bottom of the screen).
3. Type in the variable names in the *Name* column, the type of data (numeric, date, string, …) in the *Type* column. As shown below.



4. Once you have labeled your variables, click on the **Data View** tab.
5. Type in your data for each variable. An example is shown below.



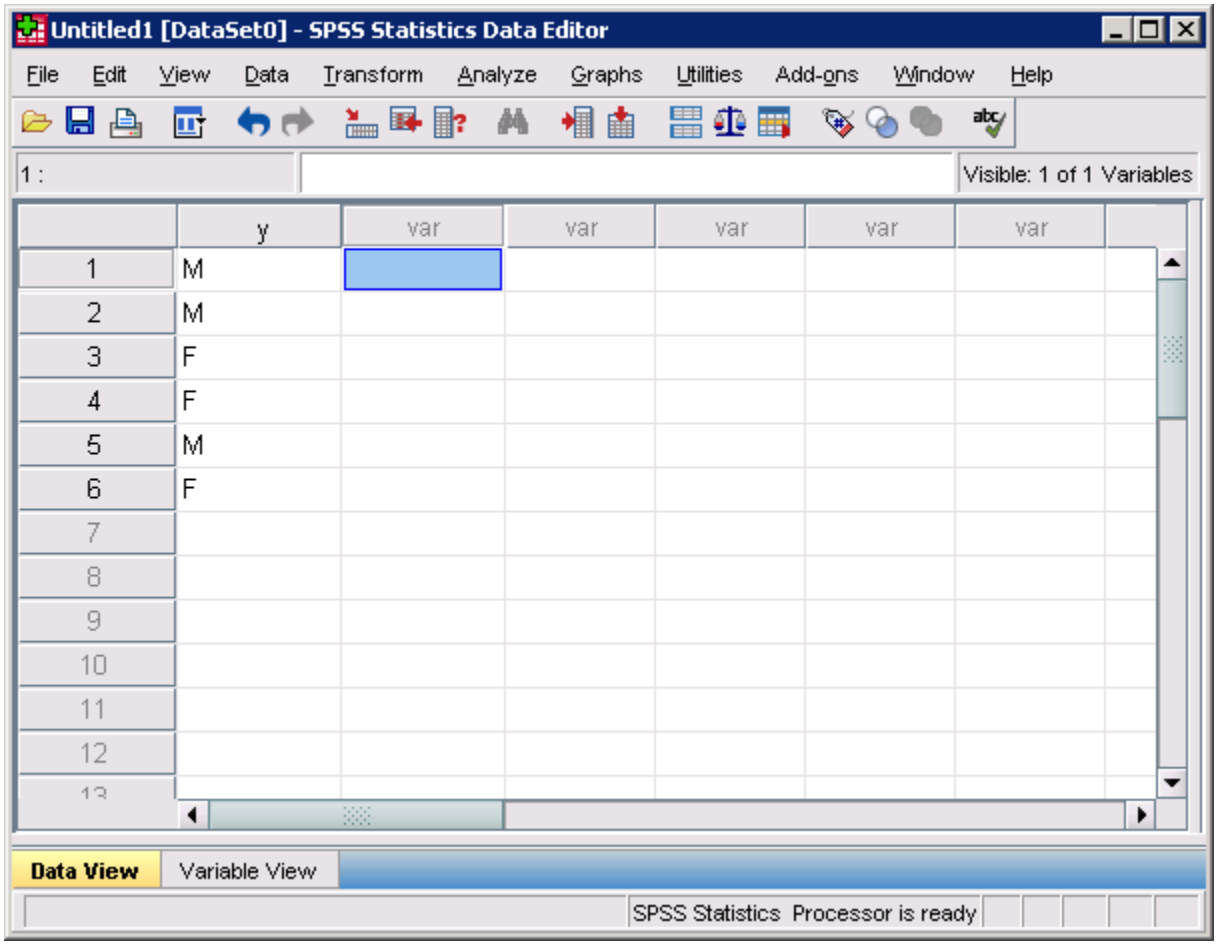
6. Save your file by selecting: **File>Save.**
7. Give your file a name that you will remember and save it to your WUADD account (N: drive).
8. Make sure that the file you are attempting to save is saved on WUAD (N: drive).


Save Data As
Save in:
zzwalker on 'wustore\Home' (N:)
My Recent Documents
Desktop
My Documents
My Computer
My Network Places
.dt
Download
Files
mail
My Documents
web
Keeping 3 of 3 variables.
Variables...
File name:
Data
Save
Save as type:
SPSS (*.sav)
Paste
Cancel
Write variable names to spreadsheet
Save value labels where defined instead of data values
Save value labels into a .sas file

Creating Dummy Variables from Categorical Data

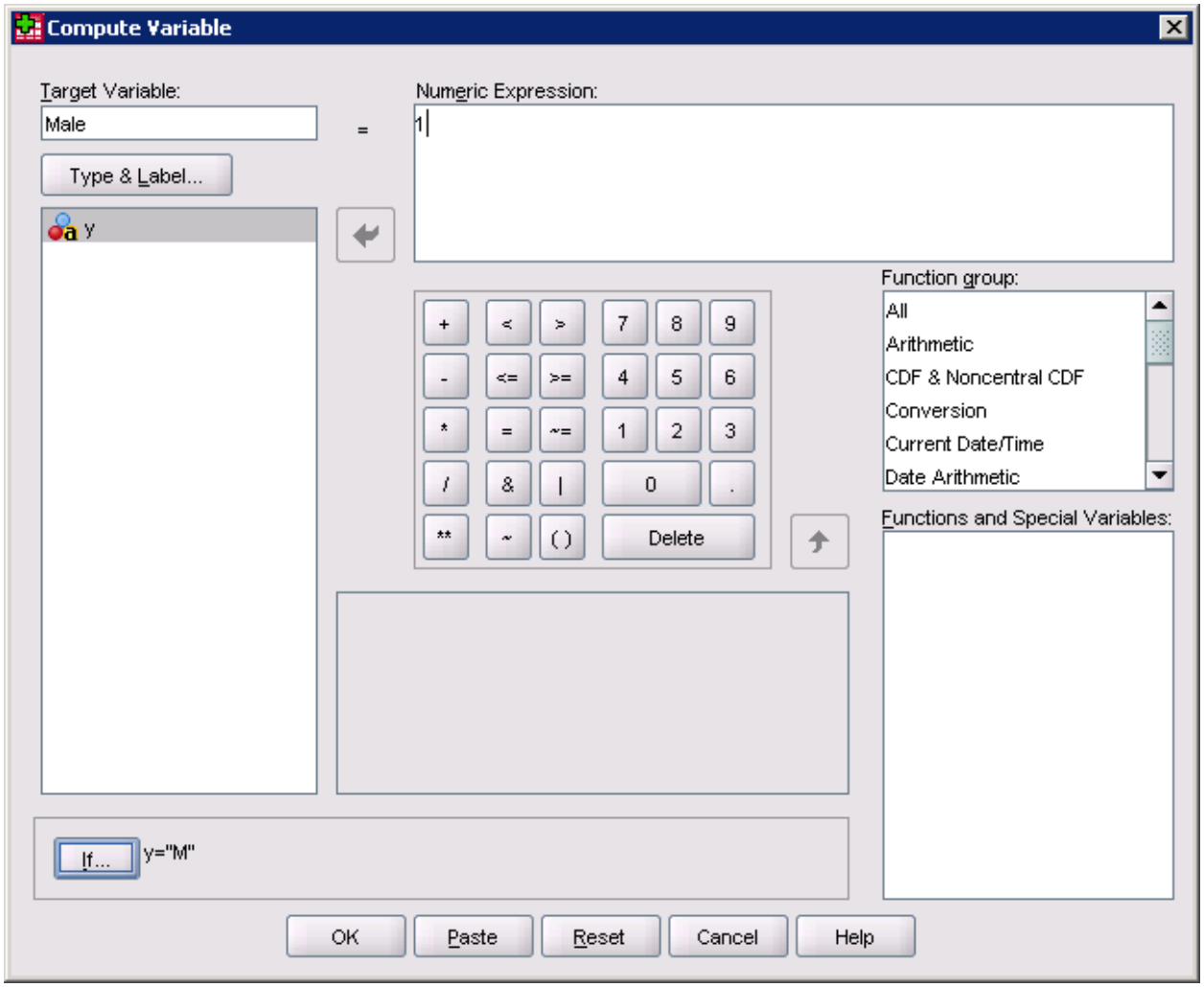
These directions will help with creating data that can be used in regression analysis from categorical data.

Suppose for example, gender is one of your variables and the data was keyed in as “M” or “F”. As the dataset below shows.

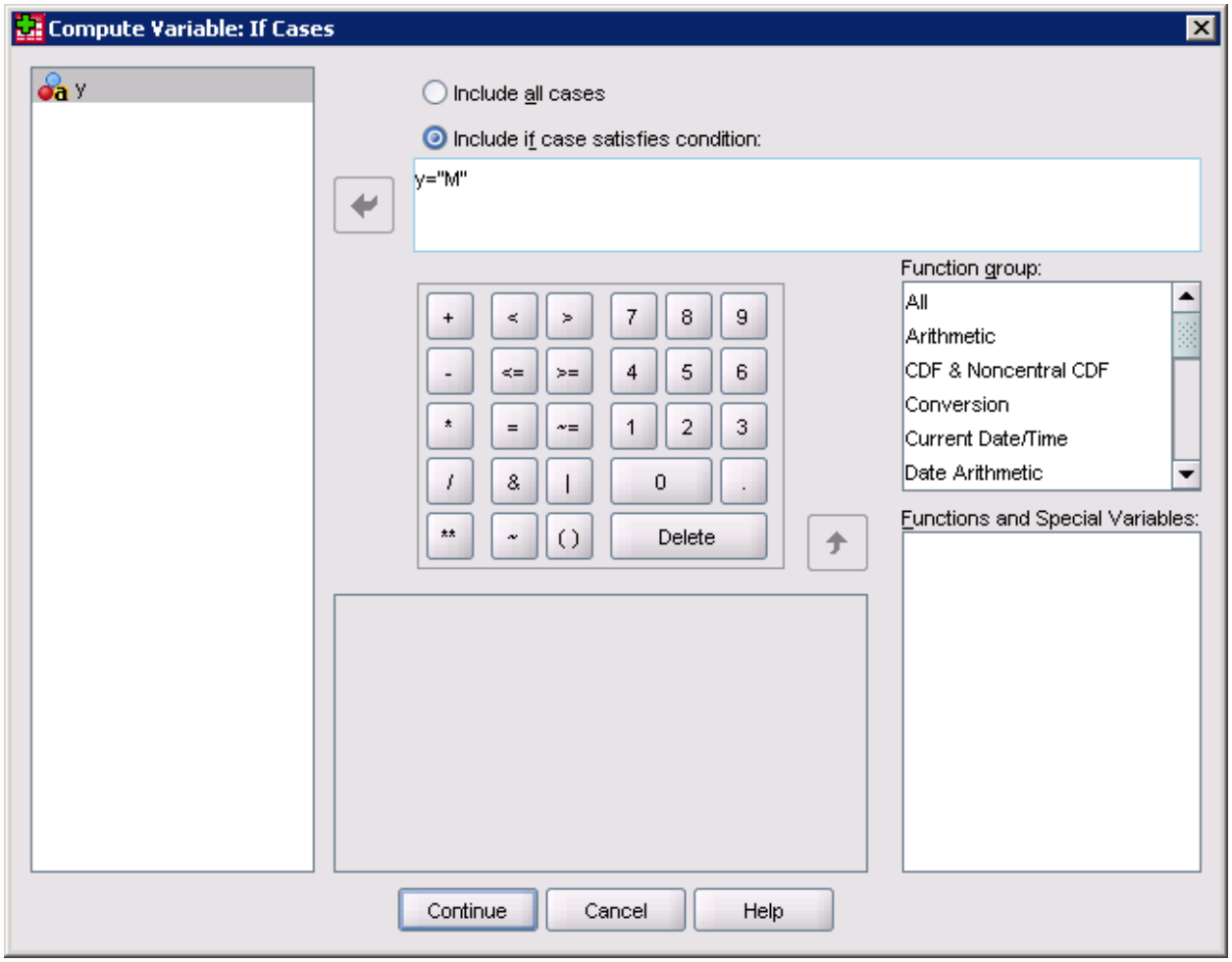


The first step is to create a new variable. To do this, **Transform > Compute Variable.** The “Target Variable:” box type in a name for the new variable (for example: Male).

