**CORRELATION**

**PURPOSE:**

A correlation is a single number that describes the direction and the degree of relationship between two variables.

**ASSUMPTION:**

### The variables must be normally distributed.

### The variables must be linear.

**HYPOTHESIS:**

Null hypothesis Ho: there is no significant relationship between the variables.

Alternate hypothesis H1: there is a significant relationship between the variables.

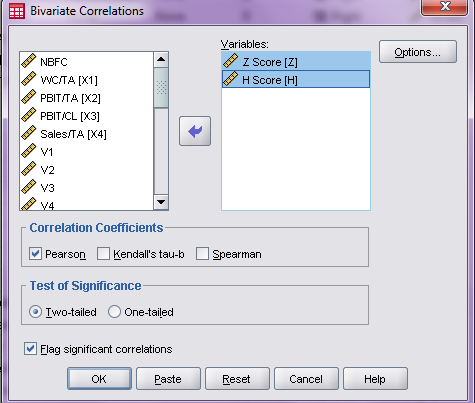
**PROCEDURE:**

STEP1: Open the database, say Narayanan.

STEP2: To run the correlation analysis:

Analyze------->correlate------------> Bivariate

STEP3: The Bivariate correlation dialog box appears



STEP: 4 select the Z Score (Z), H Score (H) as variables

STEP: 5 select Pearson correlation coefficients.

STEP: 6 click ok,

| **Correlations** | | | |
| --- | --- | --- | --- |
|  |  | Z Score | H Score |
| Z Score | Pearson Correlation | 1 | .811\*\* |
| Sig. (2-tailed) |  | .000 |
| N | 124 | 124 |
| H Score | Pearson Correlation | .811\*\* | 1 |
| Sig. (2-tailed) | .000 |  |
| N | 124 | 124 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | | |

The correlation between Z Score and H Score is r = 0.811 and significant values is 0.000. This indicates that Z Score and H Score are not independent to each other. Here the value of r is 0.811 so it is considered to be a strong correlation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Correlations** | | | |
|  | | sales | mpg |
| sales | Pearson Correlation | 1 | -.017 |
| Sig. (2-tailed) |  | .837 |
| N | 157 | 154 |
| mpg | Pearson Correlation | -.017 | 1 |
| Sig. (2-tailed) | .837 |  |
| N | 154 | 154 |

The significant value is 0.837 which is greater than 0.05 which means the null hypothesis is accepted. This means that there is no relationship between sales and mileage given by vehicles.

|  |  |  |  |
| --- | --- | --- | --- |
| **Correlations** | | | |
|  | | sales | mpg |
| sales | Pearson Correlation | 1 | -.017 |
| Sig. (1-tailed) |  | .419 |
| N | 157 | 154 |
| mpg | Pearson Correlation | -.017 | 1 |
| Sig. (1-tailed) | .419 |  |
| N | 154 | 154 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Correlations** | | | |
|  | | Z | H |
| Z | Pearson Correlation | 1 | .811\*\* |
| Sig. (2-tailed) |  | .000 |
| N | 124 | 124 |
| H | Pearson Correlation | .811\*\* | 1 |
| Sig. (2-tailed) | .000 |  |
| N | 124 | 124 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | | |

R value is 0.811. As the correlation value is 0.811 the relationship is positive.

|  |  |  |  |
| --- | --- | --- | --- |
| **Correlations** | | | |
|  | | Z | H |
| Z | Pearson Correlation | 1 | .811\*\* |
| Sig. (1-tailed) |  | .000 |
| N | 124 | 124 |
| H | Pearson Correlation | .811\*\* | 1 |
| Sig. (1-tailed) | .000 |  |
| N | 124 | 124 |
| \*\*. Correlation is significant at the 0.01 level (1-tailed). | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Correlations** | | | | |
|  | | GOLD | GDP | GDP\_S |
| GOLD | Pearson Correlation | 1 | .959\*\* | .639\* |
| Sig. (2-tailed) |  | .000 | .025 |
| N | 12 | 12 | 12 |
| GDP | Pearson Correlation | .959\*\* | 1 | .766\*\* |
| Sig. (2-tailed) | .000 |  | .004 |
| N | 12 | 12 | 12 |
| GDP\_S | Pearson Correlation | .639\* | .766\*\* | 1 |
| Sig. (2-tailed) | .025 | .004 |  |
| N | 12 | 12 | 12 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | | | |
| \*. Correlation is significant at the 0.05 level (2-tailed). | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Correlations** | | | | |
|  | | | F1 | F2 |
| Kendall's tau\_b | F1 | Correlation Coefficient | 1.000 | .027 |
| Sig. (2-tailed) | . | .488 |
| N | 410 | 410 |
| F2 | Correlation Coefficient | .027 | 1.000 |
| Sig. (2-tailed) | .488 | . |
| N | 410 | 410 |
| Spearman's rho | F1 | Correlation Coefficient | 1.000 | .040 |
| Sig. (2-tailed) | . | .414 |
| N | 410 | 410 |
| F2 | Correlation Coefficient | .040 | 1.000 |
| Sig. (2-tailed) | .414 | . |
| N | 410 | 410 |

