SPSS TUTORIAL

MathCracker.com

Scatter Plot
Regression
ANOVA
GLM
Recoding Data

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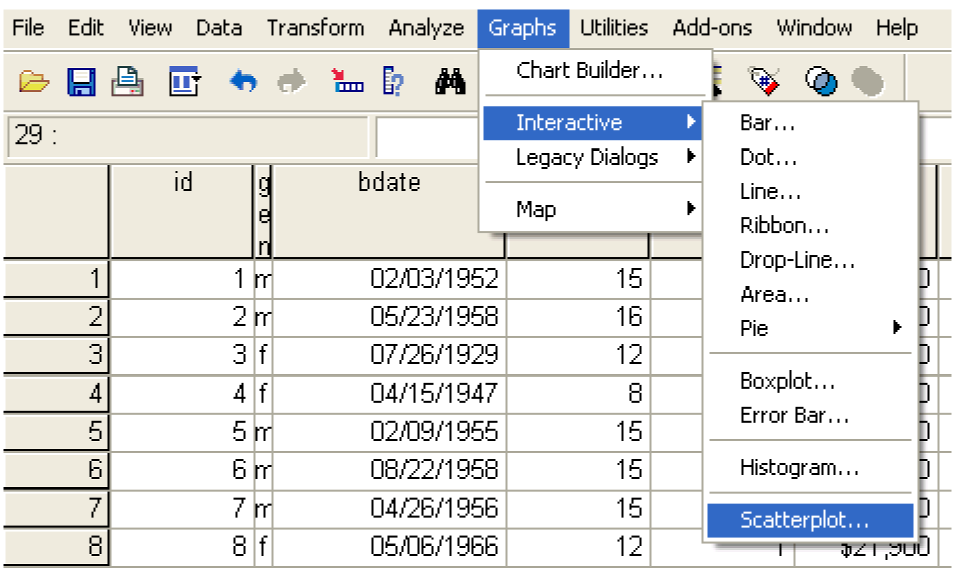
1. Scatter Plot

A scatter plot may help you to understand how well linear regression fits your data. You may find that a quadratic equation would be more appropriate than a linear one.

Procedure

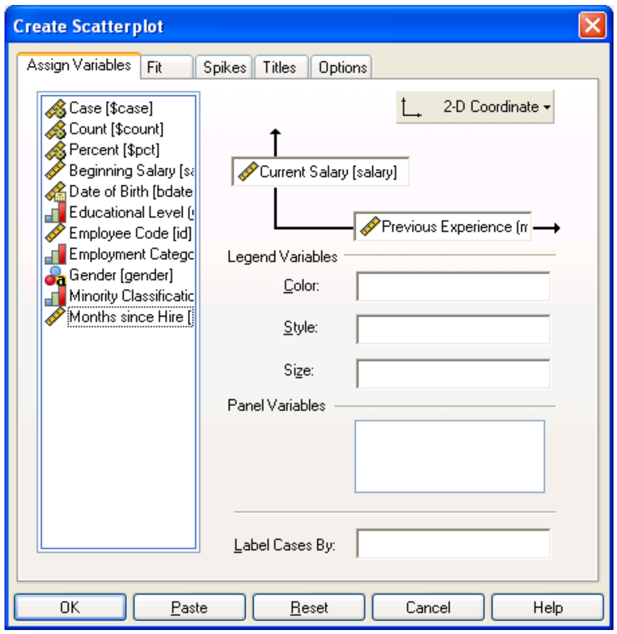
For example in this section we shall create a scatter plot for Employee Data.sav from SPSS data sample. Once the Employee Data.sav dataset is open, pull down the **Graphs** menu and point to **Interactive** and click on **Scatterplot** option.



Create Scatterplot dialog will appear. There are 5 tabs in Create Scatterplot dialog; assign variable, fit, spikes, title and option.

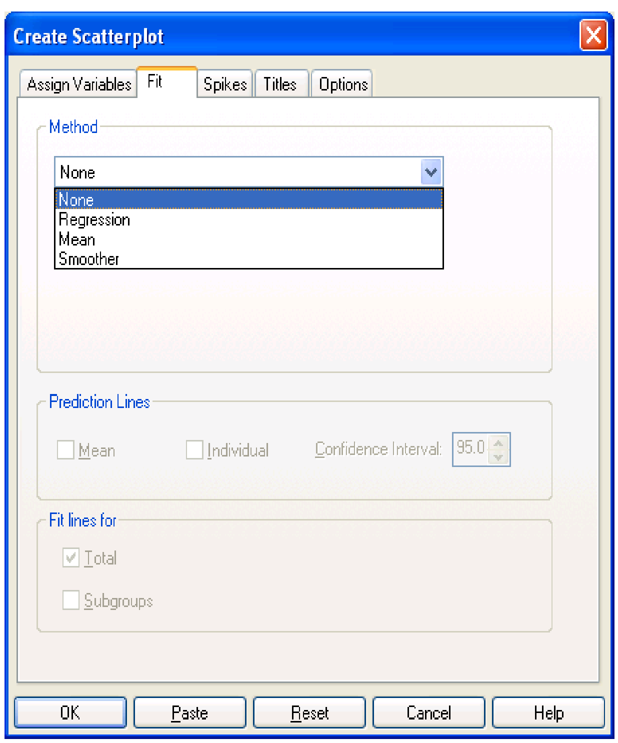
Assign Variable

On Assign variable you can select scatter plot coordinate between 2-D or 3-D, and then assign variable for each axis. If you select 2-D coordinate you must choose the variables you want on the X-axis and Y-axis , and if you select 3-D coordinate you must choose the variables you want on the X-axis and Y-axis. Drag and Drop variable name into axis field. This tutorial demonstrate sample for 2-D scatterplot, we have chosen 'previous experience' vs 'salary' from employee data. sav



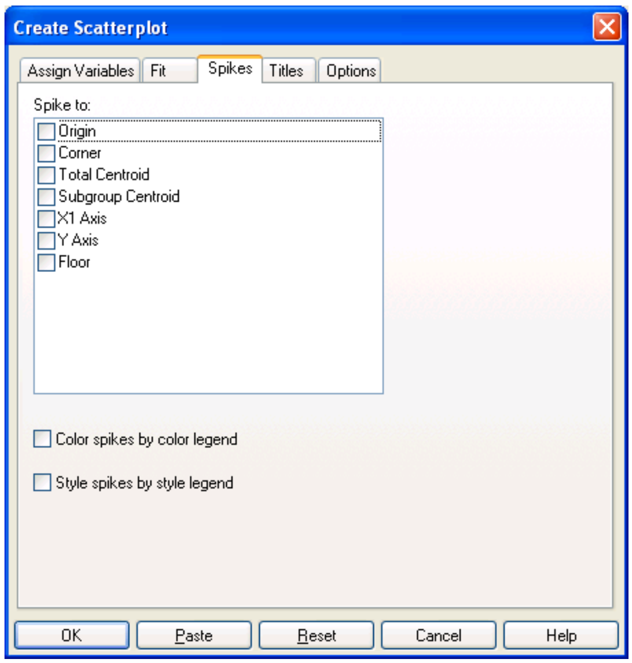
Fit

Select fit method, there are 4 options; None, Regression, Mean and Smoother. Select **None** for this case