In the “numeric expression:” box type in “1”.



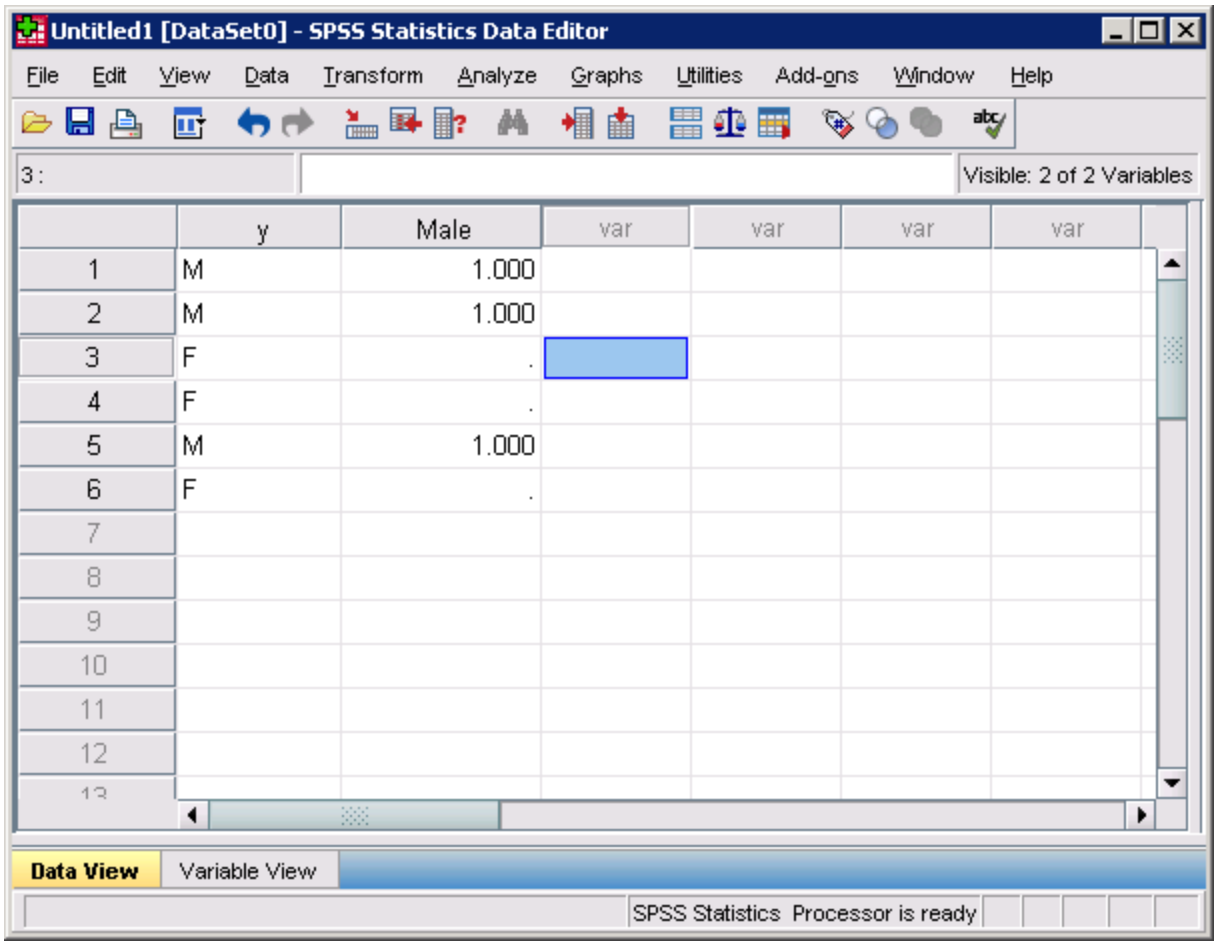
Click on the "If…" button. A new menu will pop up. The new menu will look like the one presented below.



You will need to put the formula for male into the box. Y = “M” is the formula given where “Y” is the original variable name for the qualitative data (“M” or “F”).

Click on the **Continue** button. Click **OK**.

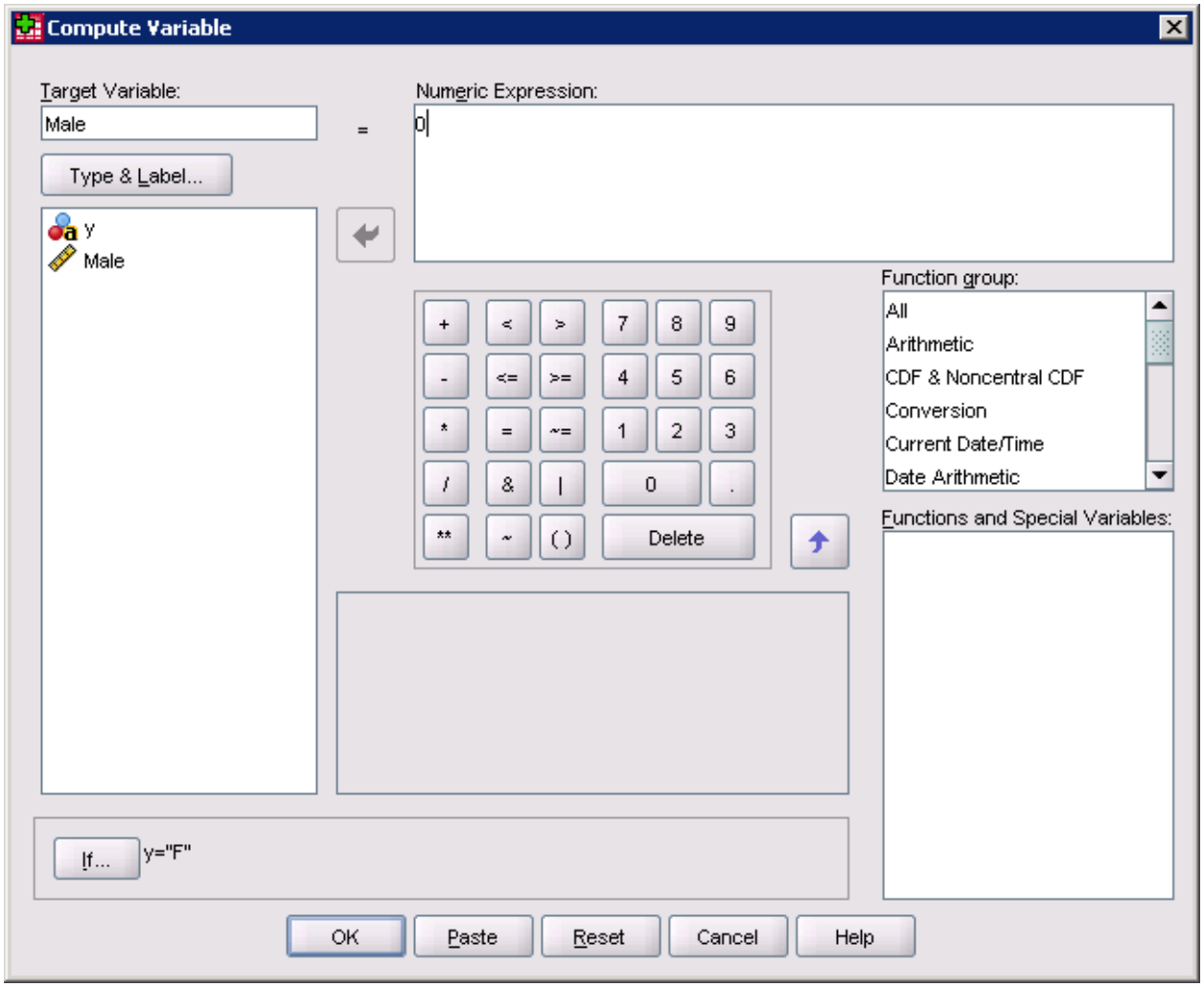
Your dataset should now look like the one below.



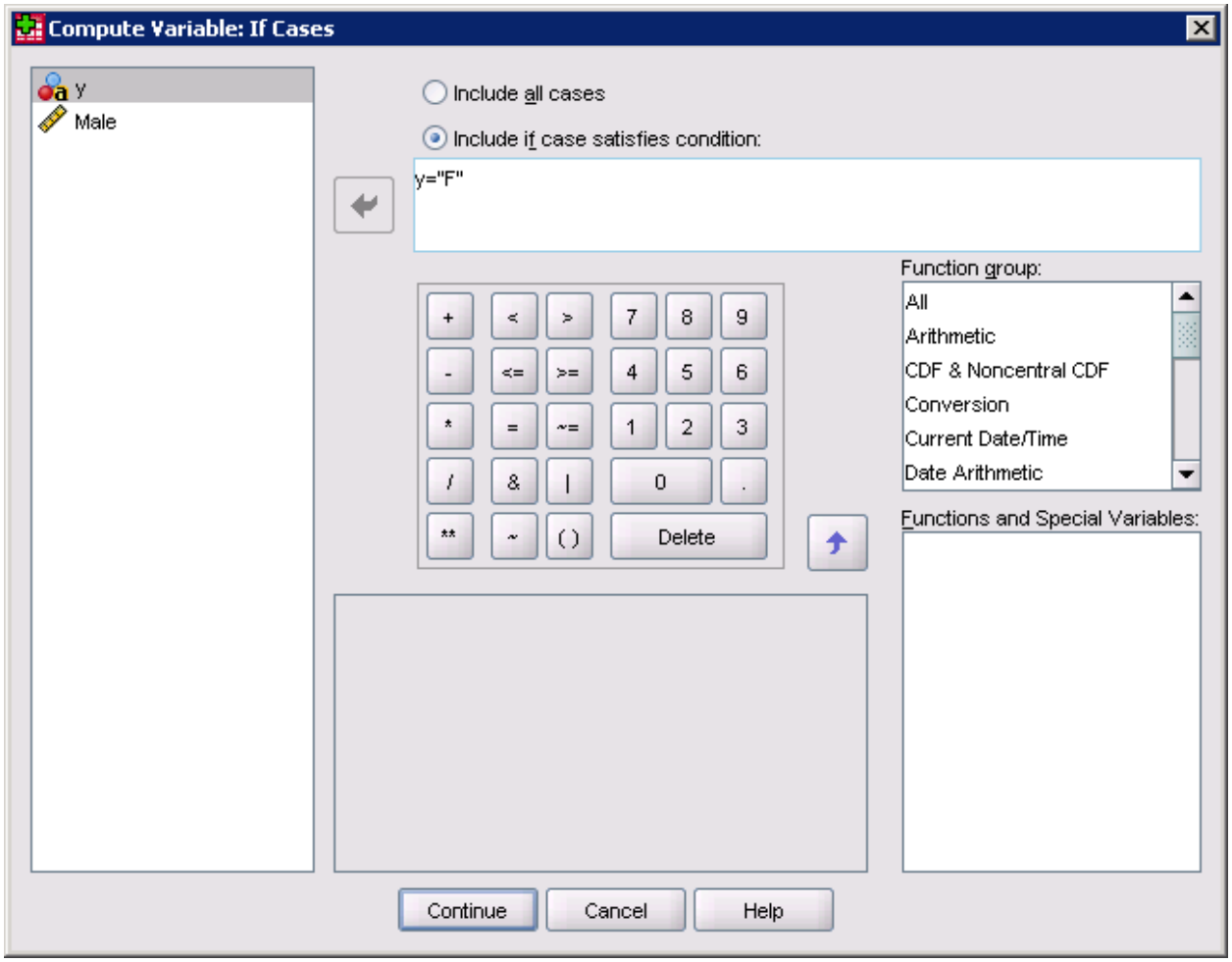
Now you will need to repeat the process for females.

To do this, **Transform > Compute Variable.** The "Target Variable:" box type in the variable name that you used previously (for example: Male). If you are doing this immediately after the first part of this procedure, then the variable name will already be typed in.

