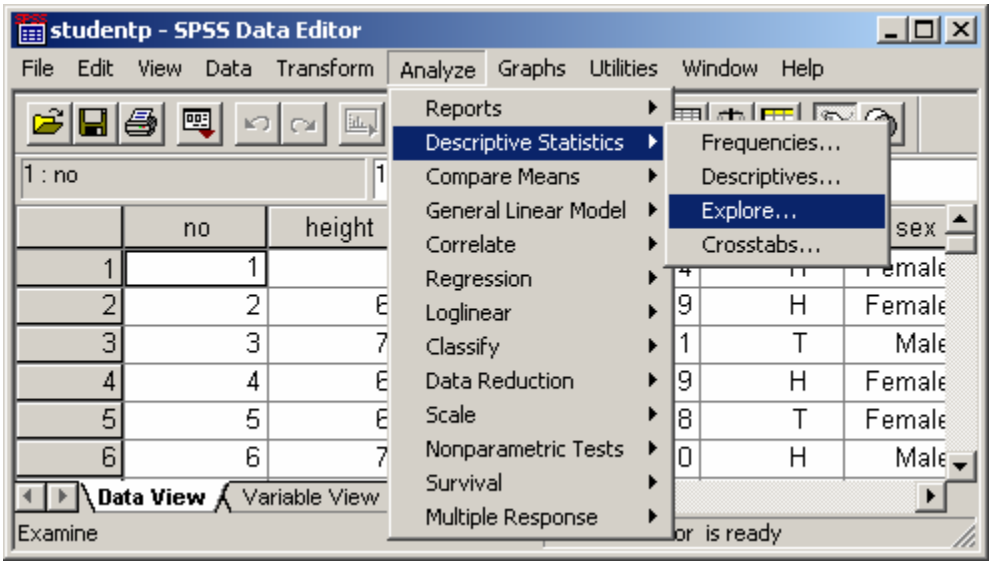
Data used in this guide**:** **studentp.sav** (**http://www.cc.ysu.edu/~ghchang/stat/studentp.sav**)

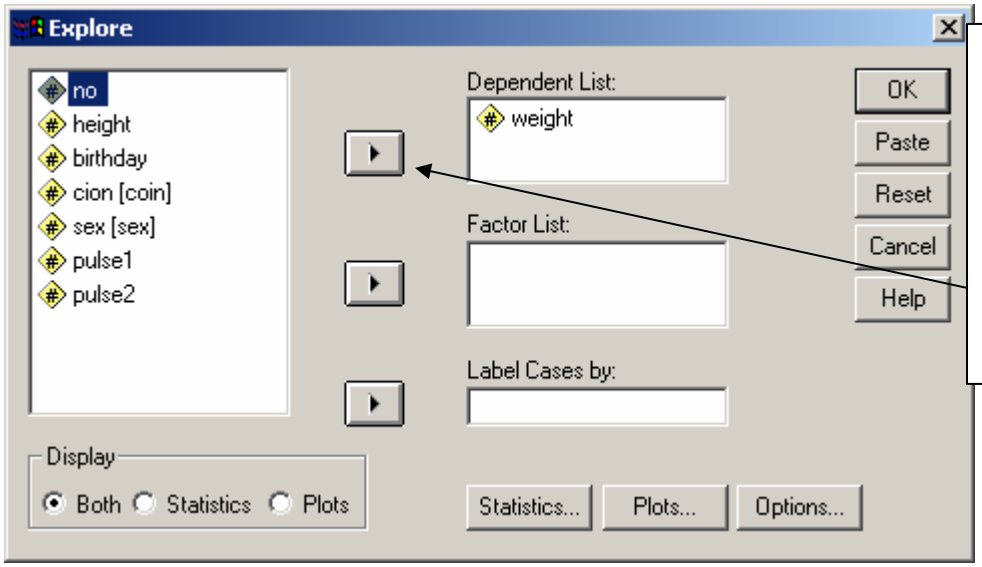
Organize and Display One *Quantitative* Variable (Descriptive Statistics, Boxplot & Histogram)

1. Move the mouse pointer on **Analyze**, click the left button of the mouse and move through the following menu selections:

   Analyze ⇨ Descriptive Statistics ⇨ Explore … (To perform Exploratory Analysis)

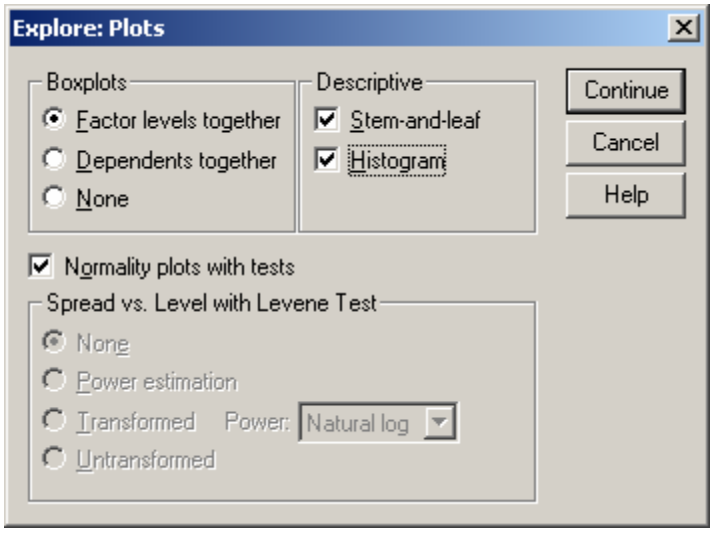


2. In the Explore dialog box, click and select the variable (weight) to be studied.



Click the variable to be selected from the list of variables on the left for analysis and click the select button, the button with a dark triangular shape in it, to select the variable into Dependent List box.