**PARTIAL CORRELATION**

**PURPOSE:**

Partial Correlation is the measure of association between two variables, while controlling or adjusting the effect of one or more additional variables. Partial Correlation can be used in many cases, like whether or not the sale value of a particular commodity is strongly related to the expenditure on advertising when the effect of price is controlled. If the partial correlation becomes zero, then it can be inferred that the correlation that was computed before is false.

| **Correlations** | | | |
| --- | --- | --- | --- |
|  |  | Age in years | Income after the program |
| Age in years | Pearson Correlation | 1 | .297\*\* |
| Sig. (2-tailed) |  | .000 |
| N | 1000 | 1000 |
| Income after the program | Pearson Correlation | .297\*\* | 1 |
| Sig. (2-tailed) | .000 |  |
| N | 1000 | 1000 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | |  |

| **Correlations** | | | | |
| --- | --- | --- | --- | --- |
|  |  | Age in years | Income after the program | Income before the program |
| Age in years | Pearson Correlation | 1 | .297\*\* | .526\*\* |
| Sig. (2-tailed) |  | .000 | .000 |
| Income after the program | Pearson Correlation | .297\*\* | 1 | .589\*\* |
| Sig. (2-tailed) | .000 |  | .000 |
| Income before the program | Pearson Correlation | .526\*\* | .589\*\* | 1 |
| Sig. (2-tailed) | .000 | .000 |  |
| N | 1000 | 1000 | 1000 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | |  |  |

**PROCEDURE:**

STEP1: Open the database, say PARTIAL CORRELATION

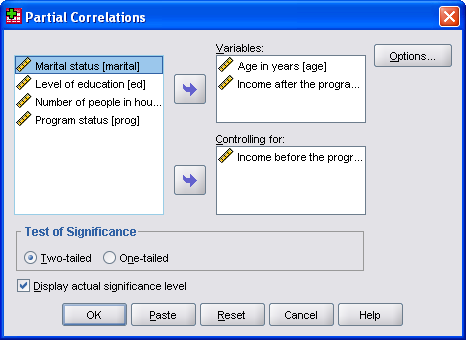
STEP2: To conduct the partial correlation;

Analyze----->Correlate---->Partial

STEP3: Select the variables age and income after the program under variables.

STEP4: Select income before the program as the variable whose effect is to be controlled.

STEP5: Click OK.

******

| Correlations | | | | |
| --- | --- | --- | --- | --- |
| Control Variables | | | Age in years | Income after the program |
| Income before the program | Age in years | Correlation | 1.000 | -.019 |
| Significance (2-tailed) | . | .551 |
| Df | 0 | 997 |
| Income after the program | Correlation | -.019 | 1.000 |
| Significance (2-tailed) | .551 | . |
| Df | 997 | 0 |

The relationship between the age and income after the program, controlling for the income before the program is done using the partial correlation and the correlation value is -0.019 and level of significant value is 0.551 which is greater than 0.05 so there is no significant relationship between age and income after the program.

| **Correlations** | | | | |
| --- | --- | --- | --- | --- |
|  |  | GOLD PRICE | GDP in Billions | Savings in % of GDP |
| GOLD PRICE | Pearson Correlation | 1 | .959\*\* | .639\* |
| Sig. (2-tailed) |  | .000 | .025 |
| N | 12 | 12 | 12 |
| GDP in Billions | Pearson Correlation | .959\*\* | 1 | .766\*\* |
| Sig. (2-tailed) | .000 |  | .004 |
| N | 12 | 12 | 12 |
| Savings in % of GDP | Pearson Correlation | .639\* | .766\*\* | 1 |
| Sig. (2-tailed) | .025 | .004 |  |
| N | 12 | 12 | 12 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | |  |  |
| \*. Correlation is significant at the 0.05 level (2-tailed). | | |  |  |

| **Correlations** | | | | |
| --- | --- | --- | --- | --- |
| Control Variables | | | GOLD PRICE | Savings in % of GDP |
| GDP in Billions | GOLD PRICE | Correlation | 1.000 | -.519 |
| Significance (2-tailed) | . | .102 |
| Df | 0 | 9 |
| Savings in % of GDP | Correlation | -.519 | 1.000 |
| Significance (2-tailed) | .102 | . |
| Df | 9 | 0 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Correlations** | | | | |
|  | | GOLD | GDP | GDP\_S |
| GOLD | Pearson Correlation | 1 | .959\*\* | .639\* |
| Sig. (2-tailed) |  | .000 | .025 |
| N | 12 | 12 | 12 |
| GDP | Pearson Correlation | .959\*\* | 1 | .766\*\* |
| Sig. (2-tailed) | .000 |  | .004 |
| N | 12 | 12 | 12 |
| GDP\_S | Pearson Correlation | .639\* | .766\*\* | 1 |
| Sig. (2-tailed) | .025 | .004 |  |
| N | 12 | 12 | 12 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | | | |
| \*. Correlation is significant at the 0.05 level (2-tailed). | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Correlations** | | | | |
| Control Variables | | | GOLD | GDP\_S |
| GDP | GOLD | Correlation | 1.000 | -.519 |
| Significance (2-tailed) | . | .102 |
| df | 0 | 9 |
| GDP\_S | Correlation | -.519 | 1.000 |
| Significance (2-tailed) | .102 | . |
| df | 9 | 0 |