Change the "Numeric Expression" from 1 to 0. (see below)

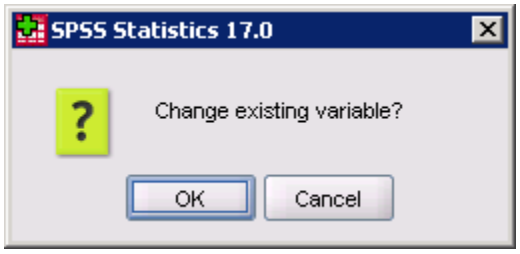


You should now have the dialog box below on your screen.



Click on the "If…" button. Change the equation to y = "F" and click on the **Continue** button. Then click **OK**.

When the dialog box pops up that asks "Change existing variable?" click **OK**.

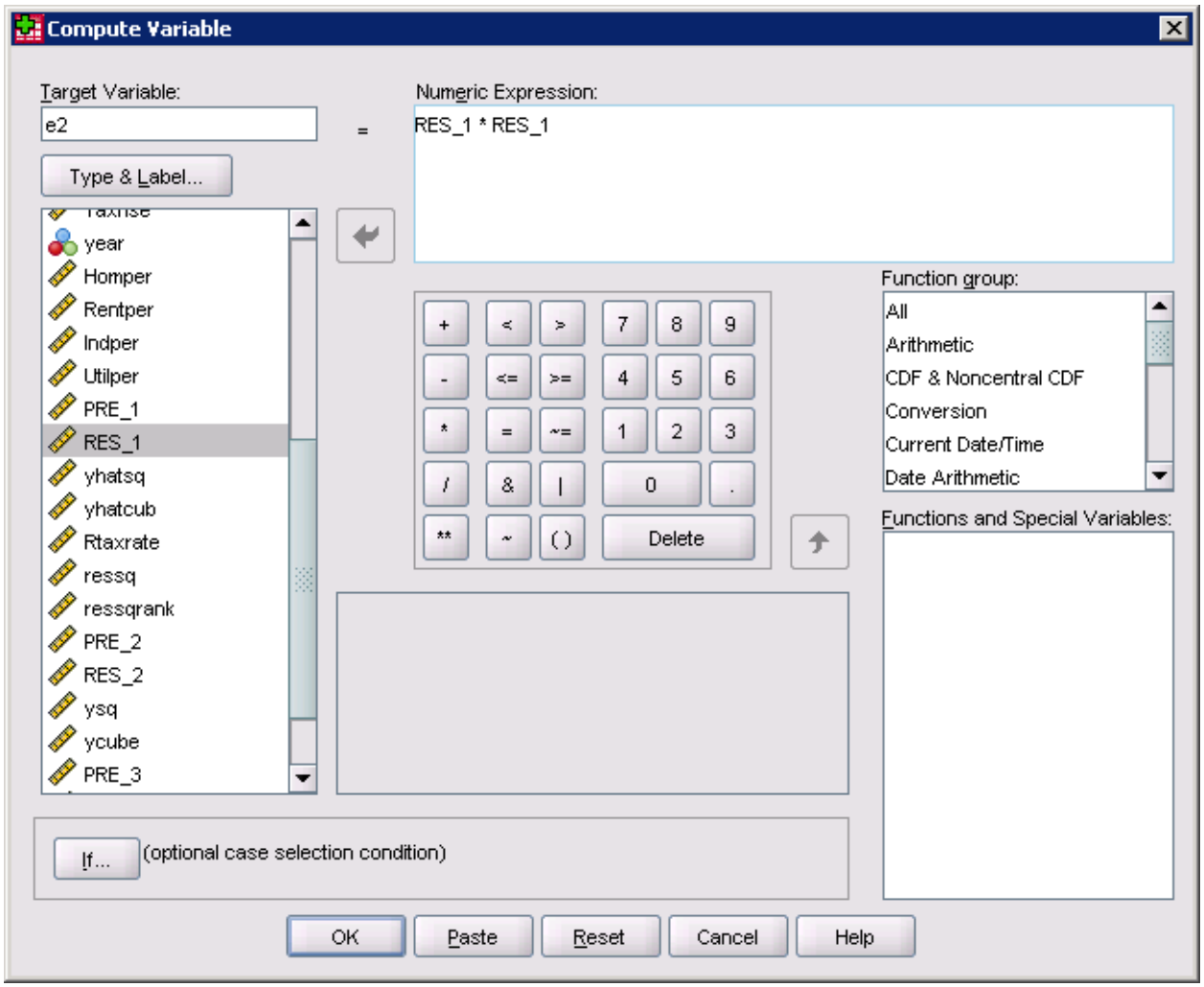


You should now have an indicator (dummy) variable which can be used in regression analysis.

Creating New Variables that are Functions of Other Variables

You can create new variables that are a function of any other variables in your dataset.

To do this, you need to **Transform > Compute Variable**.

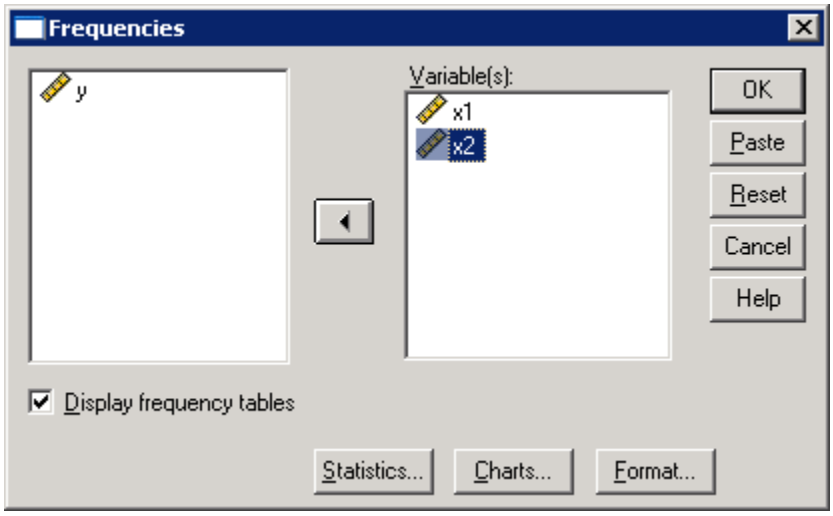


The "target variable" should be what you wish to name the variable that you are creating.

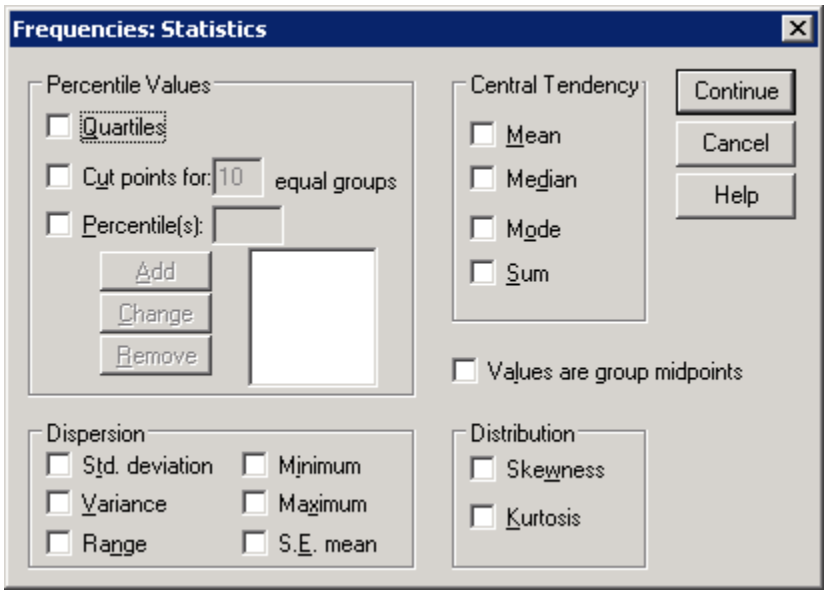
The "numeric expression" is the formula that you use to create the variable. In the example above a variable called e2 was created where e2 = RES_1 * RES_1 (or the residual squared).

Generating Descriptive Statistics of Data

1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Descriptive Statistics> Frequency.**
3. Move the (qualitative or quantitative) variables that you wish to calculate the frequency statistics of into the **Variable(s):** box. (In this example X1 and X2 will have frequency statistics calculated).

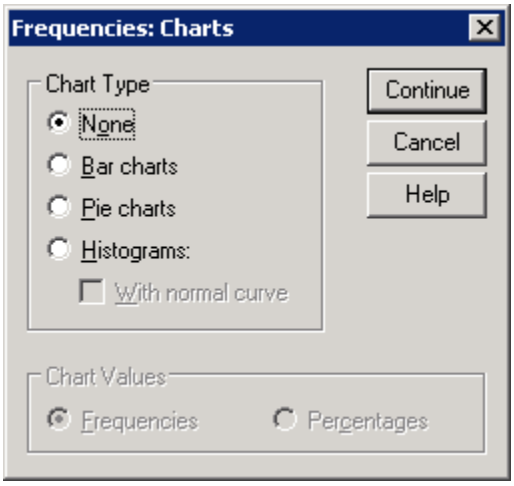


4. Select the **Statistics** button.
5. Check the boxes for each of the statistics that you wish to calculate.
6. Select the **Continue** button.



7. If you wish to plot the data in chart form, select the **Charts** button (See top illustration).

8. Hit the radial button for the chart that you wish to produce.
9. Select the **Continue** button.

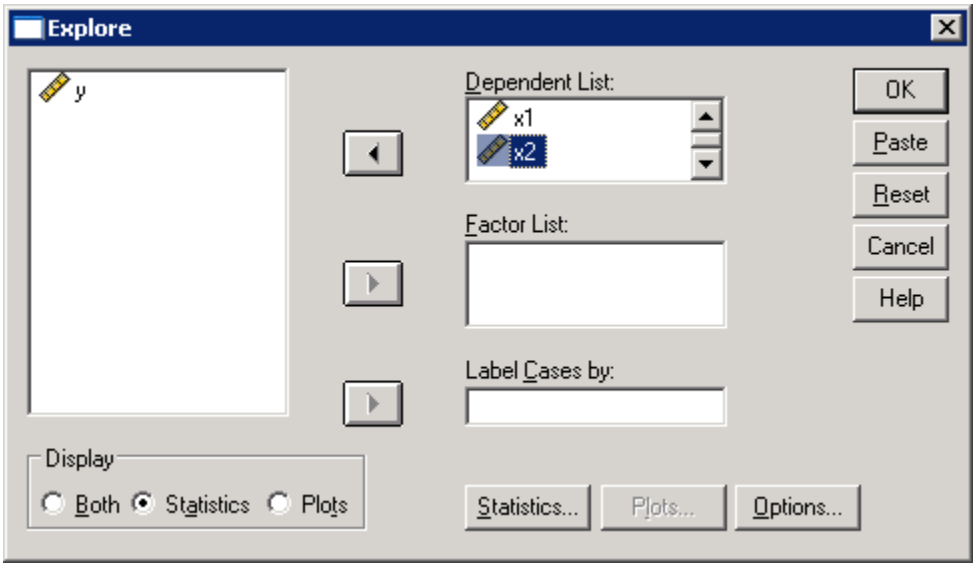


10. You should be back at the original Frequencies window.
11. Select the **OK** button.

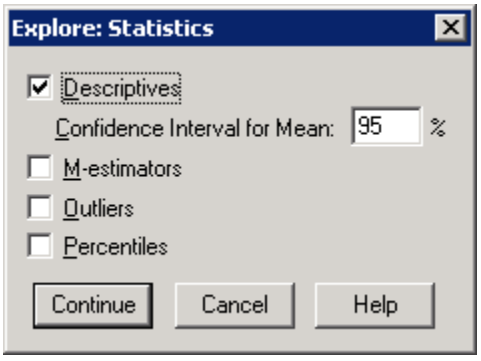
Generating Confidence Intervals

This page will describe how to create confidence intervals for the mean of a variable. This will not create confidence intervals for slope coefficients in a regression.

1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Descriptive Statistics> Explore**
3. Move the variables that you wish to calculate the confidence interval for into the **Dependent List:** box. (In this example X1 and X2 will have confidence intervals calculated).
4. In the display box, select the **Statistics** radial button.