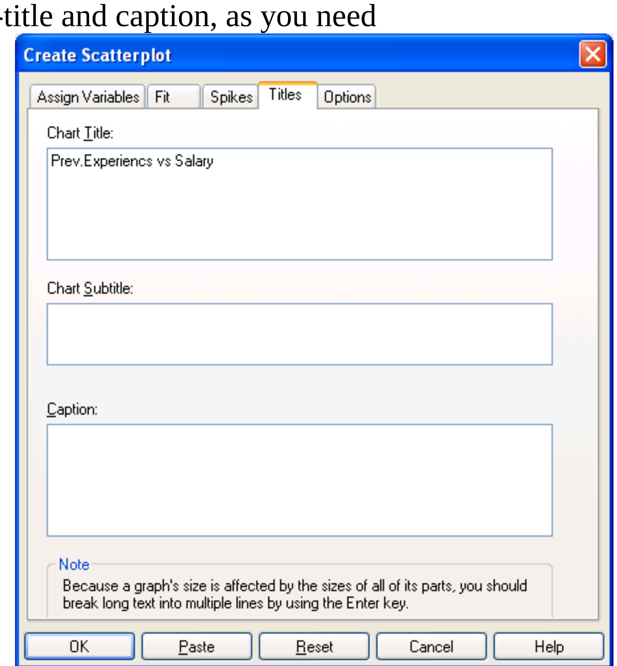
Spikes

Use spikes options if you want to mark spikes data



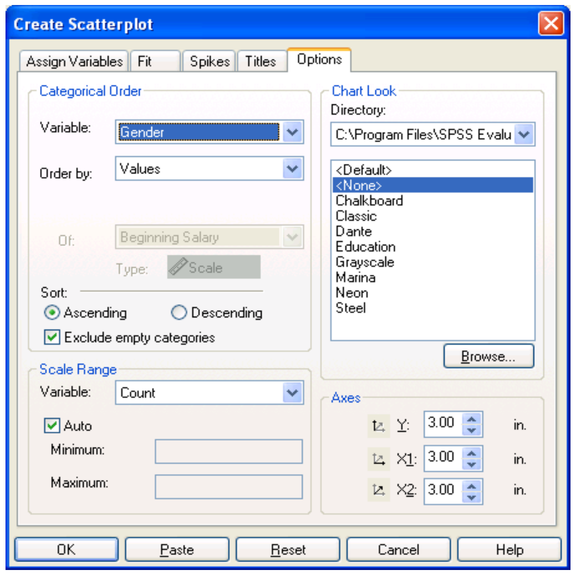
Titles

Fill on chart title, chart sub-title and caption, as you need



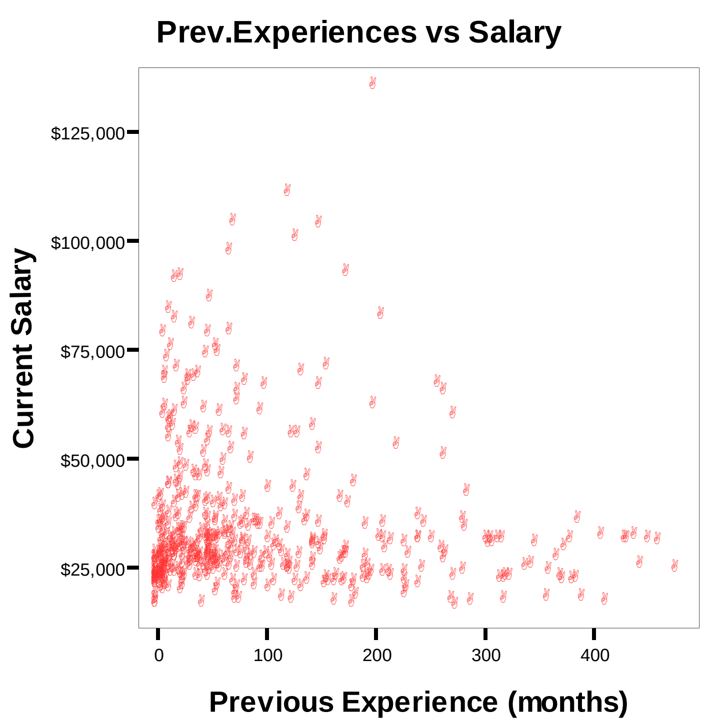
Options

Select options as you need and then click **OK** to produce scatter plot diagram



Output

Scatter plot diagram will appear on output window

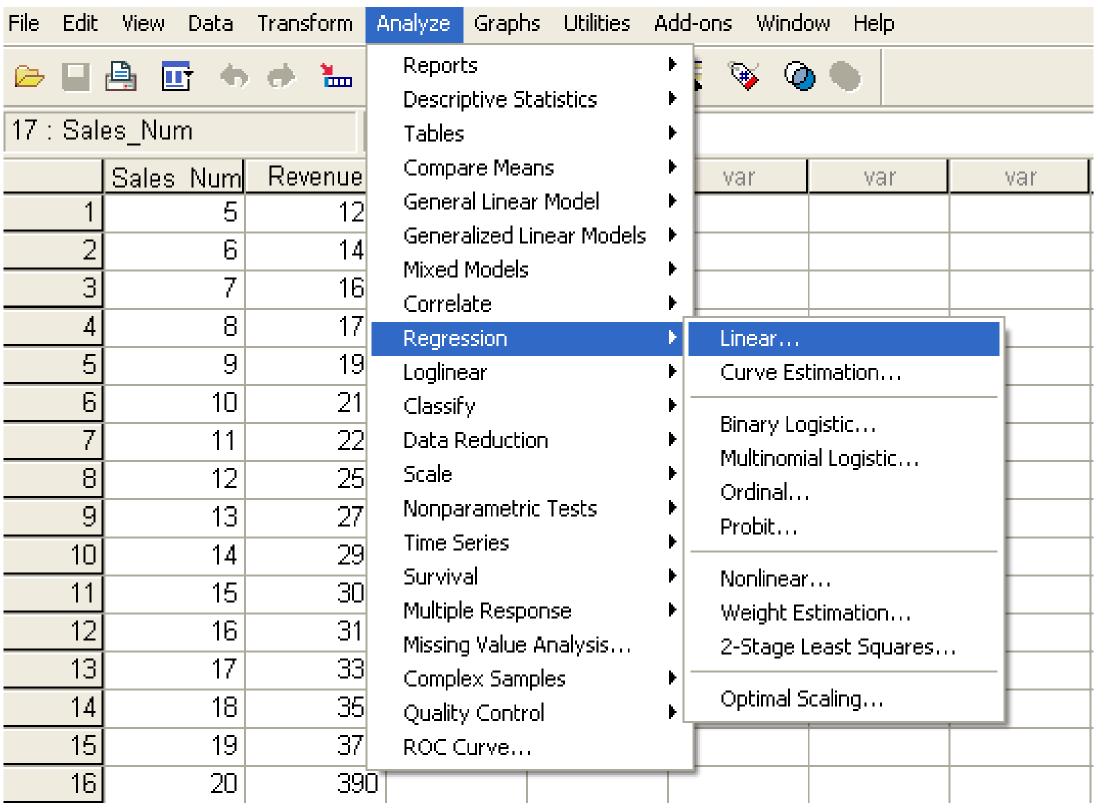


2. Linear Regression

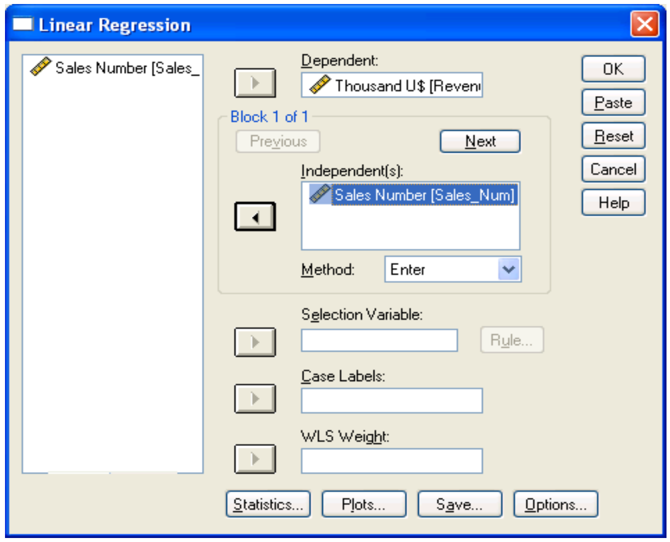
This tutorial will explain two types of linear regression, there are simple linear regression and multiple linear regression.

Simple Linear Regression

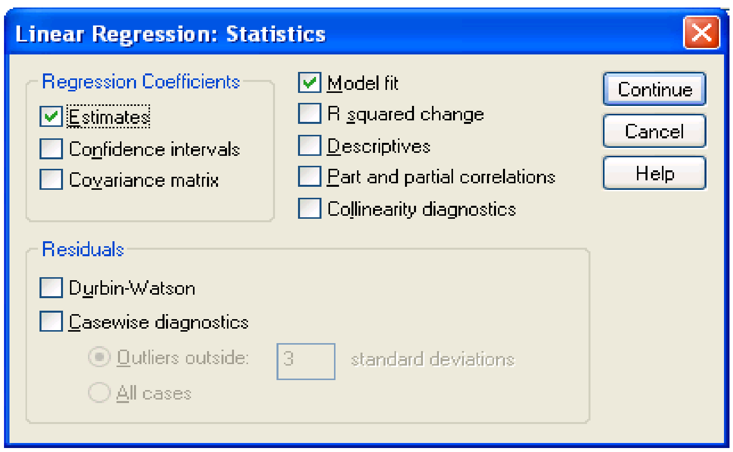
Linear regression it is possible to output the regression coefficients necessary to predict one variable from the other. To do linear regression click on **Analyze => Regression => Linear**.



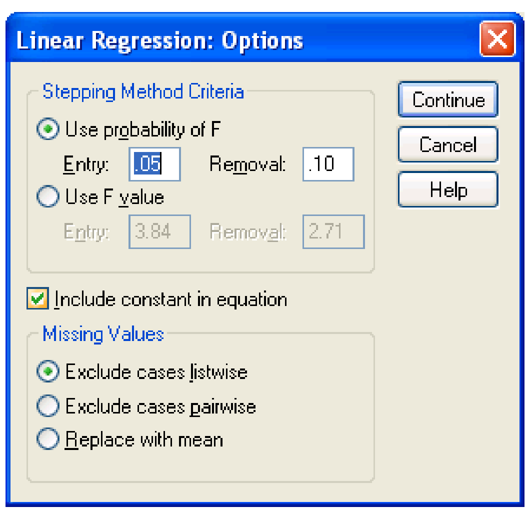
- Linear Regression Dialog will appear. Further, there is a need to know which variable will be used as the dependent variable and which will be used as the independent variable(s). In our current example, Revenue will be the dependent variable, and Sales Number will act as the independent variable.



- Click on **Statistics** button, and select **Estimates** and **Model fit** (as default)



- Click **Continue** button
- Click **Options** button and define confidence interval for F-test



- Click **Continue**
- Click **OK** and output will appear

Output

Output for this case is:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.998(a)	.997	.996	5.106

a Predictors: (Constant), Sales Number

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	107974.944	1	107974.944	4140.871	.000(a)
	Residual	365.056	14	26.075		
	Total	108340.000	15			

a Predictors: (Constant), Sales Number
b Dependent Variable: Thousand U$

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	34.243	3.690		9.281	.000
	Sales Number	17.821	.277	.998	64.350	.000

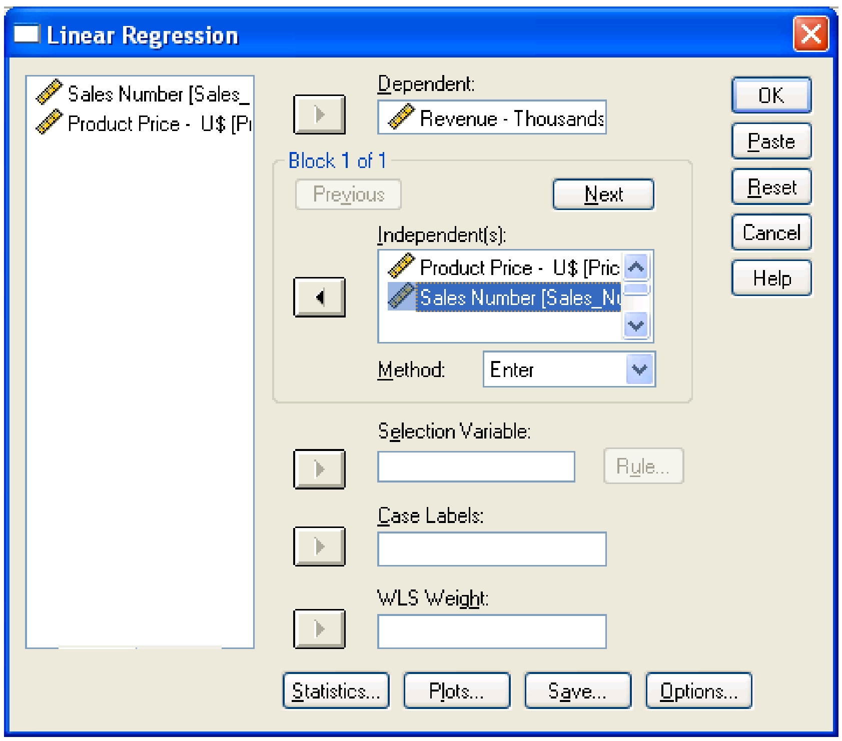
a Dependent Variable: Thousand U$

Linear Regression Formula Model for this case is :

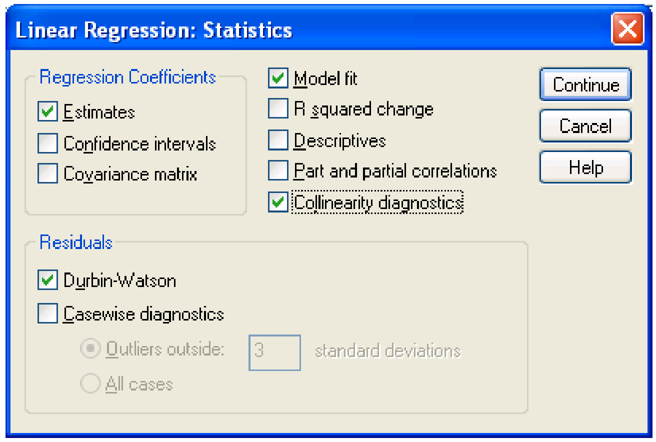
Y=34.243 + 17.821X

Multiple Linear Regression

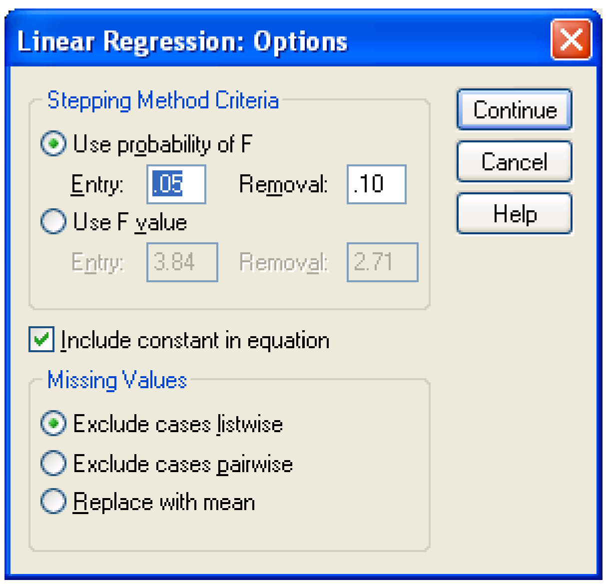
- Click on **Analyze => Regression => Linear**.
- In this case we use **revenue** as **dependent variable**, **product price** and **sales number** as independent(s) variable.



- Click on **Statistics** button and select Estimates, Model Fit,Colineary diagnostics and Durbin-Watson



- Click **Continue** button
- Click **Options** button and define confidence interval for F-test



- Click **Continue**
- Click **OK** and output will appear

Output

Model Summary(b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.993(a)	.986	.983	5.758	1.910

a Predictors: (Constant), Sales Number, Product Price - U$

b Dependent Variable: Revenue - Thousands U$

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27662.125	2	13831.063	417.148	.000(a)
	Residual	397.875	12	33.156		
	Total	28060.000	14			

a Predictors: (Constant), Sales Number, Product Price - U$
b Dependent Variable: Revenue - Thousands U$

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta	Tolerance	VIF	B	Std. Error
1	(Constant)	60.444	12.710		4.756	.000		
	Product Price - U$	-.396	.113	-.143	-3.491	.004	.703	1.42 2
	Sales Number	11.313	.436	1.064	25.945	.000	.703	1.42 2

a Dependent Variable: Revenue - Thousands U$

Formula Model for this case is:

Y=30.444+11.313X(sales number) – 0.143X(product price)

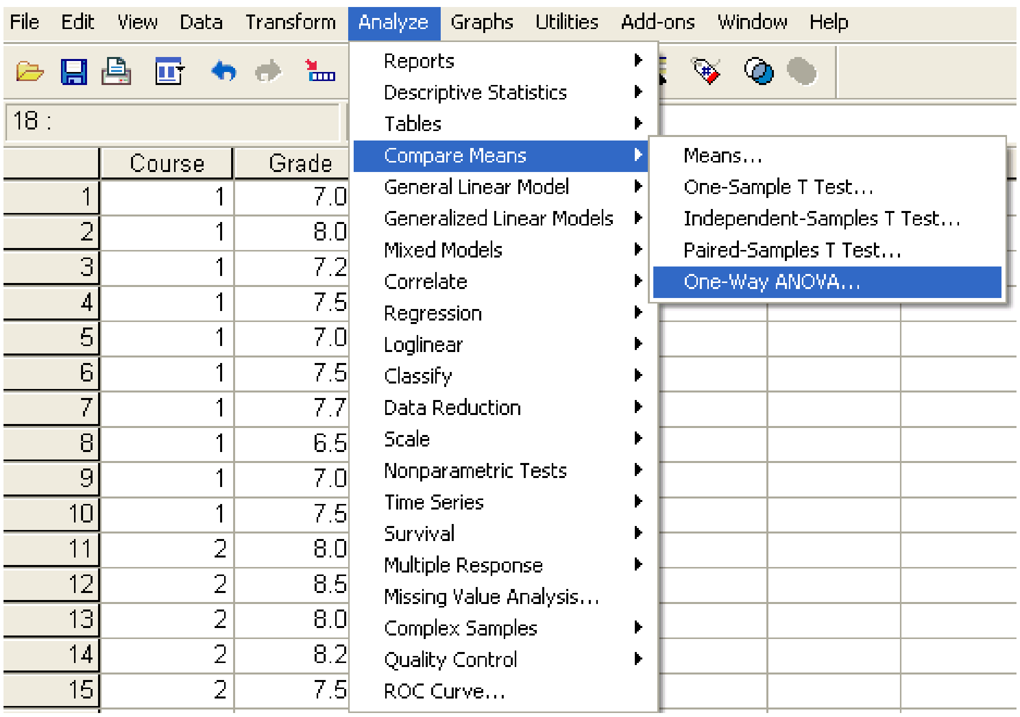
3. ANOVA

analysis of variance (ANOVA) is a collection of statitical model and their associated procedures, in which the observed varianceis partitioned into components due to different explanatory variables.