3. In the Explore dialog box, click **Plots…** button. In the Explore: Plots dialog box, check the **Histogram** and **Normality plots with tests**, if they are needed, and click on **Continue button**. If Sig. value (or *p*-value) in the normality test table is less than .05, it implies that data may **not** be from normally distributed population. The values .200 and .236 are *p*-values calculated based on tow different tests.



Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
WEIGHT	.127	22	.200*	.938	22	.236

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The distribution which the data was sampled from is not significantly different from normal.

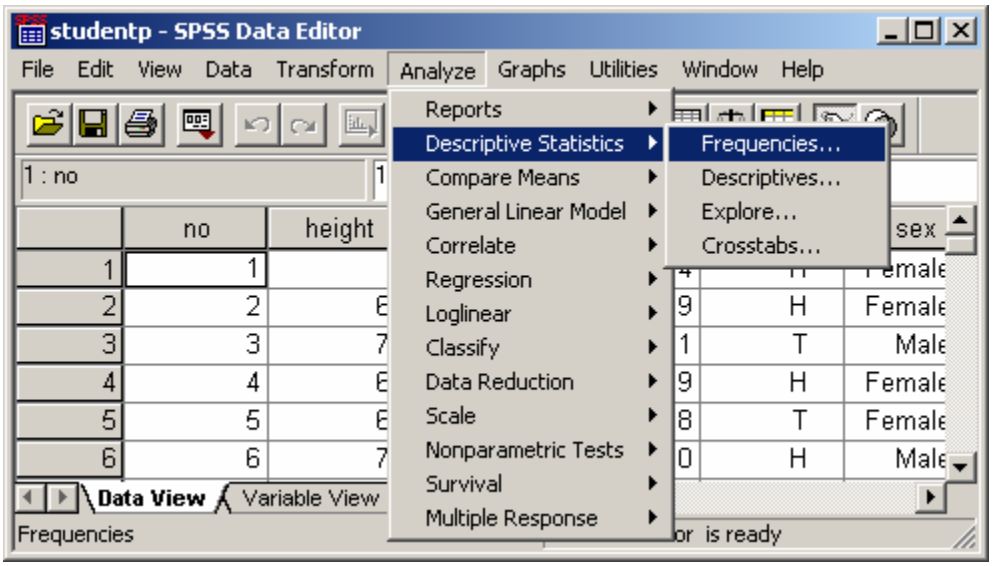
4. In the Explore dialog box, click on **OK** button. The SPSS will put the results, histogram, stemplot and descriptive statistics, in the OUTPUT window.

5. If one wishes to explore the quantitative variable for separate categories of a qualitative variable, select that qualitative variable and put it in the **Factor List** and click **OK**. (See the example in last two pages of this document.)

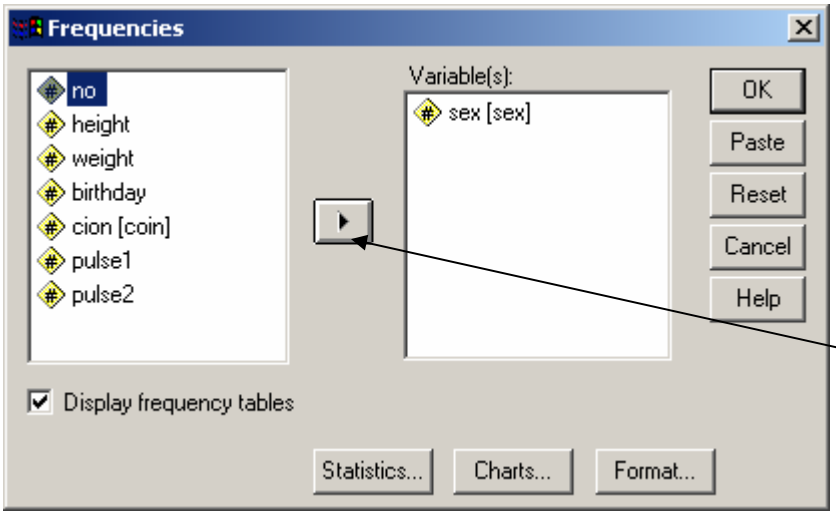
Organize and Display One Qualitative(Categorical) Variable (Pie or bar charts)

1. Move the mouse pointer on **Analyze**, click the left button of the mouse and move through the following menu selections:

   Analyze ⇨ Descriptive Statistics ⇨ Frequencies …

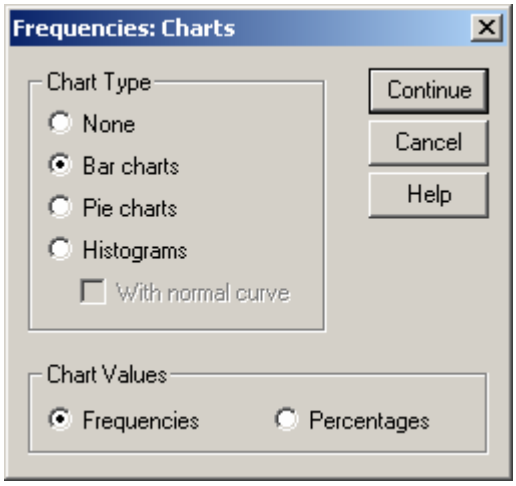


2. In the Frequencies dialog box, click and select the variable (sex) to be studied.



Click the variable to be selected for analysis from the list of variables on the left and click the select button, the button with a dark triangular shape in it, to select the variable into Variables(s) box.