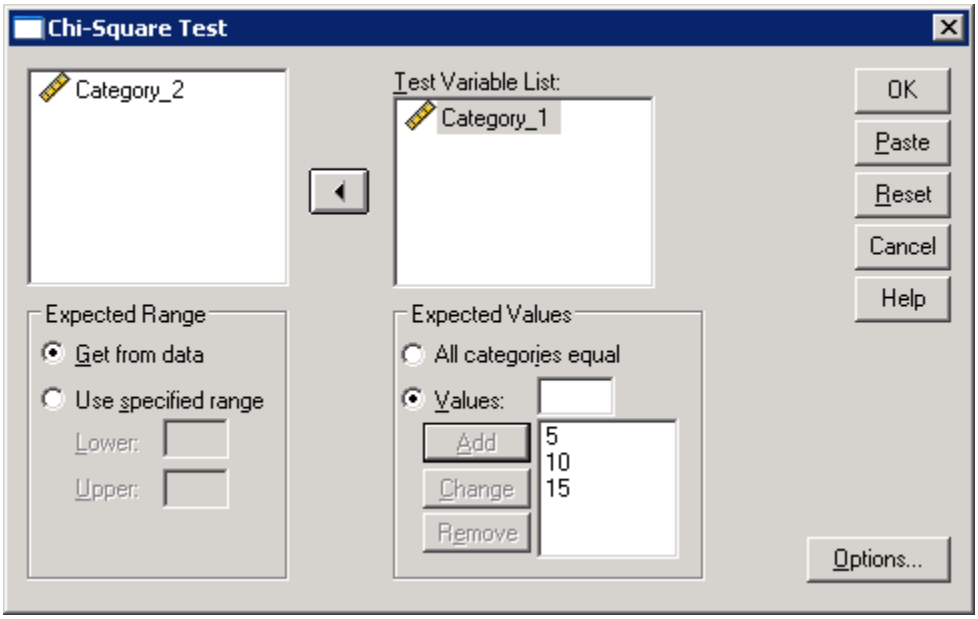
5. Select the **Statistics** button.
6. Type in the significance level for the confidence interval you wish to create. The default is a 95% confidence interval. This will create a 95% confidence interval for the mean of the variables in the dependent list.
7. Select the **Continue** button.



8. You should be back at the original Explore window.
9. Select the **OK** button.

One-Way Contingency Table

1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Nonparametric Tests> Chi-Squared**.
3. Move the Categorical variable(s) into **Test Variable List** box.

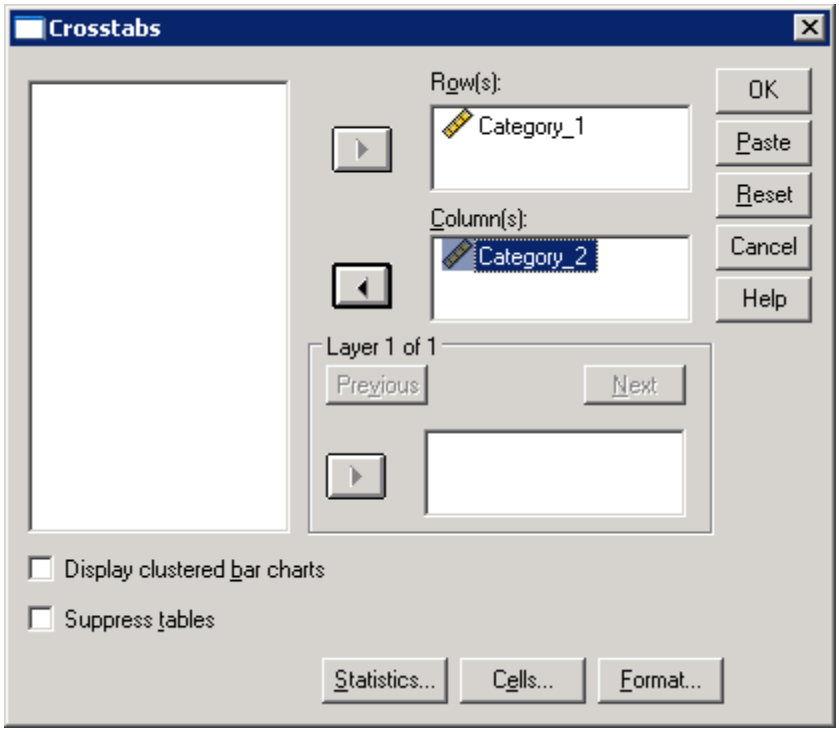


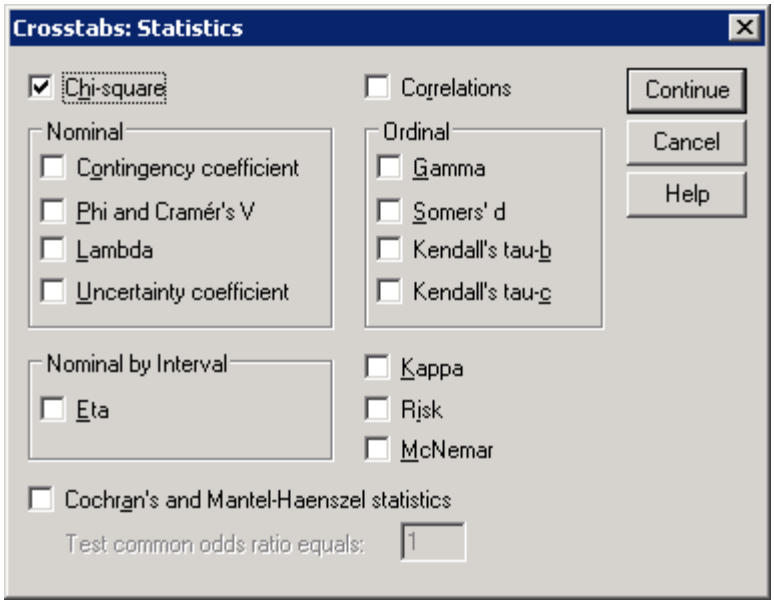
4. In the **Expected Values** box select one of the radial buttons.
    a. If all of the categories have the same expected probability select: **All categories equal**.
    b. If the categories have different expected probabilities select: **Values** and **Add** the probabilities for the categories. The order of the values is important; it corresponds to the ascending order of the category values of the test variable. The first value of the list corresponds to the lowest group value of the test variable, and the last value corresponds to the highest value.
5. Click on the **OK** button.

Two-Way Contingency Table

1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Regression> Linear Regression**.
3. Move the dependent variables into **Dependent:** box.
4. Move the independent variables into **Independent(s):** box.

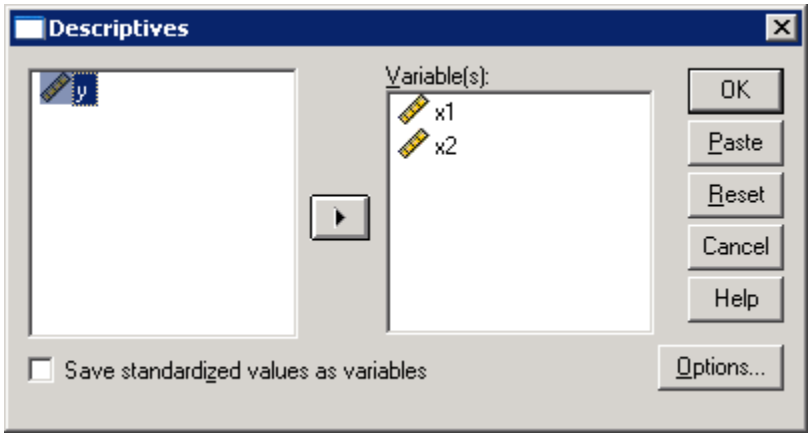
Analyze*Descriptive Statistics*Crosstabs



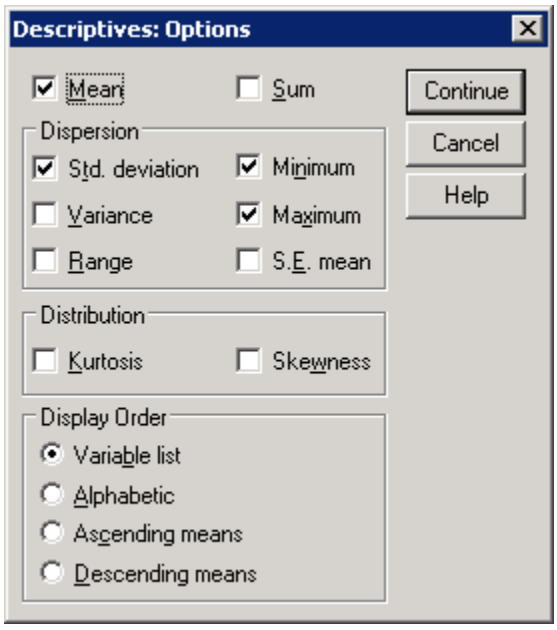


Generating Descriptive Statistics of Numerical Data

1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Descriptive Statistics> Descriptives**
3. Move the variables that you wish to calculate the descriptive statistics of into the **Variable(s):** box. (In this example X1 and X2 will have descriptive statistics calculated).



4. Select the **Options** button.
5. Check the boxes for each of the statistics that you wish to have generated in SPSS. (In this case the sample mean, standard deviation, minimum, and maximum will be calculated).
6. Select the **Continue** button.

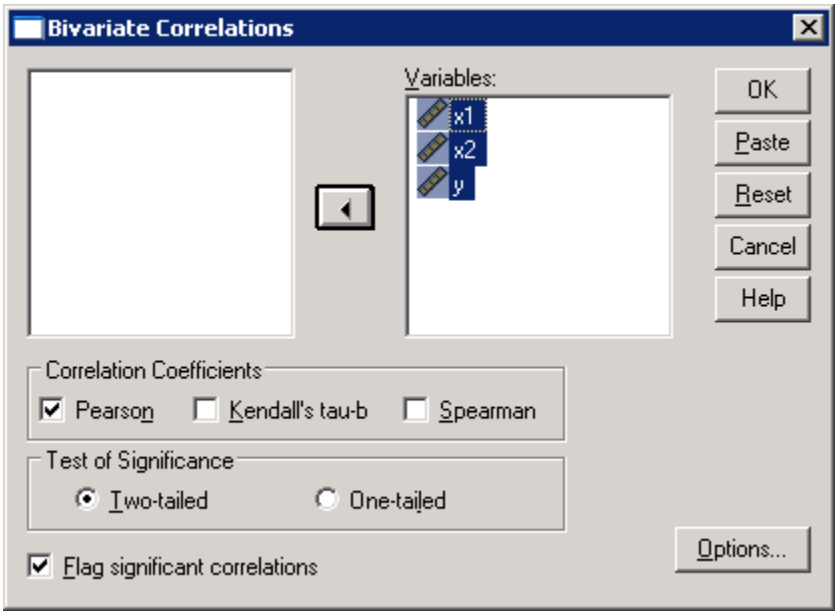


7. You will be back at the previous screen. Select **OK** to create the descriptive statistics.

Generating Correlation Matrix

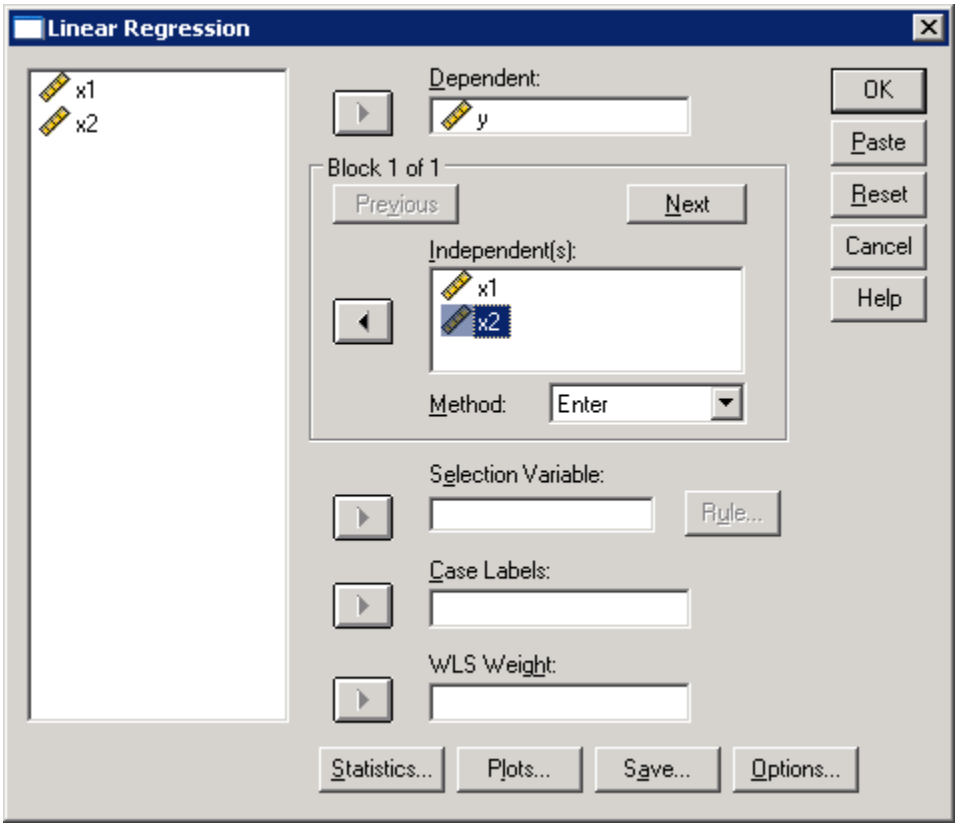
This will present the Pearson's correlations (assumption of normality) for your dependent and/or independent variables. You will need to create the correlation matrix of ALL independent variables to test for multicollinearity.