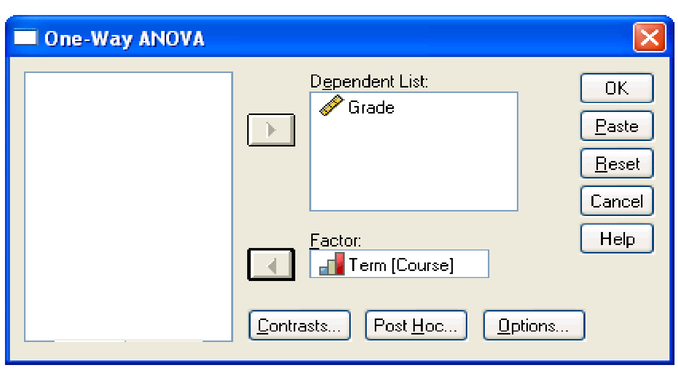
Example case for this section is research about relationship between course period and grade. There are 3 kinds of course; 3 month, 6 month and 9 month.

One Way ANOVA

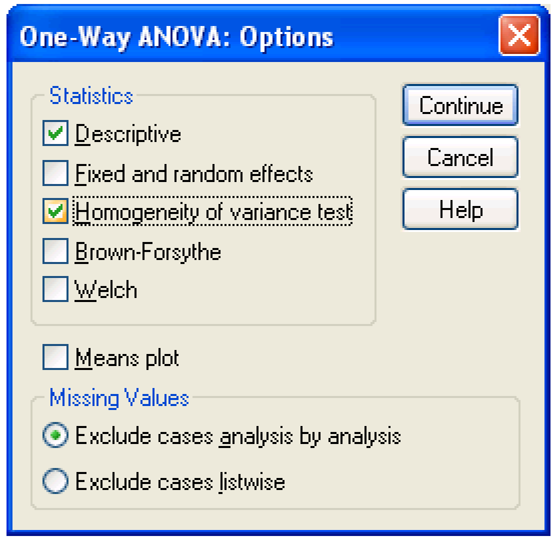
- Click on **Analyze => Compare Means => One-Way ANOVA**



- One-Way ANOVA dialog will appear, select **Grade** variable as dependent list and **Course** variable as factor



- Click **Option** and select **Descriptive** and **Homogenety of variance test**



- Click **Continue**
- Click **Post Hoc** and select **LSD**
- Click **Continue**
- Click **Contrast** and enter **coefficients number** 0 and click **Add**, then enter coeeficient number -1 and 1.
- Click **Continue**
- Click **OK,** and output will appear

Output

Descriptives

Grade

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
3 Months	10	7.3000	.43780	.13844	6.9868	7.6132	6.50	8.00
6 Months	10	8.0750	.42573	.13463	7.7704	8.3796	7.50	8.75
9 Months	10	8.8750	.44488	.14068	8.5568	9.1932	8.00	9.50
Total	30	8.0833	.77774	.14200	7.7929	8.3737	6.50	9.50

ANOVA

Grade

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.404	2	6.202	32.595	.000
Within Groups	5.138	27	.190		
Total	17.542	29			

Test of Homogeneity of Variances

Grade

Levene Statistic	df1	df2	Sig.
.006	2	27	.994

Multiple Comparisons

Dependent Variable: Grade
LSD

(I) Term	(J) Term	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
3 Months	6 Months	-.77500(*)	.19508	.000	-1.1753	-.3747
	9 Months	-1.57500(*)	.19508	.000	-1.9753	-1.1747
6 Months	3 Months	.77500(*)	.19508	.000	.3747	1.1753
	9 Months	-.80000(*)	.19508	.000	-1.2003	-.3997
9 Months	3 Months	1.57500(*)	.19508	.000	1.1747	1.9753
	6 Months	.80000(*)	.19508	.000	.3997	1.2003

* The mean difference is significant at the .05 level.

Contrast Coefficients

Contrast	Term		
	3 Months	6 Months	9 Months
1	0	-1	1

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Grade	Assume equal variances	1	.8000	.19508	4.101	27	.000
	Does not assume equal variances	1	.8000	.19472	4.108	17.965	.001

4. General Linear Model (GLM)

This tutorial will explain four types of GLM, there are; GLM Univariate-Fixed Factor(s), GLM Univariate-UNCOVA, GLM-Multivariate and GLM-Repeates Measures.

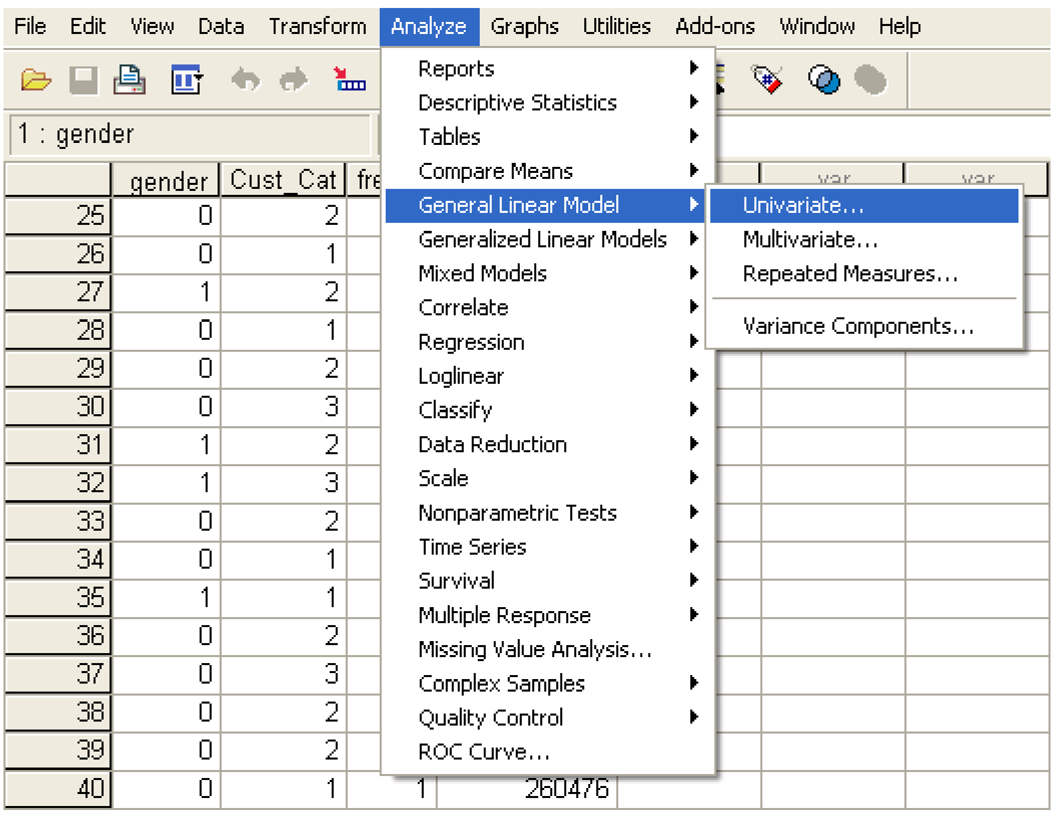
GLM-Univariate

GLM-Univariate analysis is regression analysis and variance one dependent variable with two or more factor variable or other variables**.**

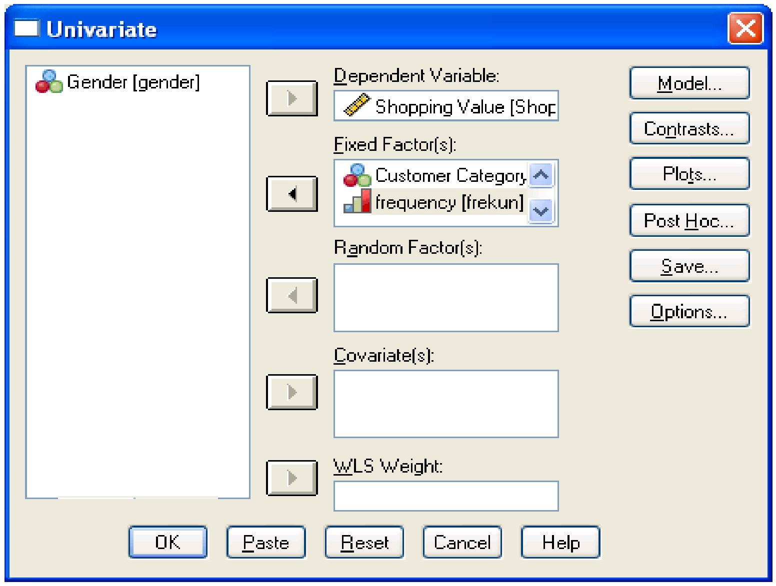
GLM Univariate-Fixed Factor(s)

Example case for univariate-fixed factor is to know customer shopping trend.

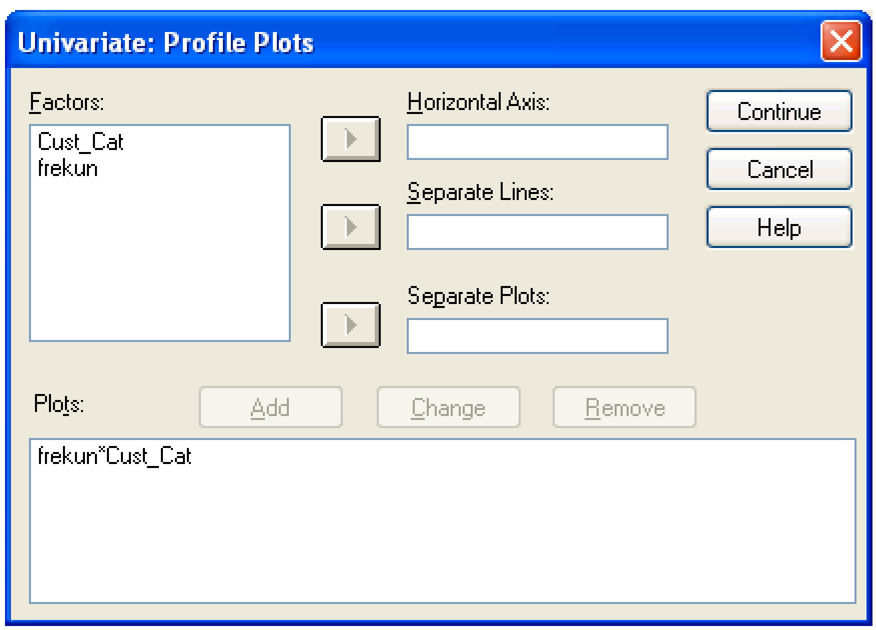
- Click on **Analyze => General Linear Model => Univariate**



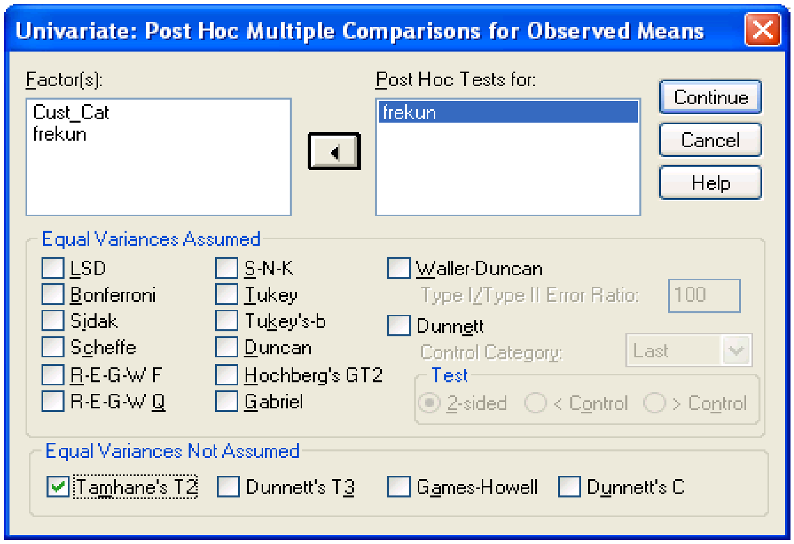
- Uniavariate dialog will appear, select **shopping value** as dependent variable, **frequency** and **customer category** variable as fixed factor(s).