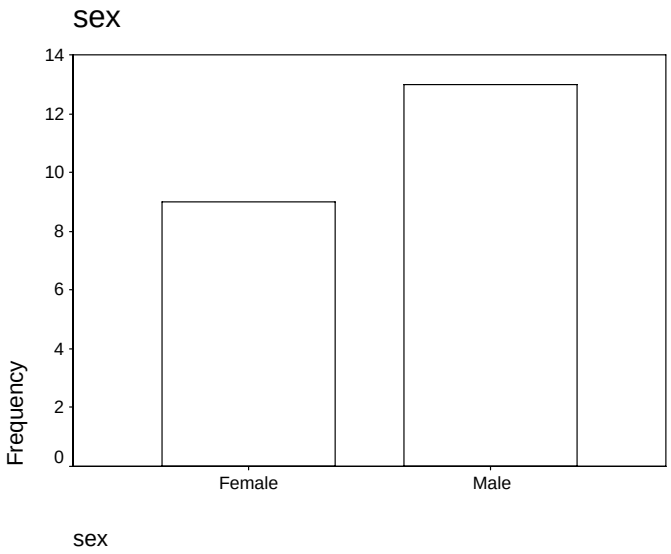
3. In the Frequencies dialog box, click **Charts…** button, if one wishes to display chart. In the Frequencies: Charts dialog box check on the desired chart and select either Frequencies or Percentages to be displayed and click **Continue** button.



4. In the Frequencies dialog box, click on OK button. The SPSS will put the results, frequency distribution table and bar chart (if checked), in the OUTPUT window.

sex

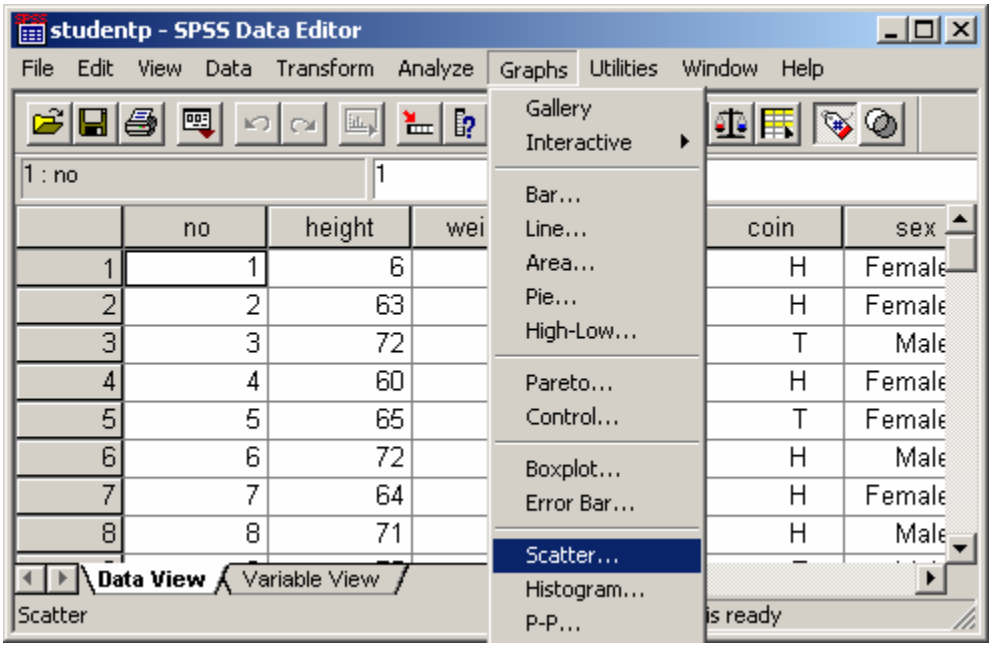
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	9	40.9	40.9	40.9
	Male	13	59.1	59.1	100.0
	Total	22	100.0	100.0	



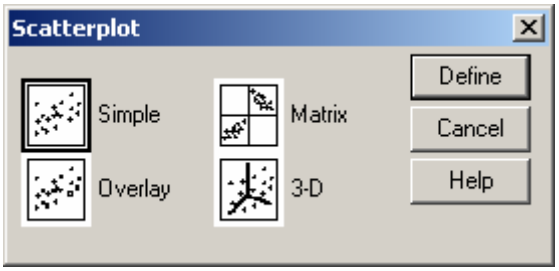
Examine Relation Between Two Quantitative Variables by Chart (Scatter Plot)