1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Correlate> Bivariate**
3. Move the variables that you wish to calculate the confidence interval for into the **Variables:** box. (In this example Y, X1 and X2 will be in the correlation matrix).
4. In the **Correlation Coefficients** box, make sure that Pearson is checked (Unless you wish to do a different correlation calculation. Pearson is the most popular and Spearman is the second most popular).
5. Select the two-tailed or one-tailed (whichever is appropriate) radial button.
6. Select **OK**.

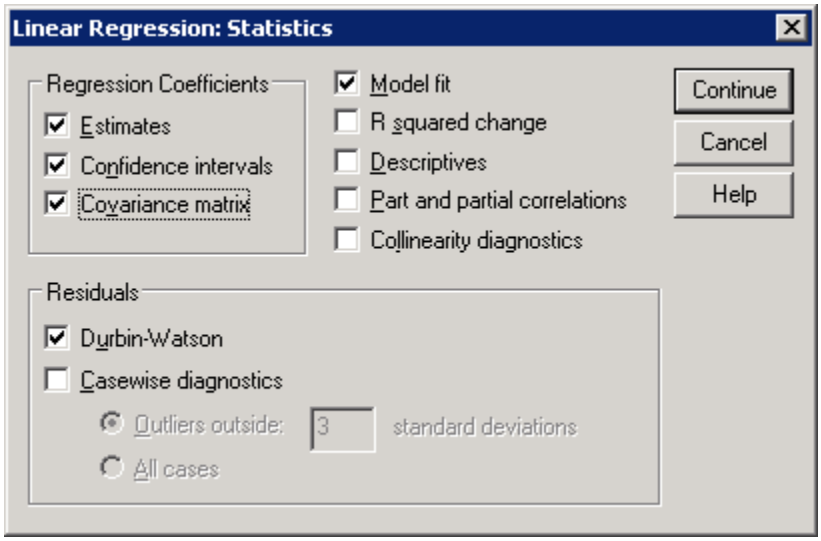


Linear Regression

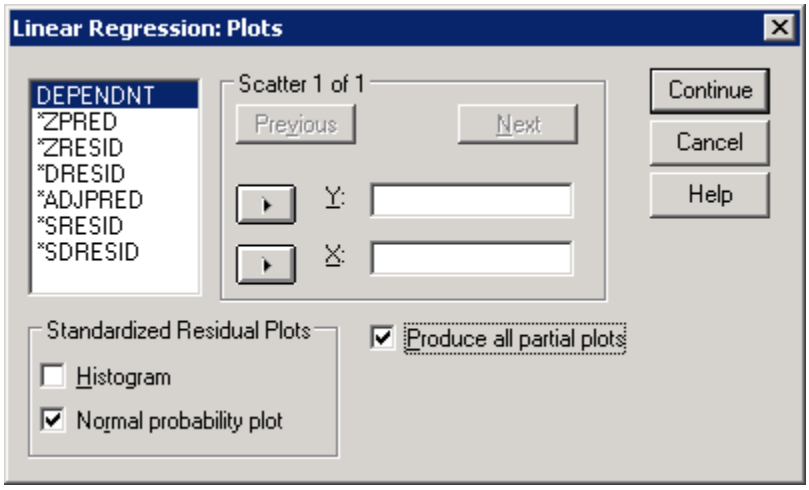
1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Regression> Linear Regression**.
3. Move the dependent variables into **Dependent:** box.
4. Move the independent variables into **Independent(s):** box.



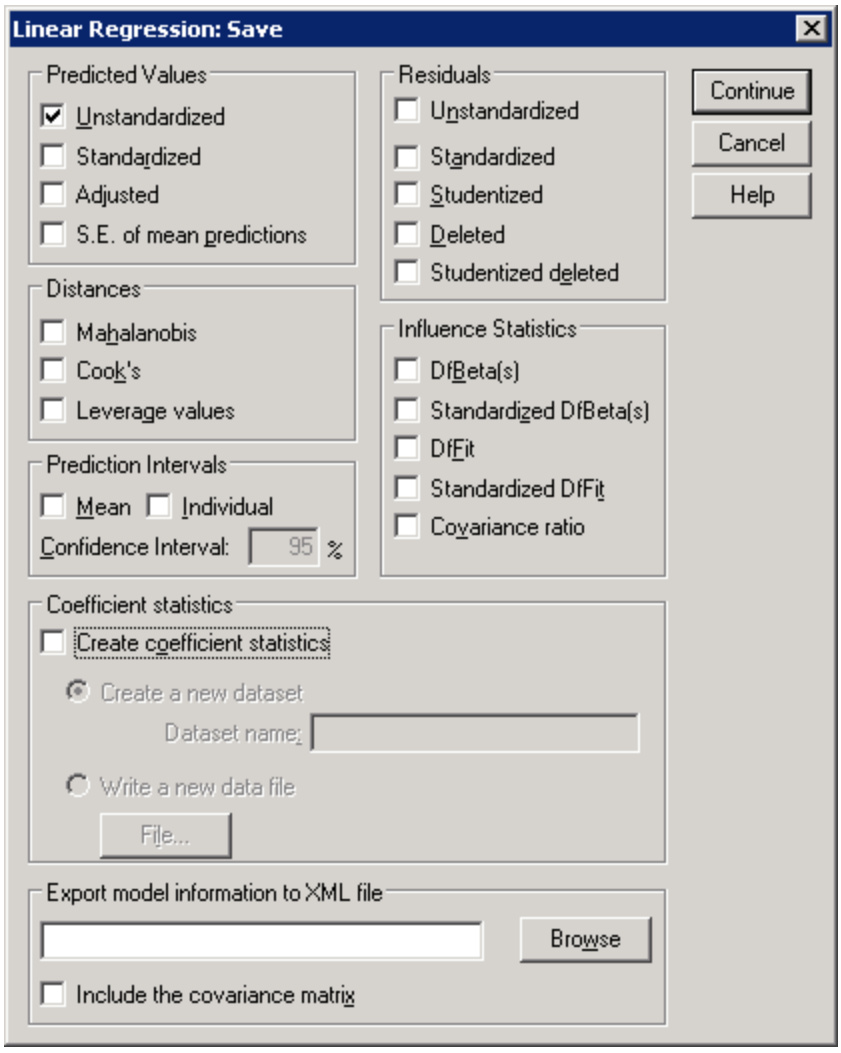
5. Select the **Statistics** button.
6. Check all the boxes by the statistics that you wish SPSS to calculate. The **Covariance matrix** can be used to check for multicollinearity. The **Durbin-Watson** can be used to test for autocorrelation.
7. Select the **Continue** button.



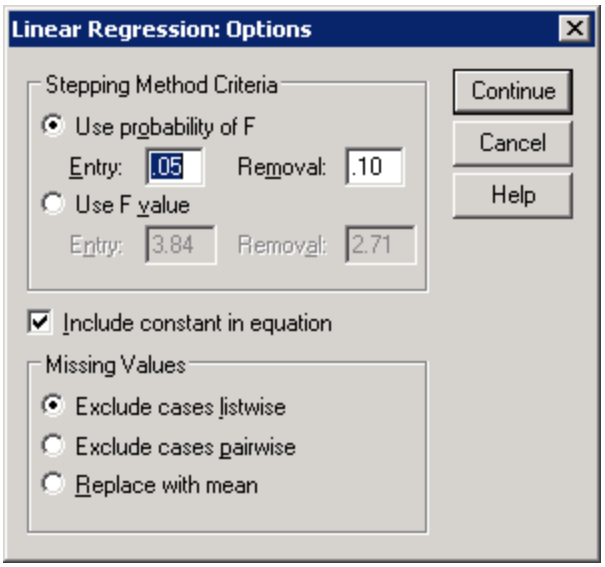
8. You will now be at the original Linear Regression window.
9. If you wish to use graphical analysis to test for normality or possible heteroskedicity, then select the **Plots** button; otherwise, continue on to step 12 (as shown in the illustration in step 4 above).
10. Check the **Normal Probability Plot** to test for normality and/or the **Produce all partial plots** to test for heteroskedacitiy.
11. Click on the **Continue** button.



12. You will now be at the original Linear Regression window (Shown in step 4).
13. If you wish to save either the residuals or the predicted values of the dependent variable for other tests or corrections, then click on the **Save** button; otherwise, continue on to step 16.
14. Check **Unstandardized** in the "Predicted Values" box to get $\hat{y}$ and/or check **Unstandardized** in the "Residuals" box to get $y - \hat{y}$.
15. Click on the **Continue** button.



16. You will now be at the original Linear Regression window (Again shown in step 4).
17. If your data set has missing values or you wish to run the regression through the origin (no y-intercept), the click on the Options button; otherwise go to step 21.
18. If you are forcing the sample regression line through the origin, then get rid of the check mark in front of **Include constant in the equation**.
19. If you have omitted variables, then you need to decide how the program will handle the omitted variables. In the **Missing Variables** box: **Exclude cases listwise** will exclude the whole case if there is a missing observation in the case and **Replace with mean** will replace any missing observation with that variable's mean.
20. Click on the **Continue** button.



21. You will now be at the original Linear Regression window (See step 4).
22. Click on the **OK** button.

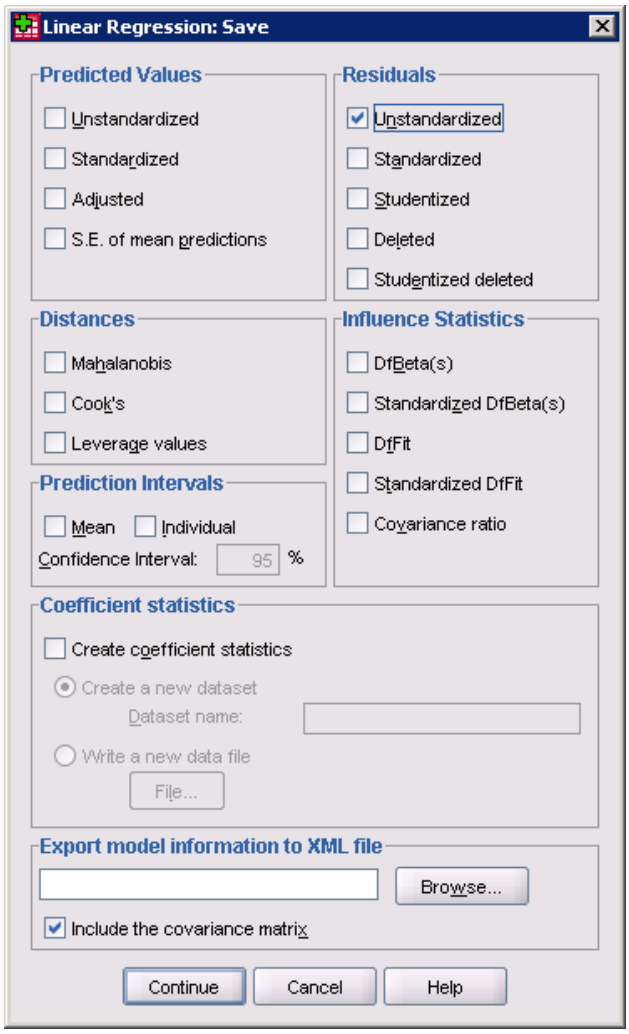
You will not need to check any boxes for this class that are not checked in the example above.