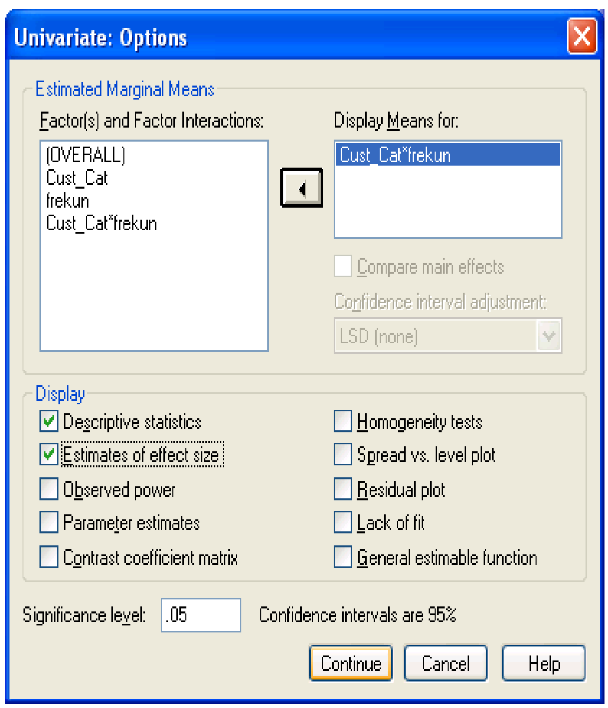
- Click **Plots** and Univariate: Profile Plots dialog will appear, enter **frequency** variable into horizontal axis and **customer category (Cust_Cat)** into separate lines and then click **Add**. frequency*cust_cat variable will move into Plots box.



- Click **Continue**
- Click **Post Hoc** and Univariate:Post Hoc dialog will appear, Select Equal Variances Assumed – **Turkey** and Equal Variance Not Assumed - **Tamhane**



- Click **Continue**
- Click **Option** and Univariate:Option dialog will appear, move frequency*Cat_Cus from Factor(s) and Factor Interactions box into Display Means for box. Select Descriptive statistic, Estimates of effect size, Homogenety test and spread vs level plot in Display groupbox.



- Click **Continue**
- Click **OK** and output will appear

Output

Between-Subjects Factors

		Value Label	N
Customer Category	1	individu	337
	2	couple	287
	3	family	176
frequency	1	once-two weeks	187
	2	once-a week	461
	3	several - a week	152

Descriptive Statistics

Dependent Variable: Shopping Value

Customer Category	frequency	Mean	Std. Deviation	N
individu	once-two weeks	241549.03	51076.881	86
	once-a week	267907.85	47644.510	191
	several - a week	297827.14	46527.810	60
	Total	266508.14	51569.954	337
couple	once-two weeks	298406.07	50142.015	61
	once-a week	324952.65	47765.161	165
	several - a week	342457.78	48419.239	61
	Total	323030.95	50393.788	287
family	once-two weeks	384409.50	69602.060	40
	once-a week	400183.56	78776.554	105
	several - a week	421745.30	68918.993	31
	Total	400396.35	75637.588	176
Total	once-two weeks	290654.37	77743.025	187
	once-a week	318453.06	75860.179	461
	several - a week	341010.90	69289.815	152
	Total	316241.11	76812.882	800

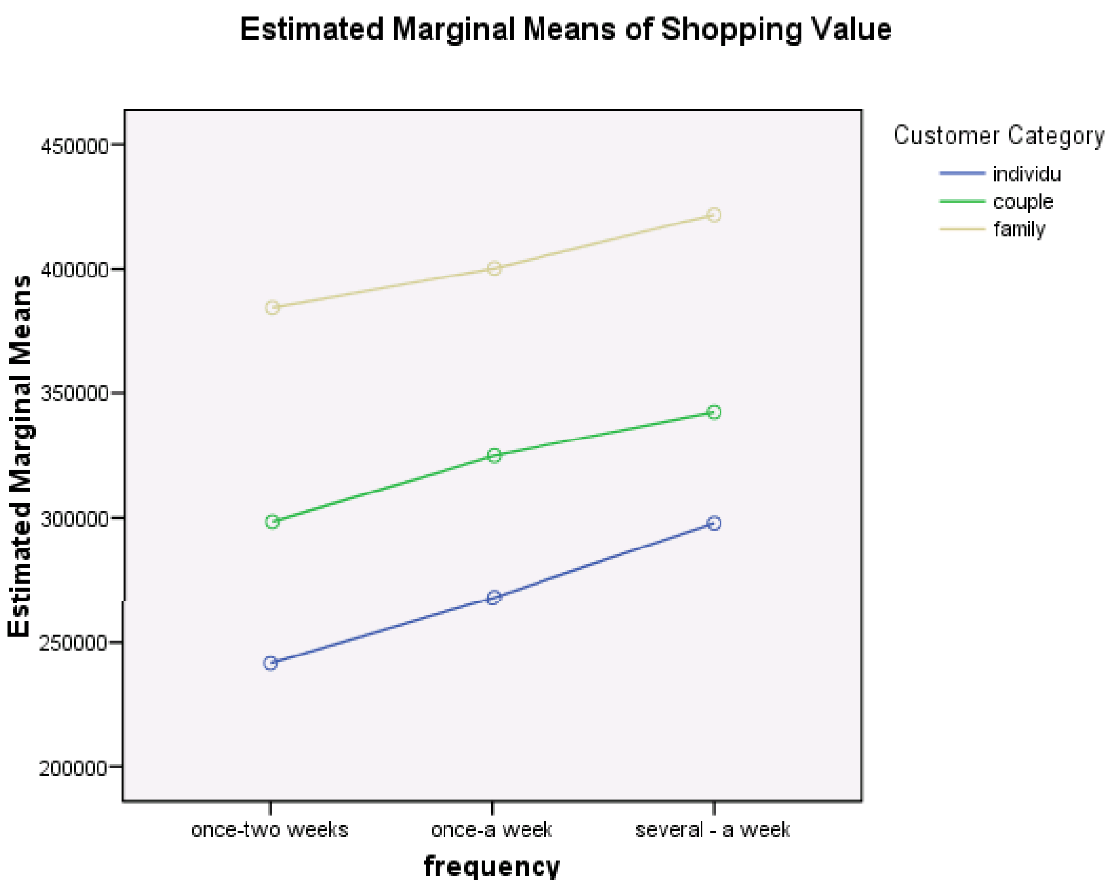
Tests of Between-Subjects Effects

Dependent Variable: Shopping Value

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2290985375127.443(a)	8	286373171890.930	93.477	.000	.486
Intercept	63790494928399.500	1	63790494928399.500	20822.226	.000	.963
Cust_Cat	1597826286944.965	2	798913143472.483	260.778	.000	.397
frekun	161125943235.640	2	80562971617.820	26.297	.000	.062

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Cust_Cat * frekun	6899347068.037	4	1724836767.009	.563	.690	.003
Error	2423289514093.421	791	3063577135.390			
Total	84721024114141.800	800				
Corrected Total	4714274889220.860	799				

a R Squared = .486 (Adjusted R Squared = .481)



Customer Category * frequency

Dependent Variable: Shopping Value

Customer Category	frequency	Mean	Std. Error	95% Confidence Interval	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
individu	once-two weeks	241549.033	5968.500	229833.061	253265.004
	once-a week	267907.849	4004.956	260046.250	275769.447
	several - a week	297827.138	7145.601	283800.554	311853.721
couple	once-two weeks	298406.073	7086.789	284494.936	312317.210
	once-a week	324952.647	4308.960	316494.299	333410.996

Customer Category	frequency	Mean	Std. Error	95% Confidence Interval	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
family	several - a week	342457.775	7086.789	328546.639	356368.912
	once-two weeks	384409.496	8751.539	367230.510	401588.483
	once-a week	400183.564	5401.567	389580.464	410786.665
	several - a week	421745.298	9941.080	402231.281	441259.316

Multiple Comparisons

Dependent Variable: Shopping Value
Tamhane

(I) frequency	(J) frequency	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
once-two weeks	once-a week	-27798.69(*)	6693.576	.000	-43861.00	-11736.37
	several - a week	-50356.53(*)	7994.172	.000	-69540.69	-31172.37
once-a week	once-two weeks	27798.69(*)	6693.576	.000	11736.37	43861.00
	several - a week	-22557.84(*)	6638.469	.002	-38504.28	-6611.40
several - a week	once-two weeks	50356.53(*)	7994.172	.000	31172.37	69540.69
	once-a week	22557.84(*)	6638.469	.002	6611.40	38504.28

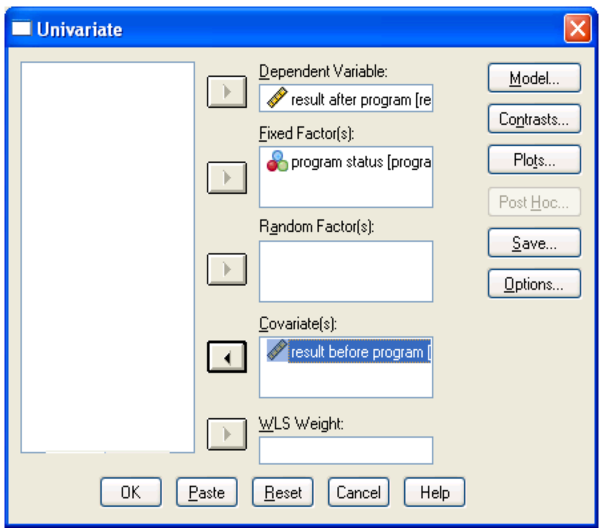
Based on observed means.
* The mean difference is significant at the .05 level.

For further assistance in SPSS, you can contact the guys at MYGEEKYTUTOR.COM

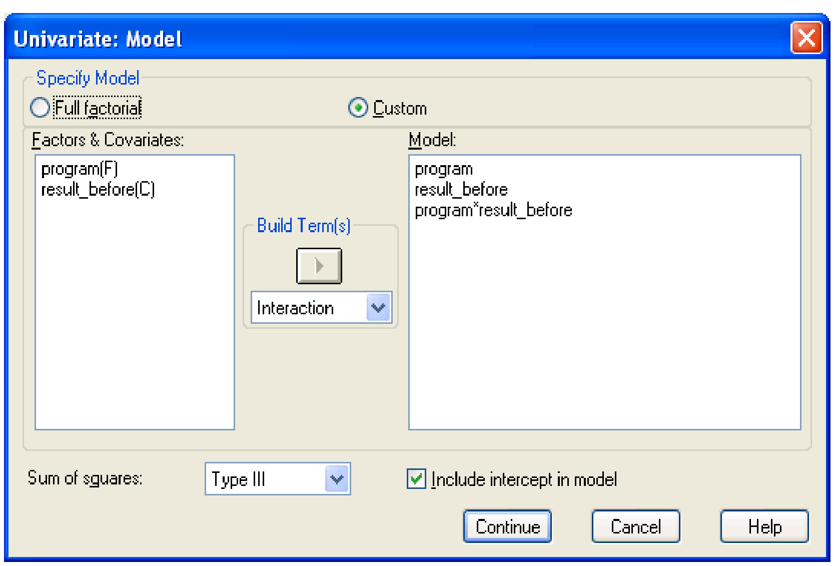
GLM Univariate-UNCOVA

Example case for this section is research about house hold income before and after participate in government program.