1. Click and move through the following menu selections:

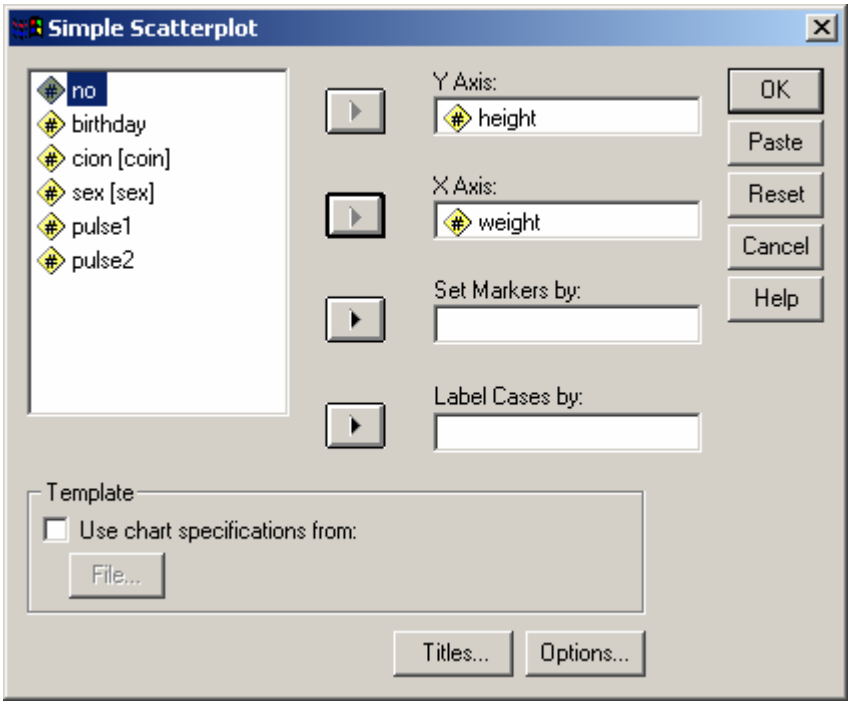
   Graphs ⇨ Scatter …



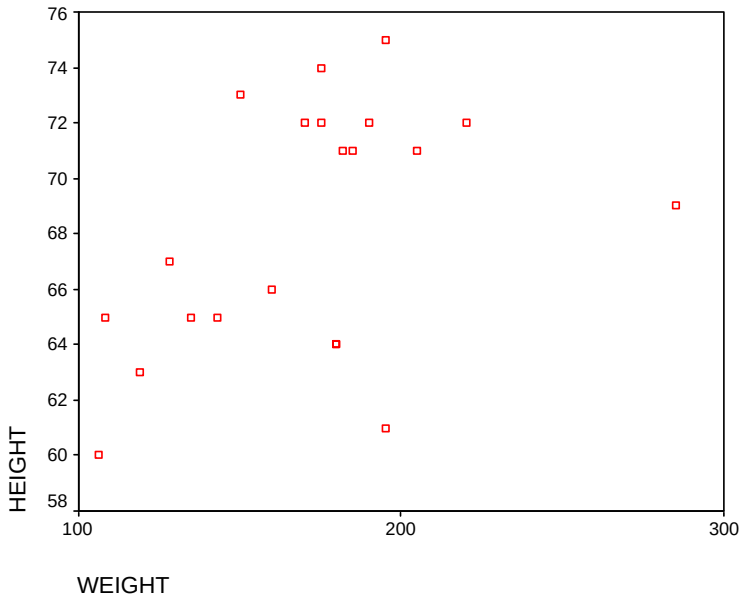
2. In Scatterplot dialog box, click the **Simple** option and click **Define** button.



3. In **Simple Scatterplot** dialog box, select the two variables (height and weight) to be studied. If one wishes to build a regression model for predicting height using weight variable, usually choose height variable for Y Axis (as response variable) and choose weight variable for X Axis (as explanatory variable). One can select sex variable for the **Set Markers by:** field to make scatter plot display scatter dots with different color for different sex.



4. In the Simple Scatterplot dialog box, click on **OK** button. The SPSS will put the scatter plot in the OUTPUT window. The following scatter plot is based on the data in **studentp.sav** file with the first case dropped, since the height information for the first case is incorrect.

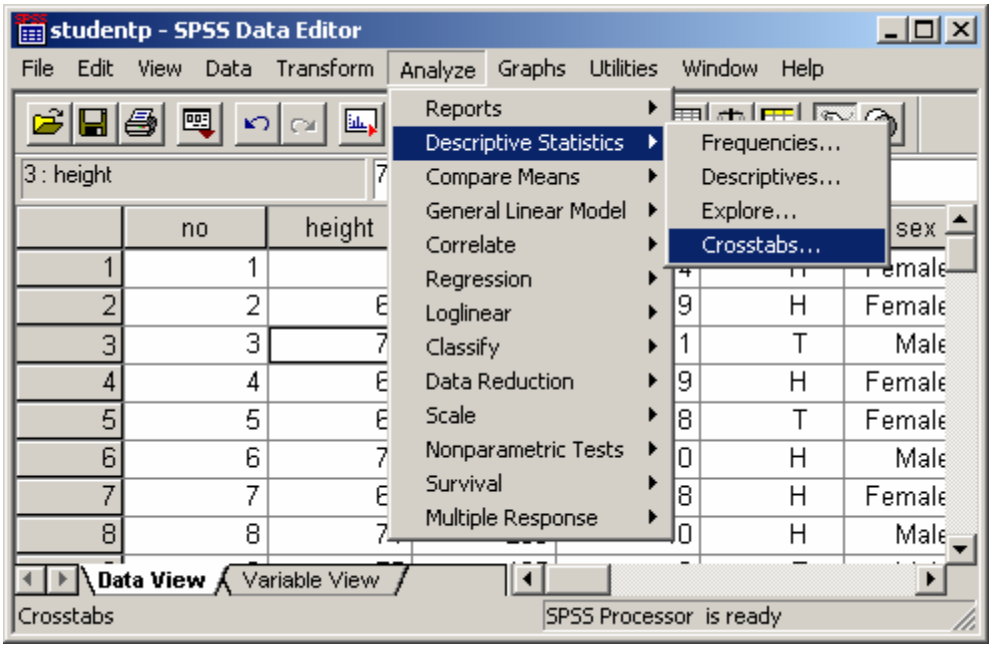


5. One can double click on the any part of the chart in the SPSS output window to bring up the chart editor for editing the scatter plot. A fitted line can be added to the chart using the **Chart** option in the chart editor menu bar.