Szroeter's Test (Heteroskedasticity)

You need to get two things to do the test.

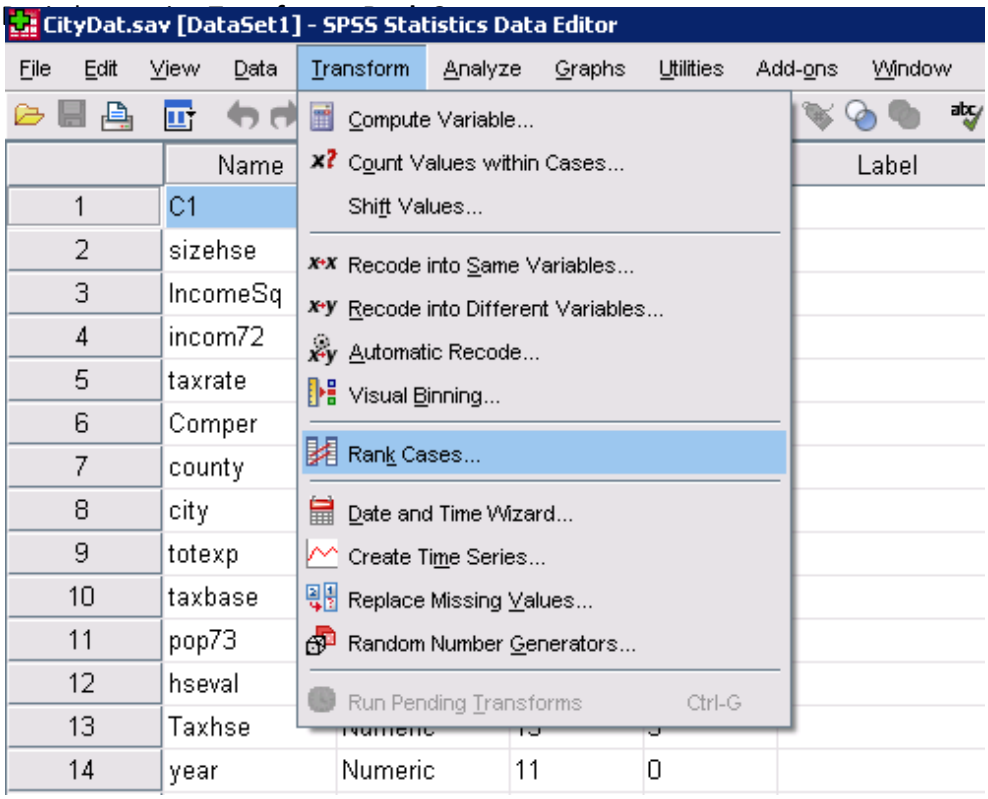
- The unstandardized residuals.
- The rank of the independent variable that you believe to be heteroskedastic

To compute the unstandardized residuals, you will need to run a regression. When you are in **Analyze > Linear Regression**, click on the **SAVE** button .

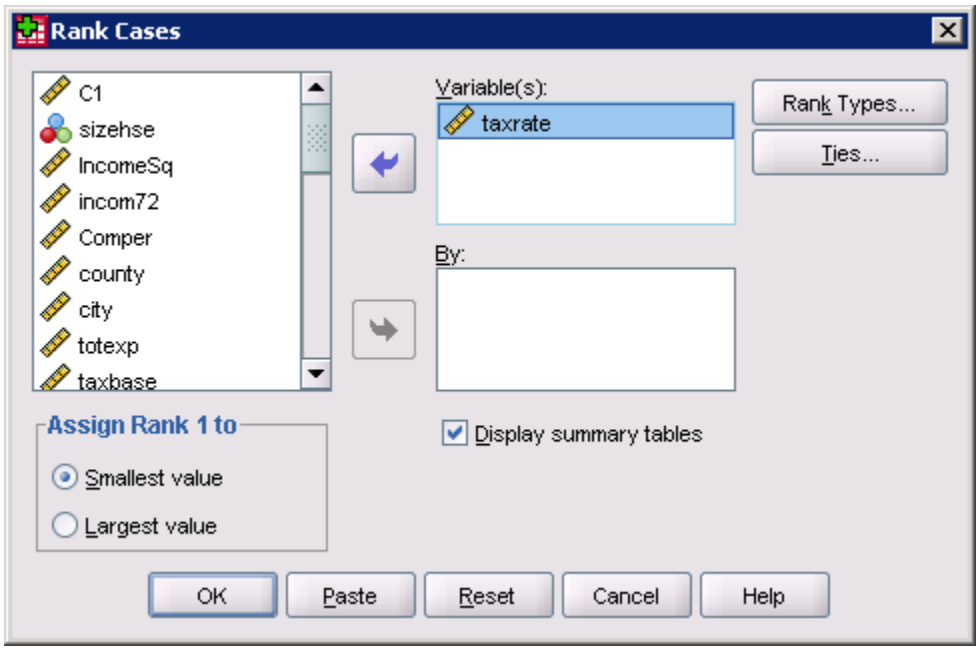


When the above dialog appears, check "Unstandardized" in the Residuals box.

To compute the rank of the independent variable that is believed to be heteroskedastic do the following:



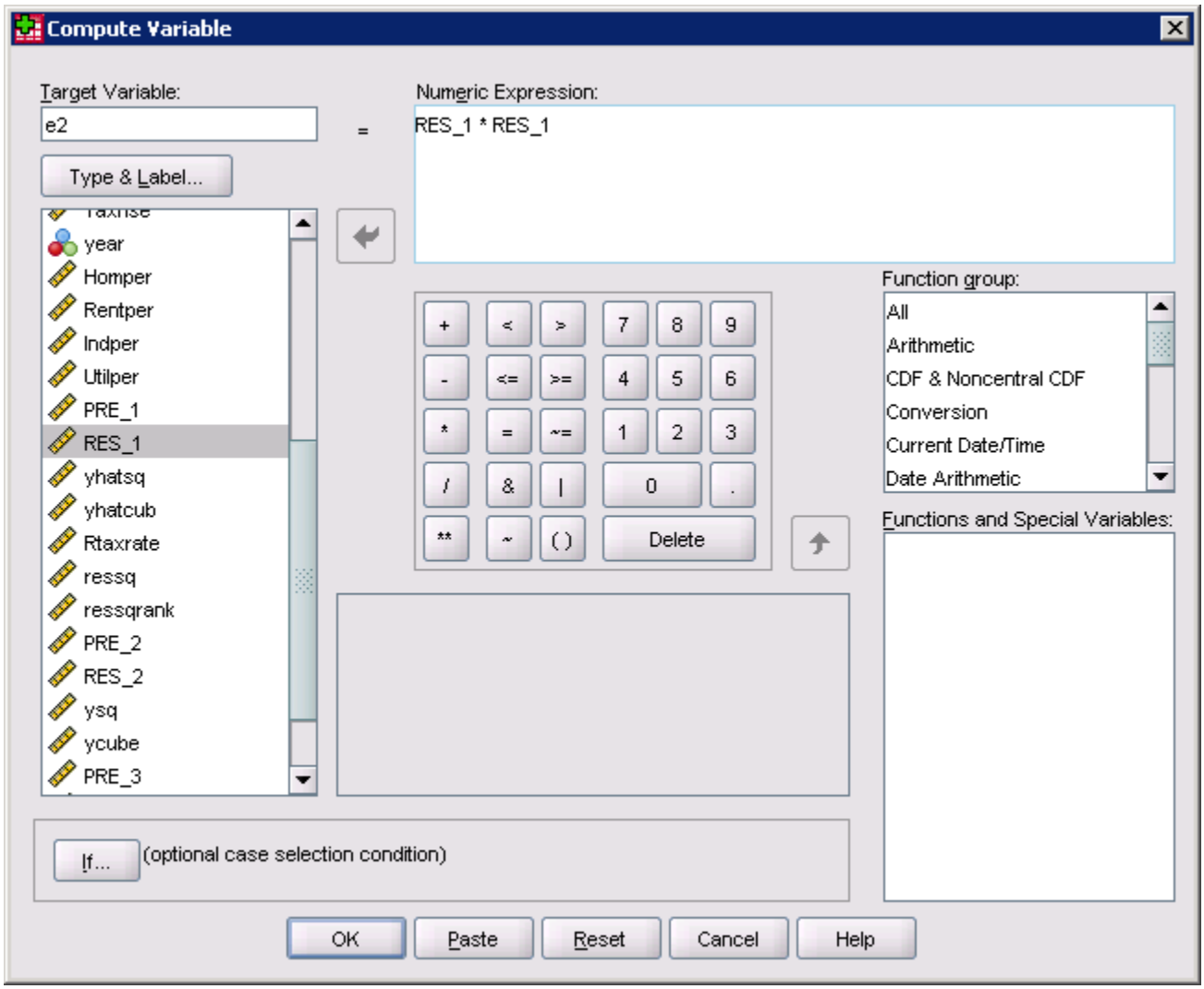
When the Rank Cases dialog appears, put one of your independent variables in the **Variable(s):** box as I did below with "taxrate".



Next you will need to create two variables:

1. Rank * Residual
2. Residual * Residual

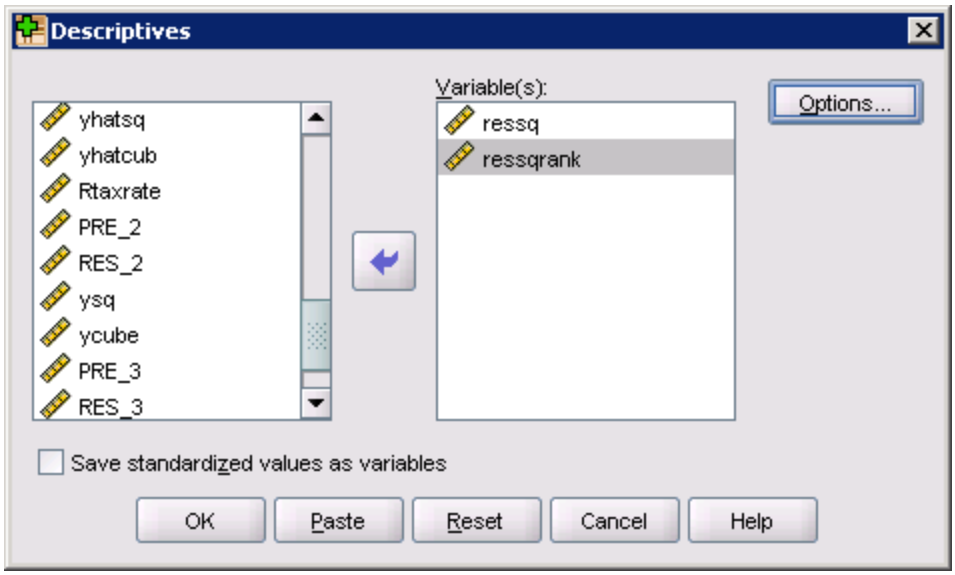
To do this, you need to **Transform > Compute Variable**.