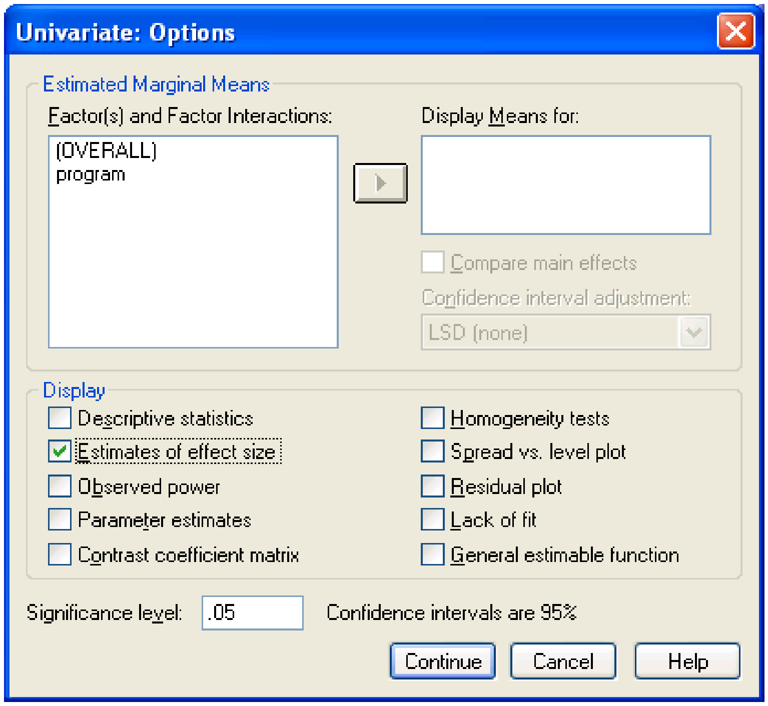
- Click on **Analyze => General Linear Model => Univariate**
- Enter r**esult_after** as dependent variable, **program status** variable as Fix Factor(s) and **result_before** as Covariate(s)



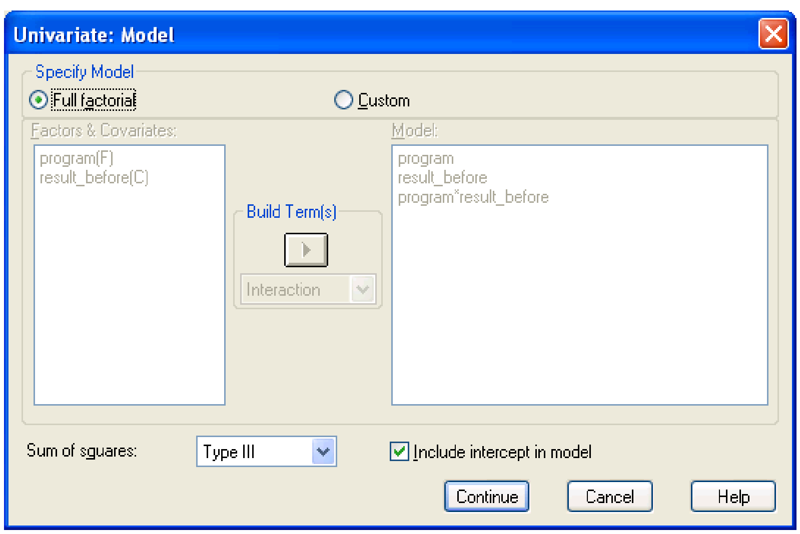
- Click **Models** and Univariate: Models dialog will appear, Select **Custom** in Specify Model. Select **program** variable move into Model box, select **result_before** and move into Model box. Select both program variable and result_before and move into Model box and then **program*result_before** variable will appear. Select **Interaction** on the Build Term(s) dropdown.



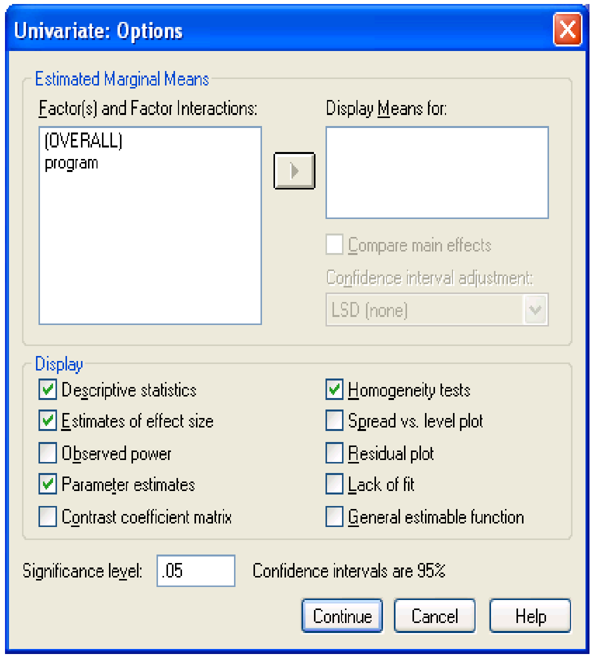
- Click **Continue**
- Click **Options** and select Estimates of effect size.



- Click **Continue**
- Click **OK** and output will appear.
- The next step is covarian analysis. Open Univariate dialog again click **Model** and select **Full Factorial** in Specify model.



- Click **Continue**
- Click **Option** and select Descriptive statistics, Estimates of effect size, Homogenety test, and Parameter Estimates.



- Click **Continue**
- Click **OK** and output will appear.

Output

Between-Subjects Factors

		Value Label	N
program status	0	not participate	293
	1	participate	307

Tests of Between-Subjects Effects

Dependent Variable: result after program

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	16557688.729(a)	3	5519229.576	220.962	.000	.527
Intercept	291519.199	1	291519.199	11.671	.001	.019
program	114931.433	1	114931.433	4.601	.032	.008
result_before	9598160.112	1	9598160.112	384.262	.000	.392
program * result_before	11836.725	1	11836.725	.474	.491	.001
Error	14886973.771	596	24978.144			
Total	453042500.000	600				
Corrected Total	31444662.500	599				

a R Squared = .527 (Adjusted R Squared = .524)

Descriptive Statistics

Dependent Variable: result after program

program status	Mean	Std. Deviation	N
not participate	728.84	194.917	293
participate	942.67	210.011	307
Total	838.25	229.118	600

Levene's Test of Equality of Error Variances(a)

Dependent Variable: result after program

F	df1	df2	Sig.
.605	1	598	.437

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
a Design: Intercept+result_before+program

Tests of Between-Subjects Effects

Dependent Variable: result after program

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	16545852.004(a)	2	8272926.002	331.499	.000	.526
Intercept	285238.337	1	285238.337	11.430	.001	.019
result_before	9691004.737	1	9691004.737	388.322	.000	.394
program	6459841.024	1	6459841.024	258.848	.000	.302
Error	14898810.496	597	24956.131			
Total	453042500.000	600				
Corrected Total	31444662.500	599				

a R Squared = .526 (Adjusted R Squared = .525)

Parameter Estimates

Dependent Variable: result after program

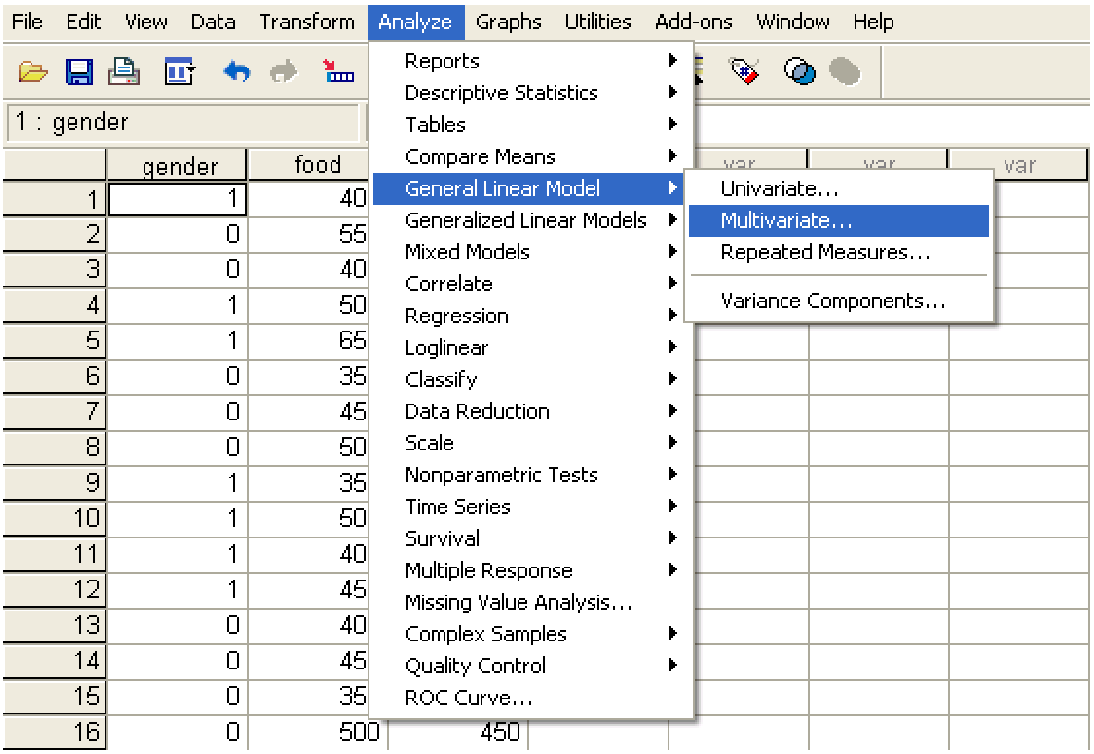
Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
Intercept	227.856	37.378	6.096	.000	154.448	301.264	.059
result_before	1.587	.081	19.706	.000	1.429	1.745	.394
[program=0]	-207.641	12.906	-16.089	.000	-232.987	-182.294	.302
[program=1]	0(a)	.	.	.	.	.	.

a This parameter is set to zero because it is redundant.

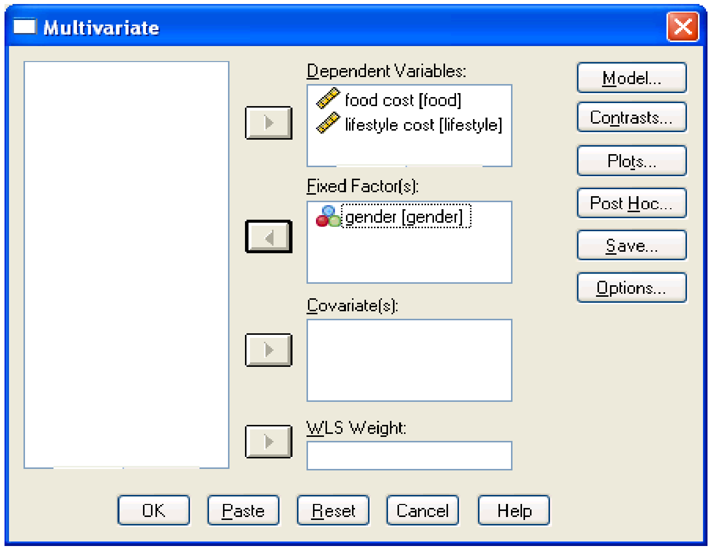
GLM Multivariate

Example case for this section is research about the impact of gender factor to expense for life style.