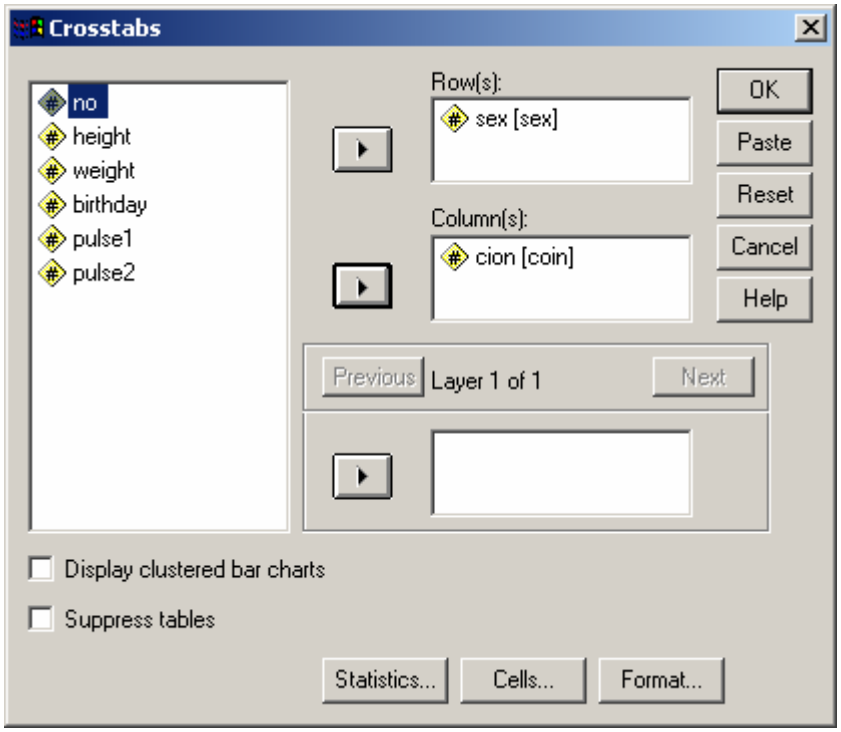
Examine Relation Between Two Qualitative Variables (Contingency Table and Cluster Bar Chart)

1. Click and move through the following menu selections:

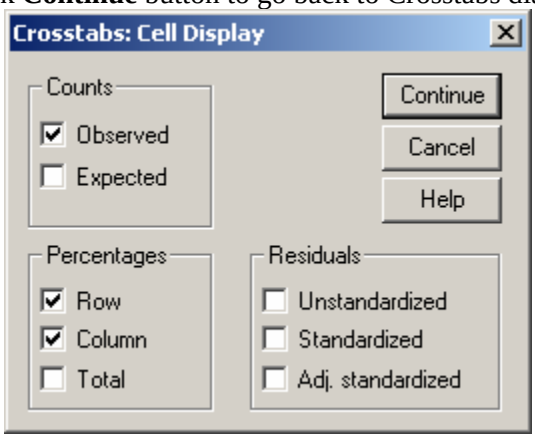
Analyze ⇨ Descriptive Statistics ⇨ Crosstabs …



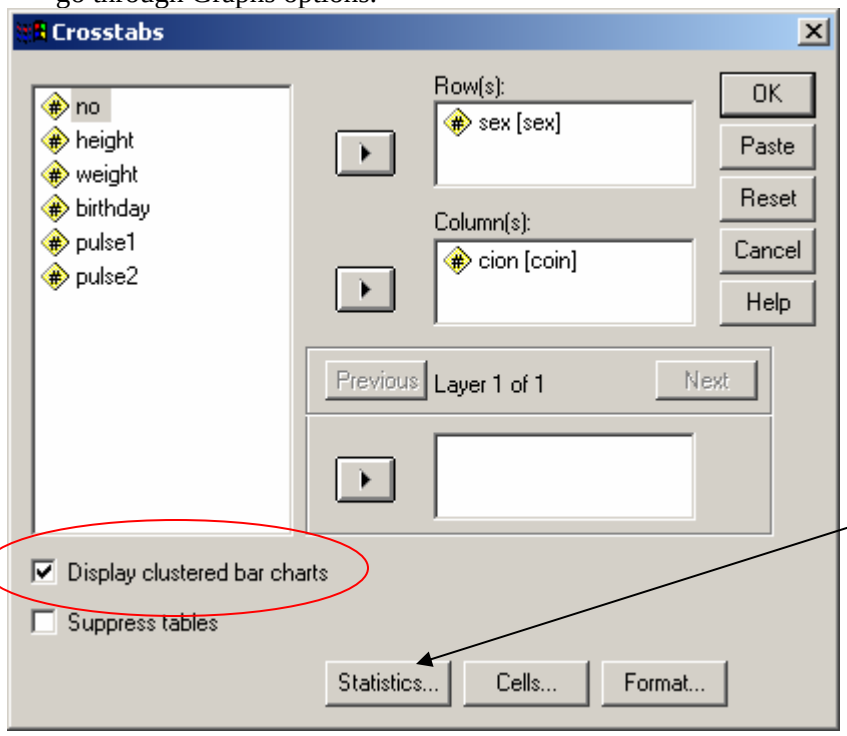
2. In Crosstabs dialog box, select the categorical variables for Row variable and Column variable, and click **OK** button.



3. In Crosstabs dialog box, click on **Cells …** button to specify whether or not to display the percentage information and then click **Continue** button to go back to Crosstabs dialog box.

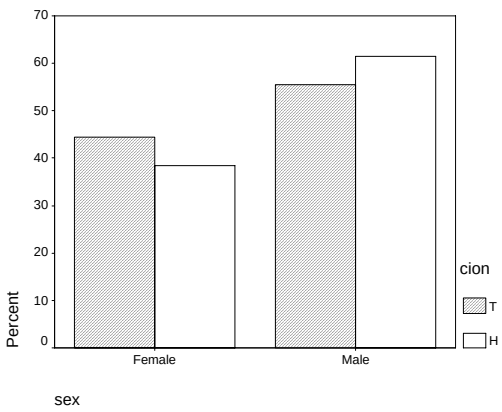


4. One can also check on **Display clustered bar charts** option in the Crosstabs dialog box to display clustered bar chart with only frequency (count) information. If percentages are needed be displayed, go through Graphs options.