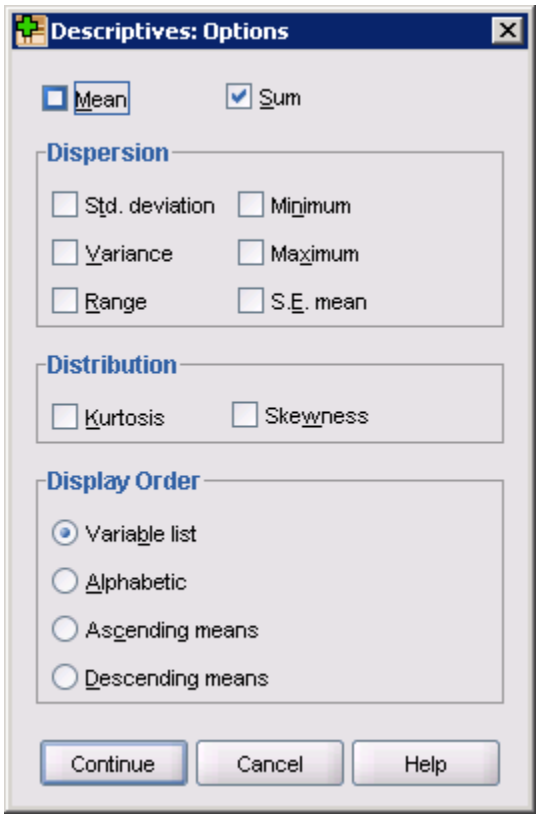
The "target variable" should be what you wish to name the variable that you are creating. The "numeric expression" is the formula that you use to create the variable. An example of the residual squared is given in the box above.

Finally you will need to calculate the sum of the two variables that you just created. To do this, run **Analyze > Descriptive Statistics > Descriptives**.

Put the two variables just created in your "**Variable(s):**" list as shown below and select the **OPTIONS** button.



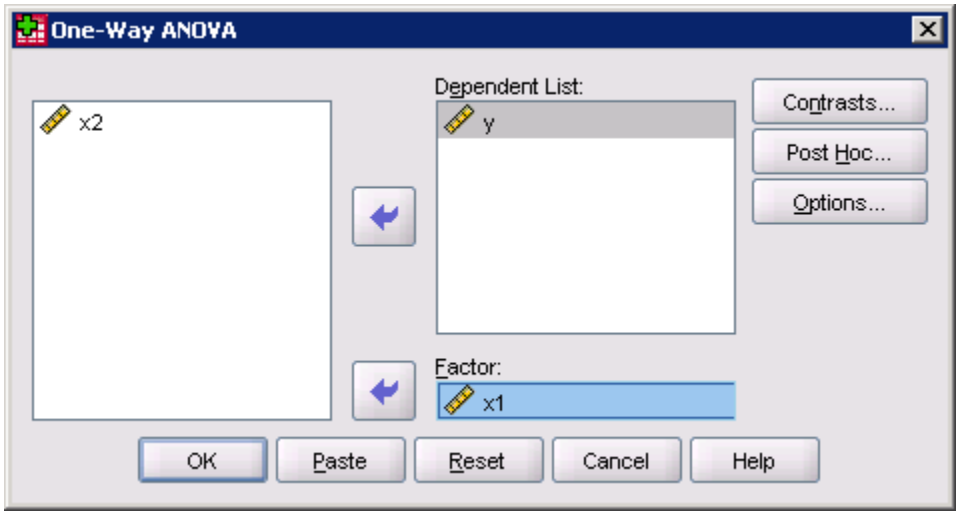
In the Options section you want to check the “Sum” box at the top.



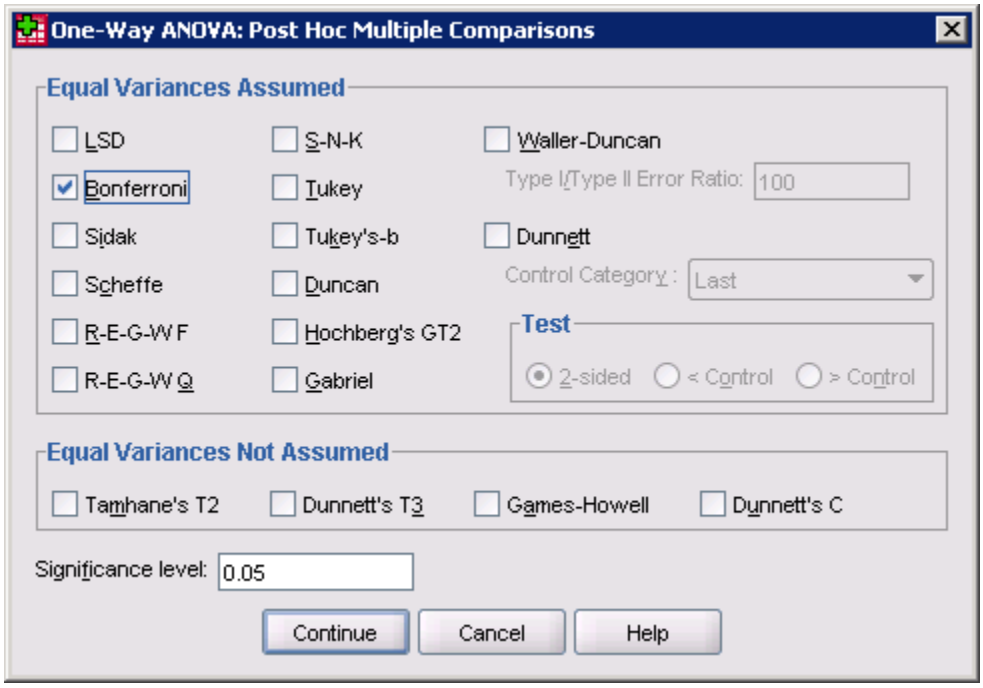
Analysis of Variance (ANOVA)

The ANOVA test will text for equality of means between two or more samples.

1. Open or create the data you wish to analyze (see appropriate directions). The "y" variable should have the observations that you need to test in it. The "x1" variable should be a key to which sample the data comes from.
2. In SPSS select, **Analyze> Compare Means > One-Way ANOVA**.

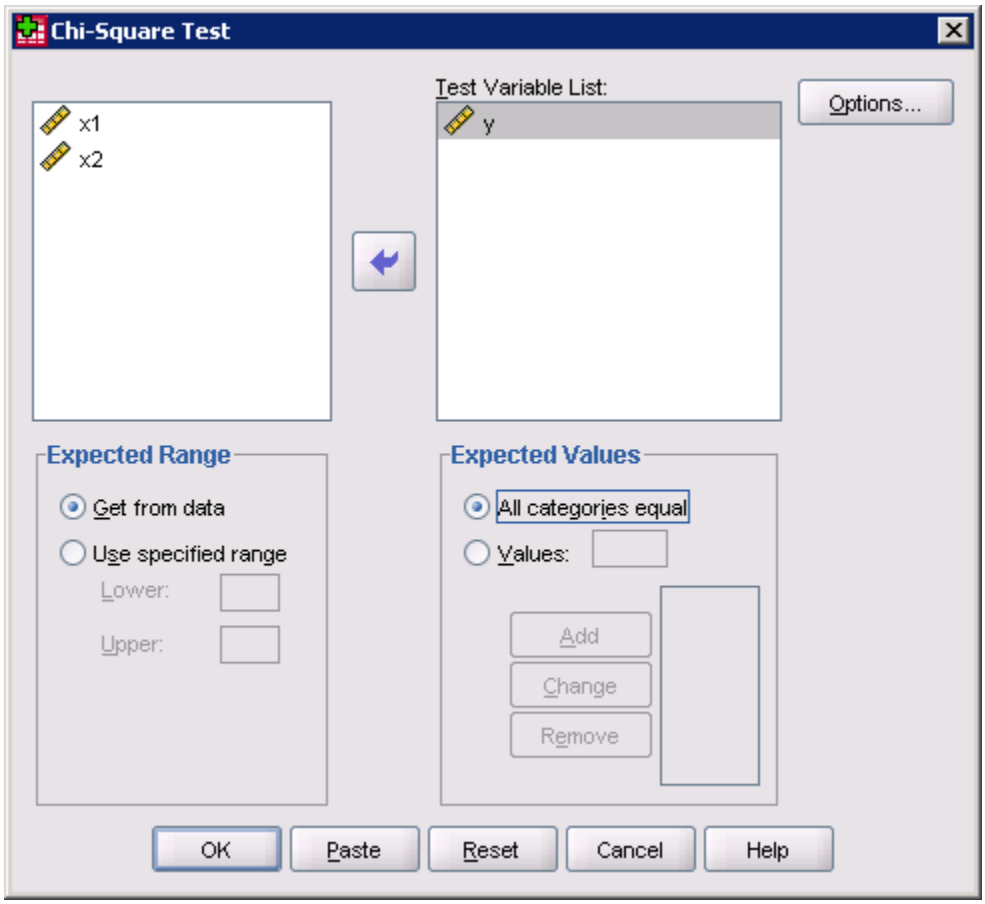


Based upon the test that we do in class, you will select the "Bonferroni" test.



Categorical Data Analysis (One-Way Chi-Squared Test)

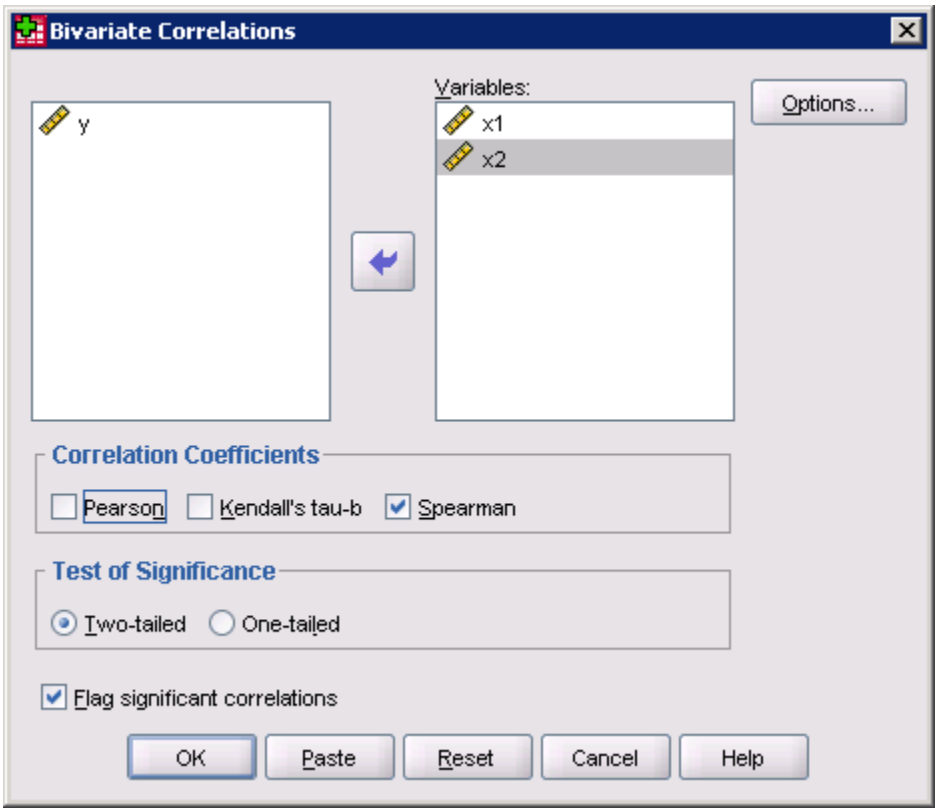
1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Nonparametric Tests > Chi-Square**.



Spearman's Rank

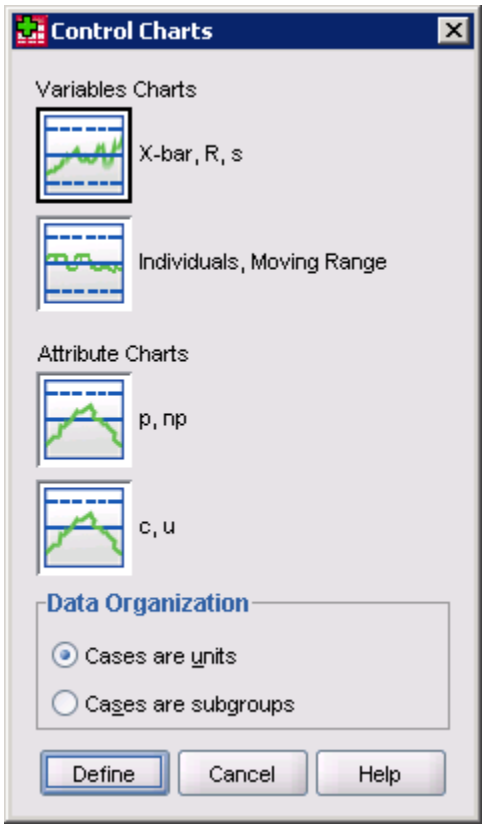
To test for correlations when there is NO underlying distribution, use Spearman's rank.