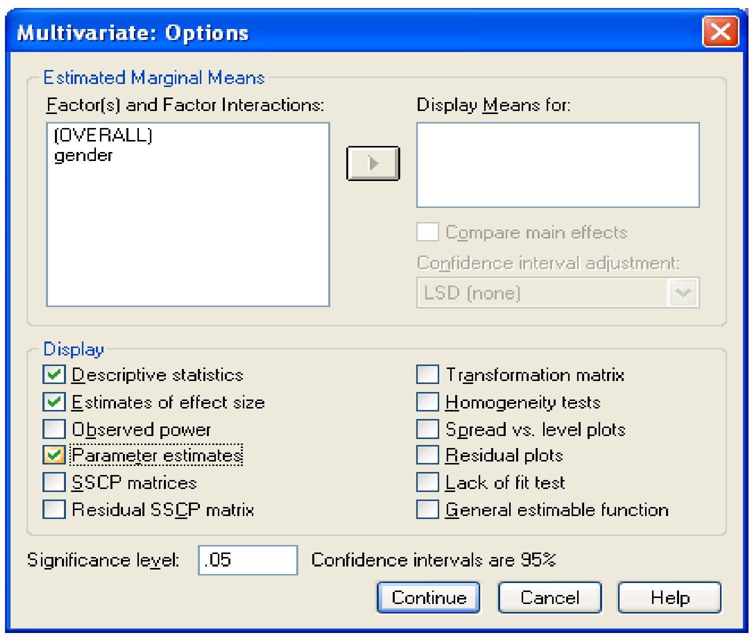
- Click on **Analyze => General Linear Model => Multivariate**



- Multivariate dialog box will appear, select **food cost** variable and **lifestyle** variable and move into Dependent Variable
- Move **Gender** variable into Fix Factor(s)



- Click **option** and then select Descriptive statistics, Estimates of effect size, and Parameter estimates



- Click **Continue**
- Click **OK** and output will appear

Output

Between-Subjects Factors

		Value Label	N
gender	0	male	189
	1	female	211

Descriptive Statistics

	gender	Mean	Std. Deviation	N
food cost	male	445.24	82.375	189
	female	451.18	79.947	211
	Total	448.38	81.056	400
lifestyle cost	male	723.54	195.055	189
	female	945.26	209.481	211
	Total	840.50	230.880	400

Multivariate Tests(b)

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.969	6237.900(a)	2.000	397.000	.000	.969
	Wilks' Lambda	.031	6237.900(a)	2.000	397.000	.000	.969
	Hotelling's Trace	31.425	6237.900(a)	2.000	397.000	.000	.969
	Roy's Largest Root	31.425	6237.900(a)	2.000	397.000	.000	.969
gender	Pillai's Trace	.308	88.173(a)	2.000	397.000	.000	.308
	Wilks' Lambda	.692	88.173(a)	2.000	397.000	.000	.308
	Hotelling's Trace	.444	88.173(a)	2.000	397.000	.000	.308
	Roy's Largest Root	.444	88.173(a)	2.000	397.000	.000	.308

a Exact statistic
b Design: Intercept+gender

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	food cost	3525.673(a)	1	3525.673	.536	.465	.001
	lifestyle cost	4900914.469(b)	1	4900914.469	119.169	.000	.230
Intercept	food cost	80114325.673	1	80114325.673	12179.717	.000	.968
	lifestyle cost	277648789.469	1	277648789.469	6751.241	.000	.944
gender	food cost	3525.673	1	3525.673	.536	.465	.001
	lifestyle cost	4900914.469	1	4900914.469	119.169	.000	.230
Error	food cost	2617918.077	398	6577.684			

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
	lifestyle cost	16367985.531	398	41125.592			
Total	food cost	83037500.000	400				
	lifestyle cost	303845000.000	400				
Corrected Total	food cost	2621443.750	399				
	lifestyle cost	21268900.000	399				

a R Squared = .001 (Adjusted R Squared = -.001)
b R Squared = .230 (Adjusted R Squared = .228)

Parameter Estimates

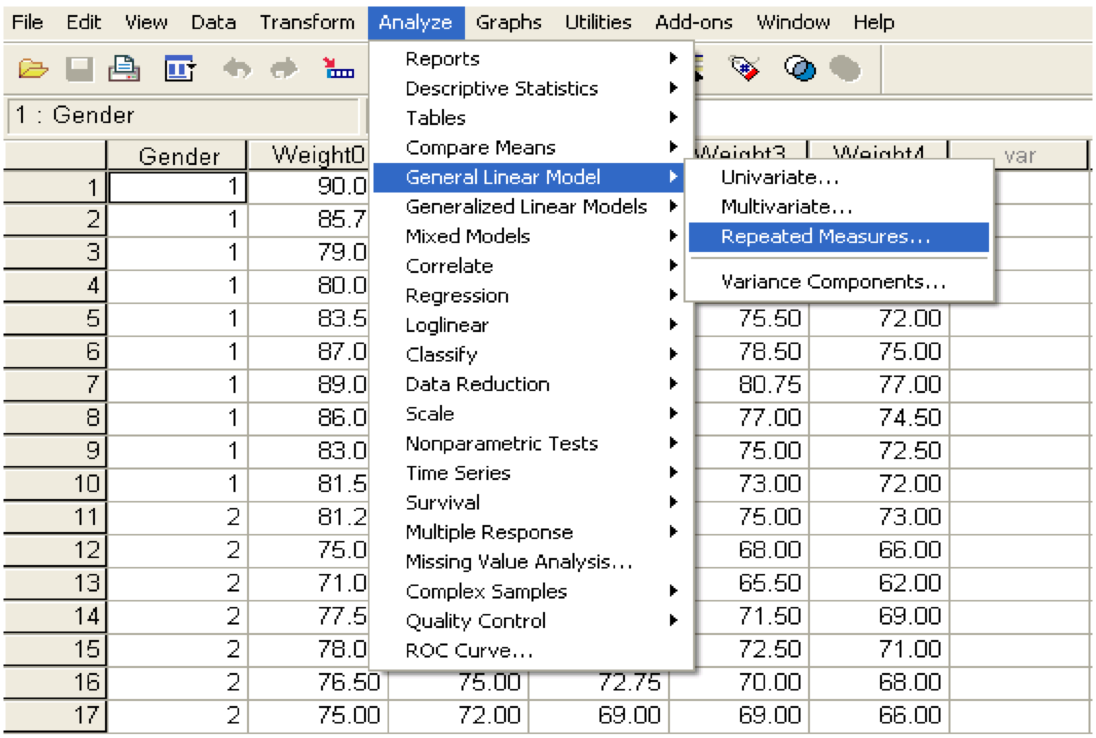
Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
food cost	Intercept	451.185	5.583	80.809	.000	440.208	462.161	.943
	[gender=0]	-5.947	8.123	-.732	.465	-21.915	10.022	.001
	[gender=1]	0(a)	.	.	.	.	.	.
lifestyle cost	Intercept	945.261	13.961	67.707	.000	917.814	972.707	.920
	[gender=0]	-221.716	20.310	-10.916	.000	-261.644	-181.787	.230
	[gender=1]	0(a)	.	.	.	.	.	.

a This parameter is set to zero because it is redundant.

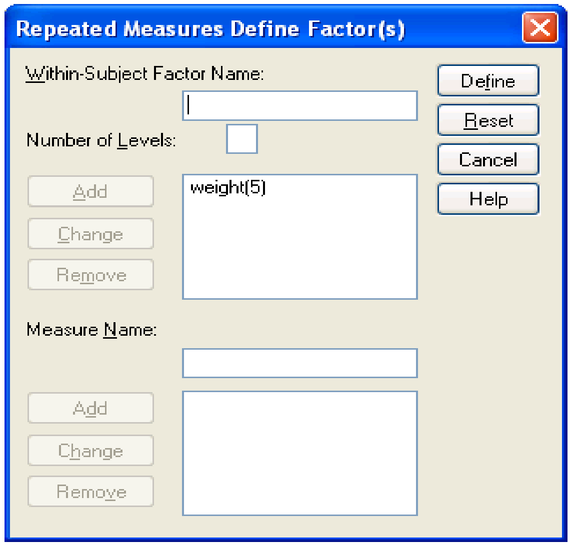
GLM Repeated Measures

Example case for this section is research about performance of 4 weeks diet program between male and female.

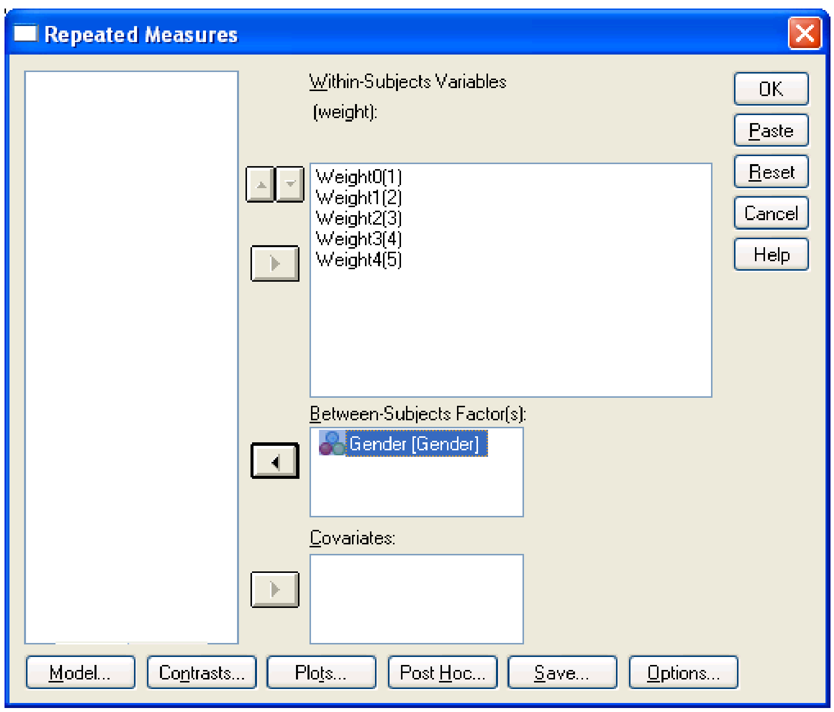
- Click on **Analyze => General Linear Model => Repeated Measures**



- Repeated Measures Define dialog will appear, write **weight** in the Within-Subject Factor Name and enter **5** on Number of Levels. Click **Add** and weight5 will move into box



- Click **Define** and Repeated Measures dialog will appear. Enter dependent variable from **weight0, weight1, weight2, weight3** and **weight4** in Within-Subjects Variables (weight) and **gender** variable in Between-Subjects Factor(s) box.



- Click **Option**, select Descriptive statistics, Estimates of effect size, and Parameter estimates
- Click **Continue**
- Click **OK**, and Output will appears

Output

Within-Subjects Factors

Measure: MEASURE_1

weight	Dependent Variable
1	Weight0
2	Weight1
3	Weight2
4	Weight3
5	Weight4

Between-Subjects Factors

		Value Label	N
Gender	1	male	10
	2	female	10

Descriptive Statistics

	Gender	Mean	Std. Deviation	N
Weight before program	male	84.4750	3.70144	10
	female	75.5000	3.12027	10
	Total	79.9875	5.68324	20
Weight Weeks1	male	82.0500	3.37021	10
	female	73.5000	3.30824	10
	Total	77.7750	5.45912	20
Weight Weeks2	male	78.9250	3.21898	10
	female	71.4250	3.26609	10
	Total	75.1750	4.97633	20
Weight Weeks3	male	77.0250	4.77617	10
	female	70.4000	4.03320	10
	Total	73.7125	5.48279	20
Weight Weeks4	male	74.5000	4.99444	10
	female	68.1250	4.21843	10
	Total	71.3125	5.56237	20

Multivariate Tests(b)

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
weight	Pillai's Trace	.981	193.405(a)	4.000	15.000	.000	.981
	Wilks' Lambda	.019	193.405(a)	4.000	15.000	.000	.981
	Hotelling's Trace	51.575	193.405(a)	4.000	15.000	.000	.981
	Roy's Largest Root	51.575	193.405(a)	4.000	15.000	.000	.981

weight * Gender	Pillai's Trace	.569	4.960(a)	4.000	15.000	.009	.569
	Wilks' Lambda	.431	4.960(a)	4.000	15.000	.009	.569
	Hotelling's Trace	1.323	4.960(a)	4.000	15.000	.009	.569
	Roy's Largest Root	1.323	4.960(a)	4.000	15.000	.009	.569

a Exact statistic
b Design: Intercept+Gender
Within Subjects Design: weight

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
weight	Sphericity Assumed	922.129	4	230.532	73.811	.000	.804
	Greenhouse-Geisser	922.129	1.118	824.571	73.811	.000	.804
	Huynh-Feldt	922.129	1.206	764.356	73.811	.000	.804
	Lower-bound	922.129	1.000	922.129	73.811	.000	.804
weight * Gender	Sphericity Assumed	26.271	4	6.568	2.103	.089	.105
	Greenhouse-Geisser	26.271	1.118	23.492	2.103	.162	.105
	Huynh-Feldt	26.271	1.206	21.776	2.103	.159	.105
	Lower-bound	26.271	1.000	26.271	2.103	.164	.105
Error(weight)	Sphericity Assumed	224.875	72	3.123			
	Greenhouse-Geisser	224.875	20.130	11.171			
	Huynh-Feldt	224.875	21.715	10.356			
	Lower-bound	224.875	18.000	12.493			

Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	571422.606	1	571422.606	9246.269	.000	.998
Gender	1445.901	1	1445.901	23.396	.000	.565
Error	1112.406	18	61.800			

5. Recoding Data

You can recode data into either the same variable or into a new one by going to **Transform** > **Recode.** This tool is especially useful for creating dummy variables, changing values from letters to numbers, increasing or decreasing the number of possible values, or for creating specialized filters that let you have fine-tuned control over which cases to exclude.