To perform a chi-square test, click on **Statistics…** button and check the **Chi-square** box. The chi-square test results will be displayed in SPSS output window after clicking on OK from the Crosstabs diaglog box. .

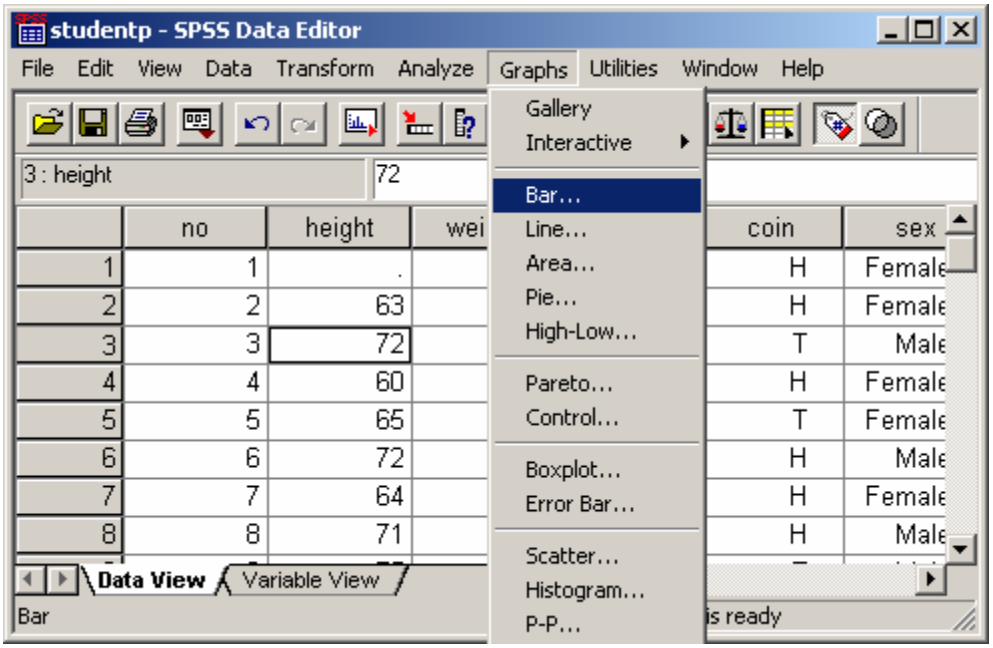
5. In the Crosstabs dialog box, click on **OK** button. The SPSS will put a contingency table and also a clustered bar chart in the OUTPUT window if the clustered bar chart box is checked.



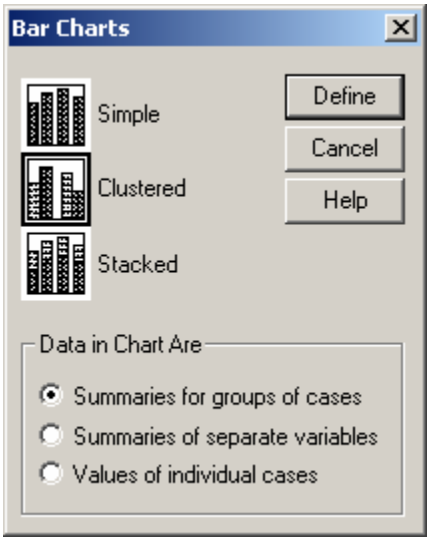
Clustered Bar Chart (Make a separate cluster bar chart)

1. Move the mouse pointer on **Graphs**, click the left button of the mouse and move through the following menu selections:

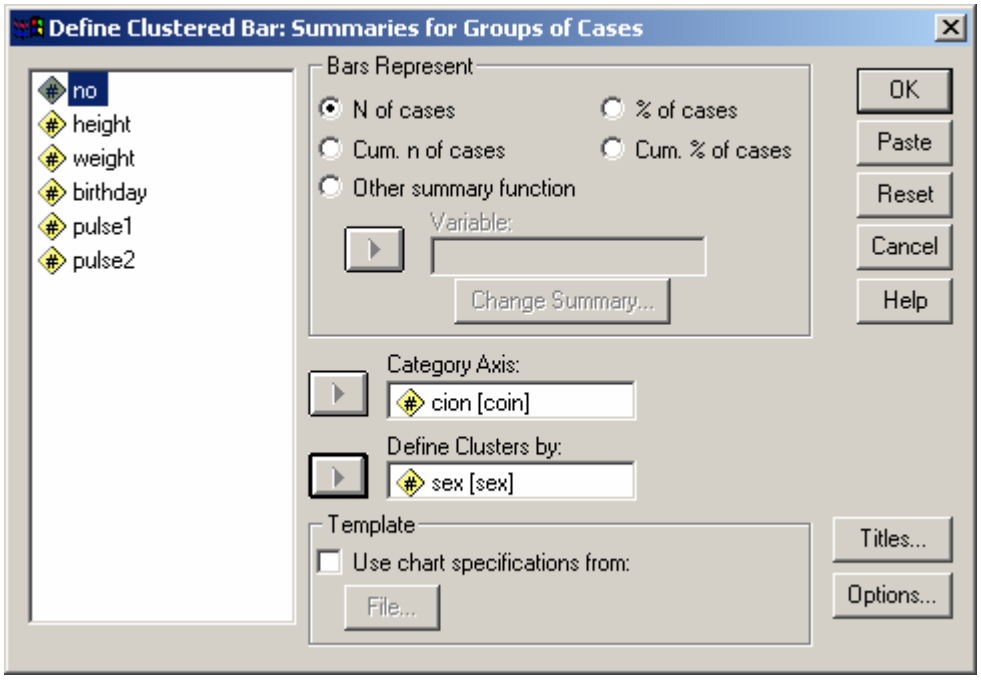
   Graphs ⇨ Bar …

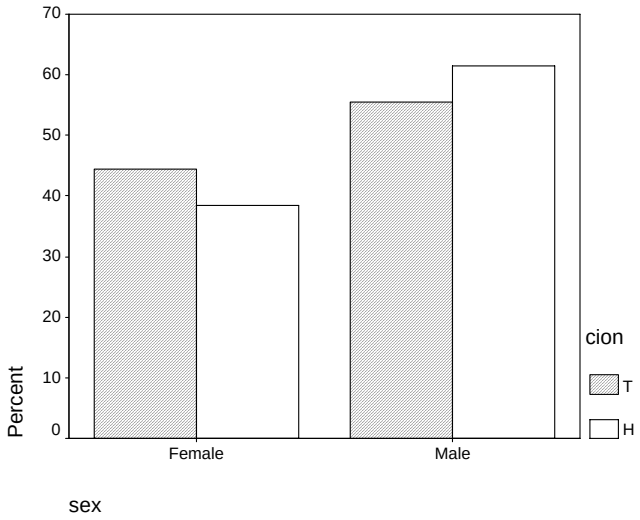


2. In Bar Charts dialog box, click the **Clustered** option. Check the **Data in Chart Are** option in Summaries for groups of cases and click **Define** button.



3. Select the two variables (sex and coin) to be studied. One can select sex variable for the Category Axis and coin variable for Clusters and check of **% of cases** and click **OK**. (Sometimes, percentage information are better for understanding the data)



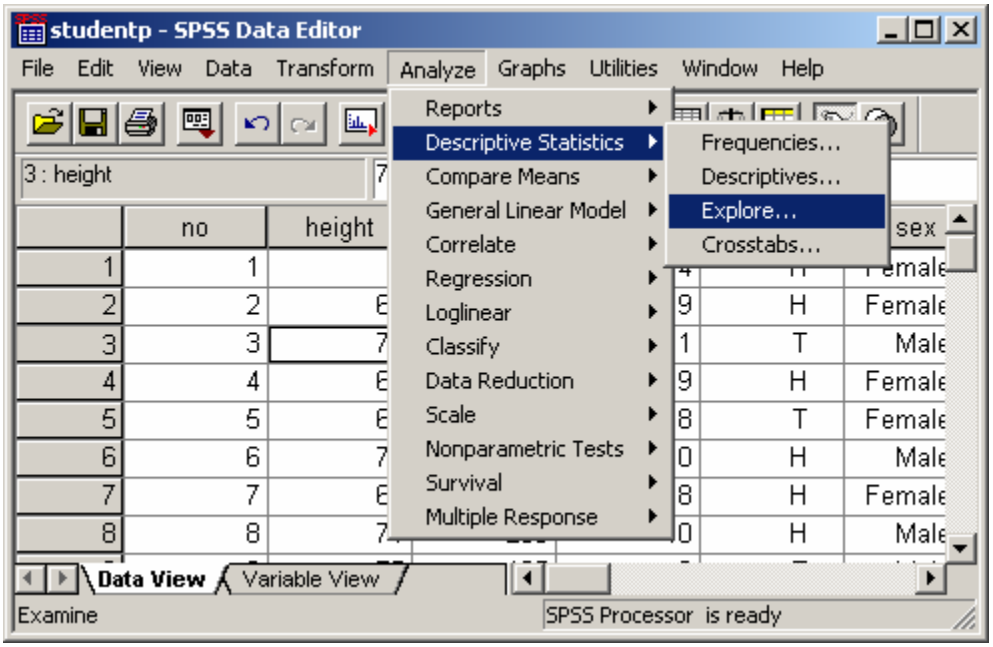


* Chart editor can be used to modify the chart and change the color or pattern in the chart. To activate the chart editor, one can simply double click any part of the chart in the SPSS Output window.

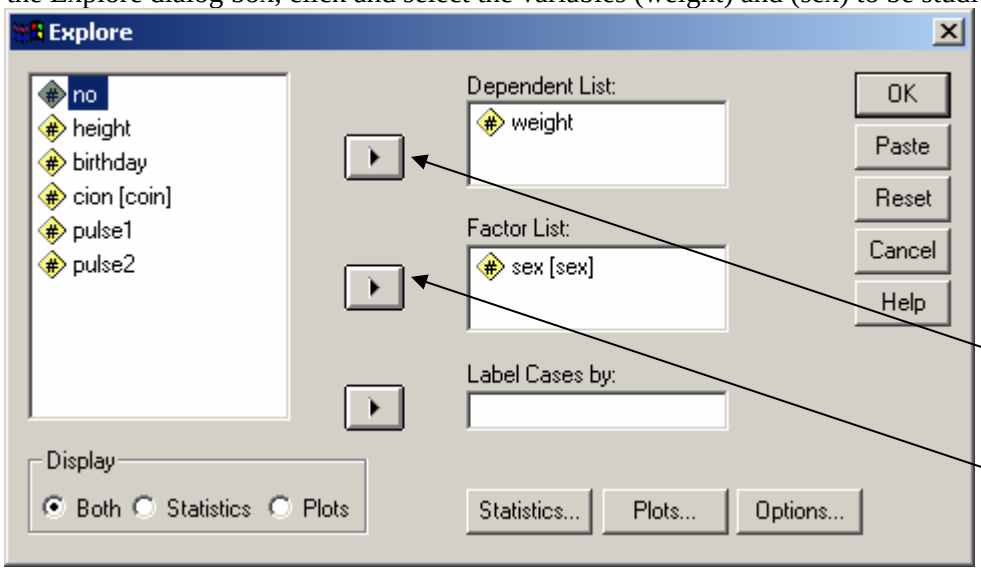
Examine Relation Between One *Quantitative* Variable with One Qualitative Factor Variable (Side-by-side boxplot, descriptive measures for sub-categories.)