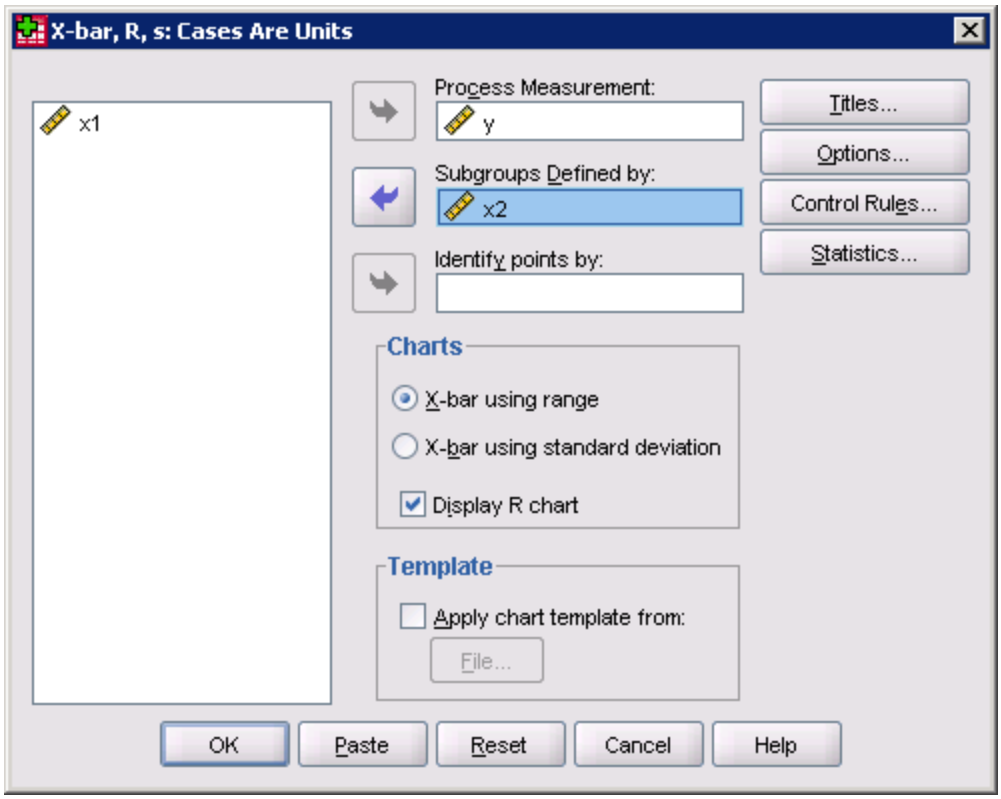
1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Correlate > Bivariate**.
7. Move the variables that you wish to calculate the confidence interval for into the **Variables:** box. (In this example X1 and X2 will be in the correlation matrix).
8. In the **Correlation Coefficients** box, make sure that Spearman is checked. Pearson assumes normality and Spearman is the non-parametric correlation.
9. Select the two-tailed or one-tailed (whichever is appropriate) radial button.
10. Select **OK**.

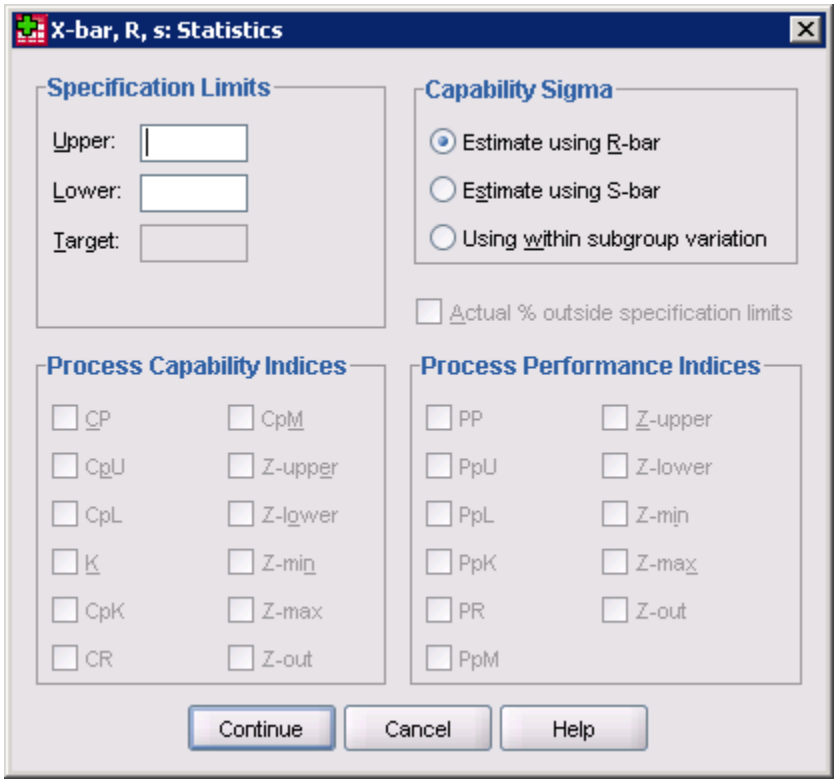


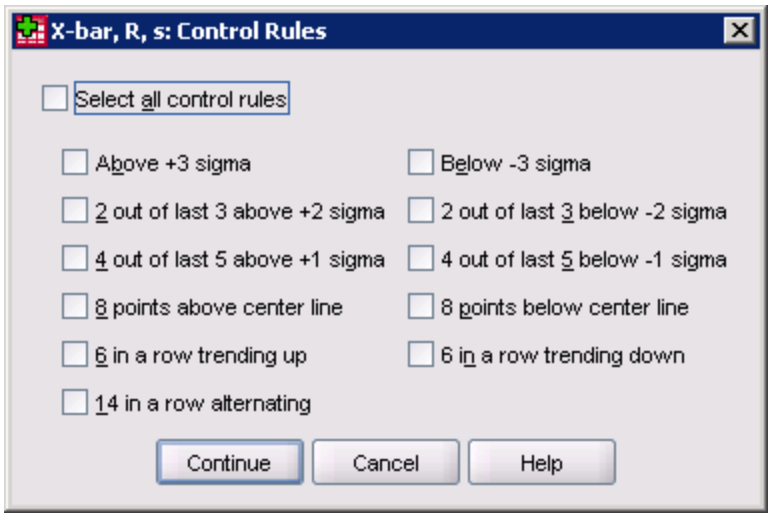
Control Charts

1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Analyze> Quality Control > Control Charts**.



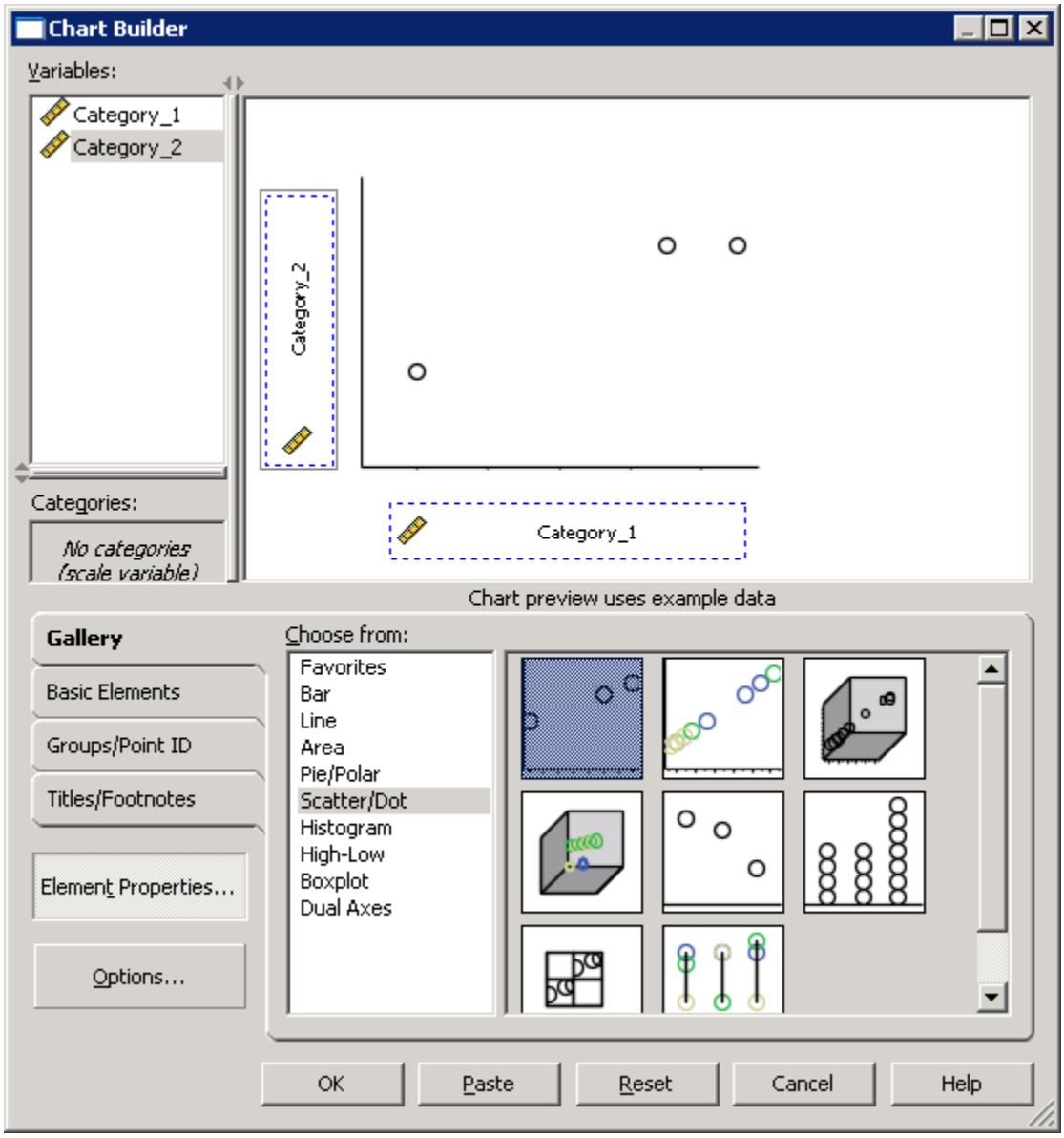

X-bar, R, s: Cases Are Units
x1
Process Measurement:
y
Subgroups Defined by:
x2
Identify points by:
Titles...
Options...
Control Rules...
Statistics...
Charts
X-bar using range
X-bar using standard deviation
Display R chart
Template
Apply chart template from:
File...
OK
Paste
Reset
Cancel
Help


X-bar, R, s: Statistics
Specification Limits
Upper:
Lower:
Target:
Capability Sigma
Estimate using R-bar
Estimate using S-bar
Using within subgroup variation
Actual % outside specification limits
Process Capability Indices
CP
CpM
CpU
Z-upper
CpL
Z-lower
K
Z-min
CpK
Z-max
CR
Z-out
Process Performance Indices
PP
Z-upper
PpU
Z-lower
PpL
Z-min
PpK
Z-max
PR
Z-out
PpM
Continue
Cancel
Help


X-bar, R, s: Control Rules
Select all control rules
Above +3 sigma
Below -3 sigma
2 out of last 3 above +2 sigma
2 out of last 3 below -2 sigma
4 out of last 5 above +1 sigma
4 out of last 5 below -1 sigma
8 points above center line
8 points below center line
6 in a row trending up
6 in a row trending down
14 in a row alternating
Continue
Cancel
Help

Creating Plots

1. Open or create the data you wish to analyze (see appropriate directions).
2. In SPSS select **Graphs> Chart Builder**.
3. Move the dependent variables into **Dependent:** box.
4. Move the independent variables into **Independent(s):** box.



Graph Builder uses “Drag and Drop” to choose the Chart Style, X-Axis, and Y-Axis.