SPSS allows us to recode variables and then use the recoded variables in statistical analyses.

The values in variables **FAED** (father's education) and **MAED** (mother's education) range from 2 to 10 indicating 9 levels of education as:

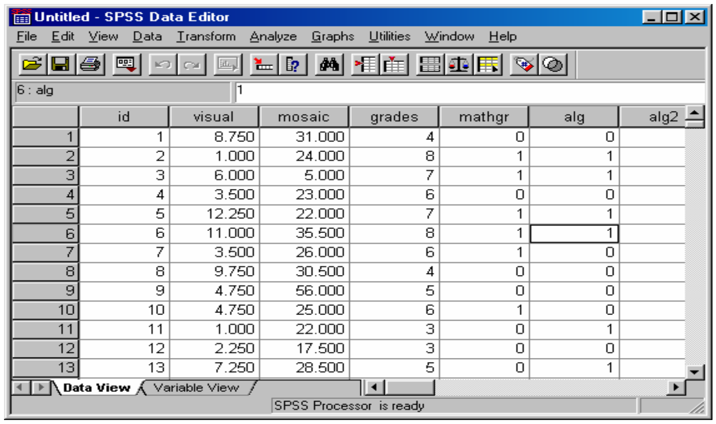
FAED/MAED	**Labeled**
2	Less than high school
3	High school graduate
4	Less than 2 years' vocational education
5	More than 2 years' vocational education
6	Less than 2 years' college education
7	More than 2 years' college education
8	College graduate
9	Master's degree
10	MD/PhD degree

Now we want to regroup (recode) the nine levels into four levels as:

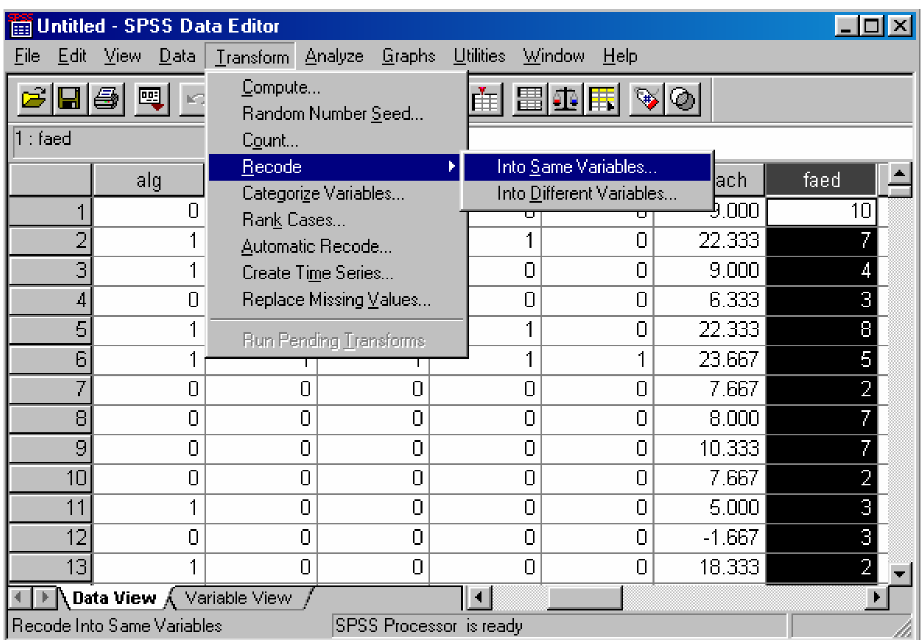
FAED/MAED	**FAEDNEW / MAEDNEW**	**Labeled**
2	1	Less than high school
3	2	High school graduate
4,5,6,7	3	Some post-secondary education
8,9,10	4	College graduate & beyond

To recode the variables, please follow the steps:

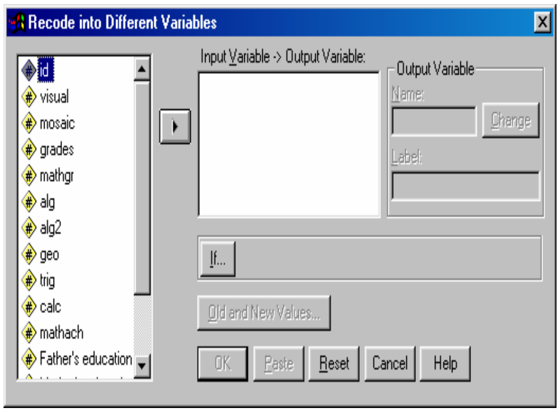
- You will see the data in the SPSS Data Editor window:

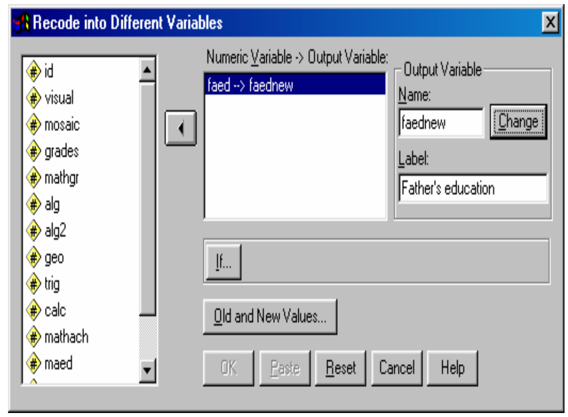


- Before you recode the data, you should make a copy of original data. Make sure you save the new file into the same place as the original file.
- Recode the **FAED** (father's education) variable into a new variable
- From **Transform** menu, choose **Recode**, then **Into Different Variable**.

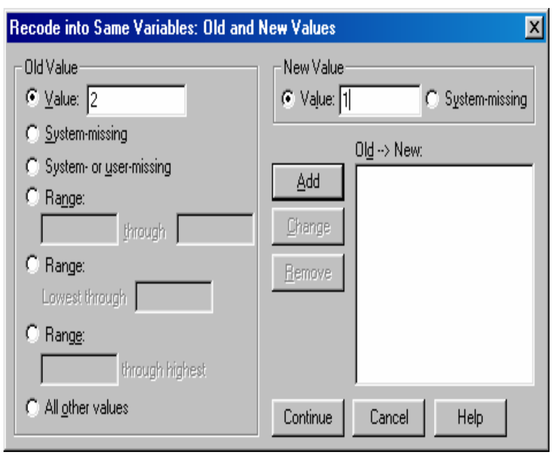


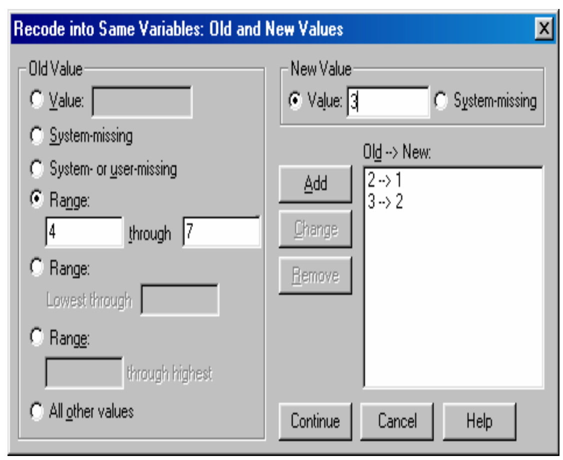
- In the "Recode into Different Variable" dialogue box, you will see a list of variables in the box on the left. Click on "**faed**", and then click on the arrow button. You will see "**faed**" appears in the right box.



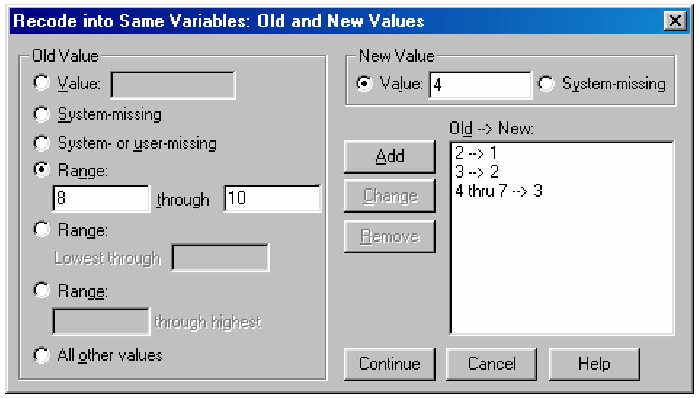


- Type "**faednew**" in the Output/Variable-Name box as the name of the new variable. Type "Father's education" as the label for the new variable. Click on the **Change** button (see above).
- Click on the button "**Old and New Values**", you will see the Old and New Values dialogue box. Under Old Value section, type 2 in the Value box, and type 1 into the Value box under New Value section – this will recode the old value 2 into a new value 1 (as shown in the tables at the beginning of this module). Click on **Add** button.

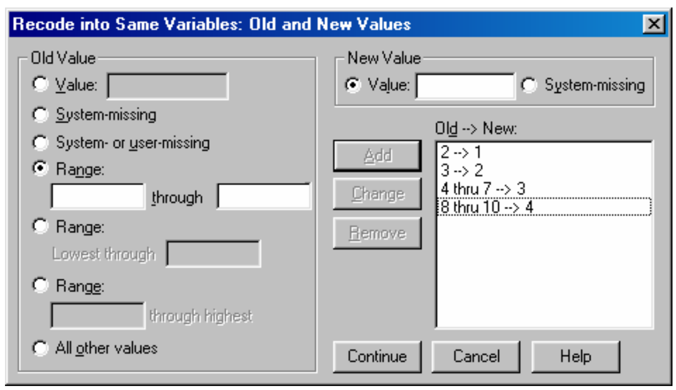




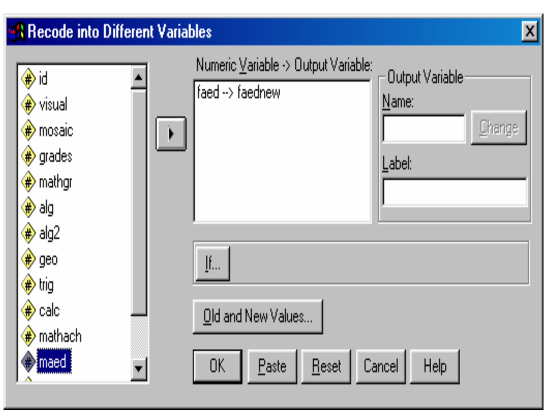
- Type 3 in Old value box, and 2 in New value box. Click on **Add** button. The recoding shows in the Old → New box.
- Check the **Range** radio button, then type 4 in the first box, and type 7 in the box after the word "through". Then type 3 in the New value box. Click on **Add** button. You will see:

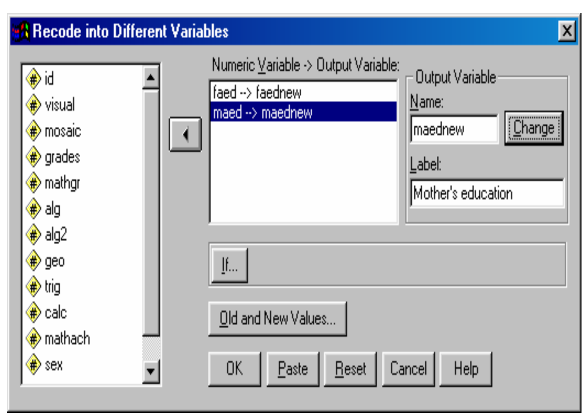


- Type 8 and 10 in the range boxes, and 4 in the New value box. Click on **Add**, you have recoded the nine old values into four new values:

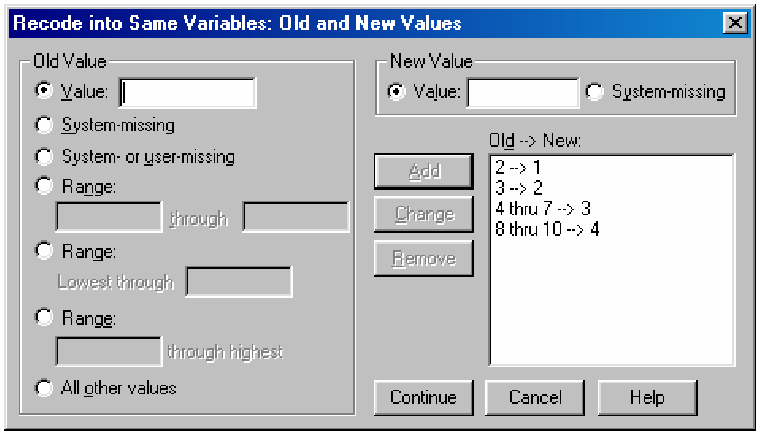


- Click on Continue button, you will be back to the Recode into Different Variable dialogue box. Now you will recode another variable **maed**—mother's education.
- Recode the **MAED** (mother's education) variable
- In the Recode into Different Variable box, from the variable list, click on **maed**, and click on the arrow button to add the variable **maed** into the right box, it should be under **faed** variable.