1. Move the mouse pointer on **Analyze**, click the left button of the mouse and move through the following menu selections:

   Analyze ⇨ Descriptive Statistics ⇨ Explore … (To perform Exploratory Analysis)

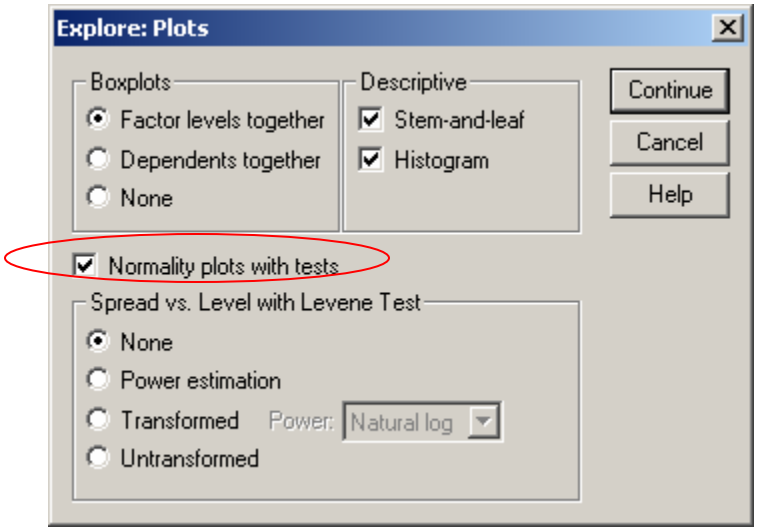


2. In the Explore dialog box, click and select the variables (weight) and (sex) to be studied.



Click the variable to be selected (weight) from the list of variables on the left for analysis and click the select button, the button with a dark triangular shape in it, to select the variable into Dependent List box. Select the sex variable in Factor List box to observe the difference between the weights from both genders.

3. In the Explore dialog box, click **Plots…** button. In the **Explore: Plots** dialog box, check the **Histogram** and **Normality plots with tests**, if they are needed, and click on **Continue button**. If Sig. value (or *p*-value) in the normality test table is less than .05, it implies that data may **not** be from normally distributed population.



4. In the Explore dialog box, click on **OK** button. The SPSS will put the results, histograms, stemplots, descriptive statistics, and side-by-side boxplot in the OUTPUT window.

Descriptives

	sex			Statistic	Std. Error
weight	Female	Mean		134.89	7.983
		95% Confidence Interval for Mean	Lower Bound	116.48	
			Upper Bound	153.30	
		5% Trimmed Mean		133.99	
		Median		135.00	
		Variance		573.611	
		Std. Deviation		23.950	
		Minimum		106	
		Maximum		180	
		Range		74	
		Interquartile Range		38	
		Skewness		.705	.717
		Kurtosis		.173	1.400
	Male	Mean		192.85	9.035
		95% Confidence Interval for Mean	Lower Bound	173.16	
			Upper Bound	212.53	
		5% Trimmed Mean		190.11	
		Median		185.00	
		Variance		1061.141	
		Std. Deviation		32.575	
		Minimum		150	
		Maximum		285	
		Range		135	
		Interquartile Range		25	
		Skewness		1.990	.616
		Kurtosis		5.449	1.191

* Tests of normality for weight variable, one for male and one for female.

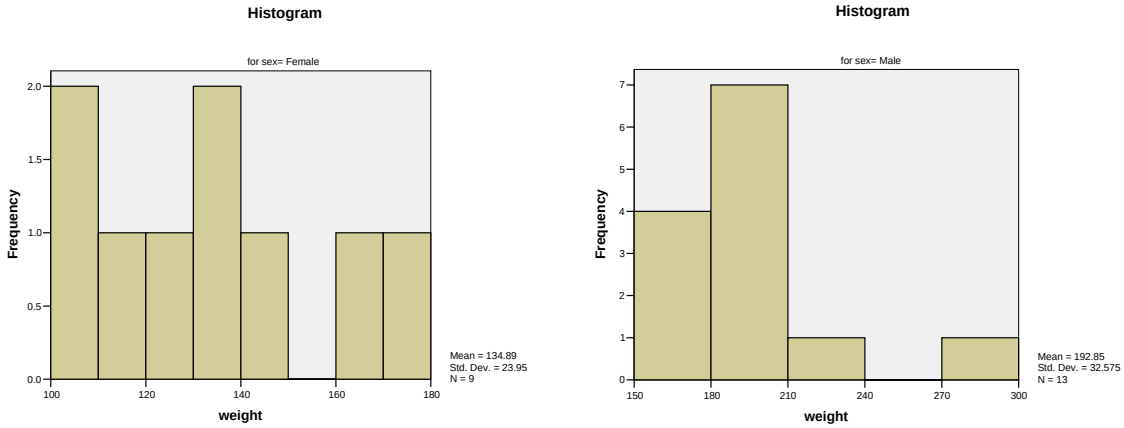
Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	sex	Statistic	df	Sig.	Statistic	df	Sig.
weight	Female	.165	9	.200*	.945	9	.633
	Male	.243	13	.035	.812	13	.010

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

* Two histograms for weights, one for male and one for female.



* Side-by-side box plot for comparing weight between male and female students.