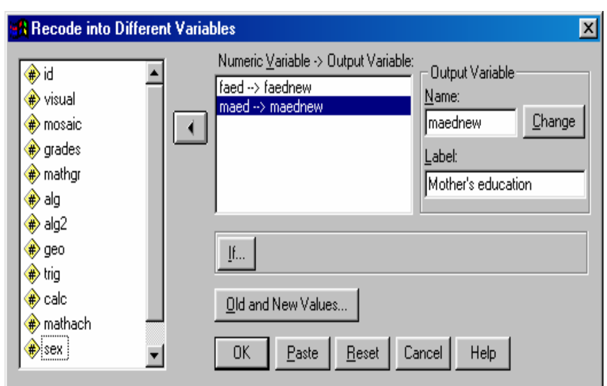


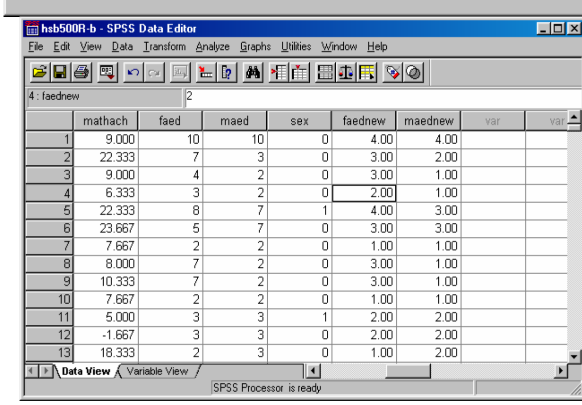


- Make sure the variable **maed** is highlighted, type **maednew** in the Output/Variable-Name box as the name of the new variable. Type “Mother’s education” as the label for the new variable. Click on the **Change** button (see above).
- Click on **Old and New Values** button, you will see the previous recode settings:

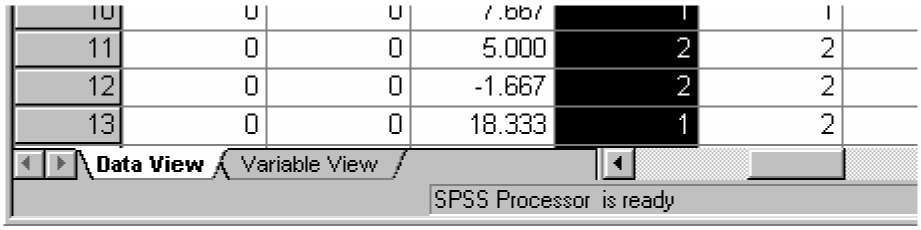


- We will use the same recode settings. So we do not need to change. Simply click on Continue. (If you need to change the settings, click on each of the recode settings, then click on Remove. You can add new transform settings).
- Now, you are back to the original dialogue box, click on **OK**. You will see the two new variables **faednew** and **maednew**.

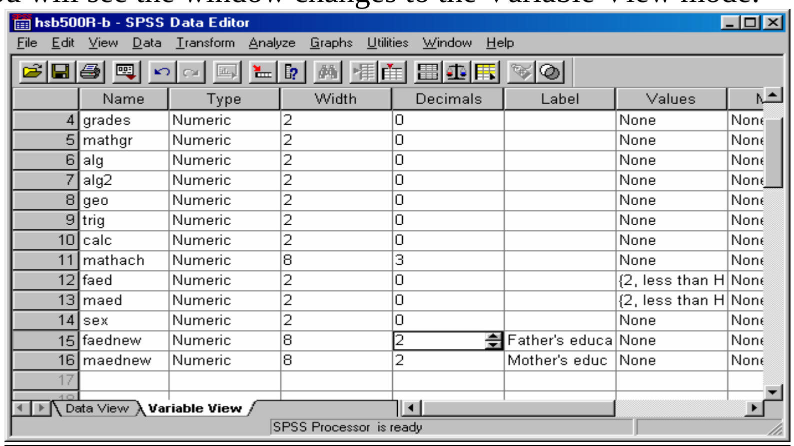




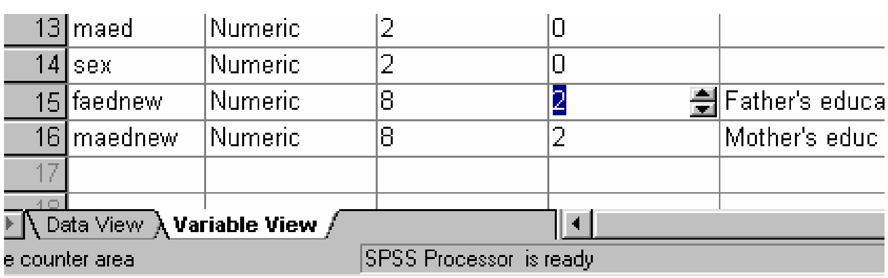
- For the value of these two variables, we do not need decimals. To change the decimals, look at the bottom of the Data Editor window, you can see two tabs (Data View – which is the current window, and **Variable View**). Click on the **Variable View** tab.



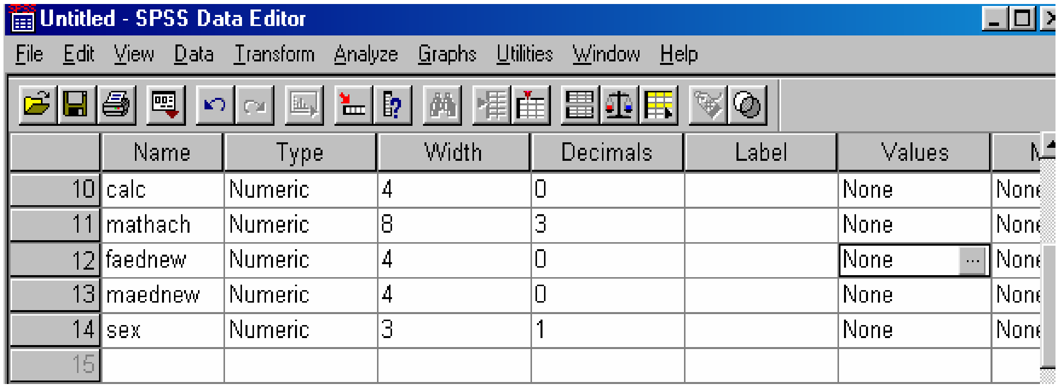
- You will see the window changes to the Variable View mode:



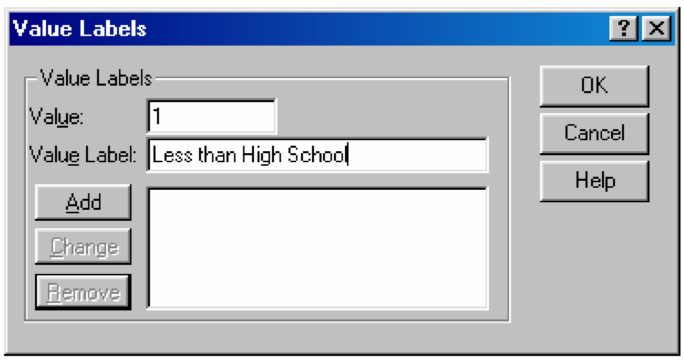
- Click on the decimal cell of the **faednew** variable, the two arrows appear for you to change the decimals. Click on the down arrow to change the decimal number to 0. Repeat this step to change the decimals for the **maednew** variable.



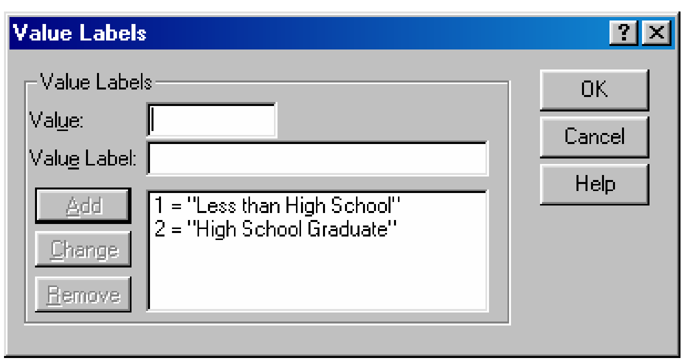
- Save the changes, to save the changes, from File menu, choose Save to save.
- Label the new values, click in the cell that crossing the **Values** column and the 12th row (**faednew** variable), you will see a small gray box.



- Double click on the small gray box, you will see the Value Labels dialogue box as the following. Type 1 in the Value box, and “Less than High School” in the Value Label box. Then click on **Add** button.



- Type 2 in Value box, and “High School Graduate” in the Value Label box. Click on **Add**. You should have:



- Repeat Step above. Make the value label “Some Post-Secondary Education” for 3, and “College Graduate & Beyond” for 4. Then click on **OK**. You should see:

	Name	Type	Width	Decimals	Label	Values
10	calc	Numeric	4	0		None
11	mathach	Numeric	8	3		None
12	faednew	Numeric	4	0		{1, Less th
13	maednew	Numeric	4	0		None
14	sex	Numeric	3	1		None
15						

- Repeat Step above to change the value labels for the variable **maednew**.You can repeat to add value labels to each variable.

- We can add the labels for the variables with a clear description of the variable when sometimes the meaning is not clear from the variable name itself (e.g., "mathach" we can add a label "Math Achievement" as the label). To do this:
- In the Variable View window, click in the Label column of the **mathach** variable, and type "Math Achievement" in the crossing cell.

8	geo	Numeric	2	0		None
9	trig	Numeric	2	0		None
10	calc	Numeric	2	0		None
11	mathach	Numeric	8	3	Math Achievement	None
12	faed	Numeric	2	0		{2, les
13	maed	Numeric	2	0		{2, les

- You can repeat Step above to add variable label to each variable.

- Save the changes. Make sure you save the data as SPSS (*.sav) file. Click on the Data View tab to switch to the data. Now, you are ready to use this new set of data with recoded values in **faednew** and **maednew** variable.

Recoding Data With Syntax

It is possible to use syntax when recoding variables. For example, if I had a variable that included the following values:

Redbird
Bluebird

Yellowbird
Elm
Butterfly

and I wanted to recode any values that included 'bird' into a new value 'bird'.

To solve to problem the following syntax is an option:

```
DATA LIST LIST /var1(A15).
BEGIN DATA
Bluebird
Redbird
Yellowbird
Butterfly
Elm
END DATA.
```

```
STRING newVar(A15).
DO IF INDEX(UPCASE(var1),â€   BIRDâ€   ) > 0 .
- COMPUTE newVar=â€   BIRDâ€   .
END IF.
EXECUTE.
```

Example number two is we want to recode the above variables into variables having the same name but with the last letter being replaced by x.

```
DATA LIST FREE /abc, sal, age, sex1, school,v1234567.
BEGIN DATA
85 95 5 87 100 1
END DATA.
LIST.
SAVE OUTFILE='c:\temp\mydata.sav'.
* suppose we want to recode the above variables into variables having the same name but
with the last letter being replaced by x.

FLIP.
STRING newname(A8).
COMPUTE newname=CONCAT(SUBSTR(case_lbl,1,LENGTH(RTRIM(case_lbl))-
1),"X").
WRITE OUTFILE 'c:\temp\temp.sps'
  /"RECODE "case_lbl" (1 THRU 87.9=1) (89 THRU 98.1=1) (ELSE=COPY) INTO
"newname"."/"FREQ "newname".".
EXE.
```

```
GET FILE='c:\temp\mydata.sav'.
INCLUDE 'c:\temp\temp.sps'.
```