## PRACTICE THREE: ANALYSIS TOOLPAK ON MICROSOFT EXCEL (II)

1. Generate a problem and corresponding data
2. Give a step by step procedure to obtain the pair-wise covariance and correlation of the variables with analysis toolpak of Microsoft excel.
3. Run the analysis and give the output
4. Give a step by step procedure for (i) simple and (ii) multiple regression analyses with analysis toolpak of Microsoft Excel
5. Run the analysis above, give the outputs and spell out the regression models from the output.

SOLUTION

Using Microsoft Excel Analysis Toolpak

|  |  |  |
| --- | --- | --- |
| Student | Weight of Female student | Weight of Male student |
| 1 | 65.8 | 67.98 |
| 2 | 56.9 | 78.09 |
| 3 | 55.9 | 66.98 |
| 4 | 78.77 | 77.01 |
| 5 | 56.09 | 65.97 |
| 6 | 65.9 | 36.98 |
| 7 | 77.08 | 45.78 |
| 8 | 80.09 | 54.03 |
| 9 | 66.67 | 67.81 |
| 10 | 45.8 | 79.09 |
| 11 | 67.54 | 64.34 |
| 12 | 59.95 | 61.09 |
|  |  |  |

After inputting your data into Microsoft excel, then you follow the following step in doing the analysis

For The Correlation Analysis

* From the menus, select

Data > Data Analysis > Correlation

* Click OK
* It then brings you a dialog box where you click on the red tab in the input range to input the range of data you are analyzing
* Then click select Column and also select the Labels in the first row box. Then click on the red tab in the output range box to select where you want the solution to the analysis appear on the Microsoft excel spreadsheet.
* Click OK.

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Student* | *Weight of Female student* | *Weight of Male student* |
| Student | 1 |  |  |
| Weight of Female student | -0.02009 | 1 |  |
| Weight of Male student | -0.18466 | -0.43542 | 1 |

For The Covariance Analysis

* From the menus, select

Data > Data Analysis > Covariance

* Click OK
* It then brings you a dialog box where you click on the red tab in the input range to input the range of data you are analyzing
* Then click select Column and also select the Labels in the first row box. Then click on the red tab in the output range box to select where you want the solution to the analysis appear on the Microsoft excel spreadsheet.
* Click OK.

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Student* | *Weight of Female student* | *Weight of Male student* |
| Student | 11.91667 |  |  |
| Weight of Female student | -0.69208 | 99.57182 |  |
| Weight of Male student | -7.82458 | -53.3309 | 150.6642 |

Simple Regression Analysis

* From the menus

Data > Data Analysis > Regression

* From the dialog box input the Y-axis input range and also the X-axis input range too
* Select Labels and Residuals in the Residuals option box
* Click on the output range to select where you want the analysis result to surface
* Click OK.

|  |  |
| --- | --- |
| SUMMARY OUTPUT | |
|  |  |
| *Regression Statistics* | |
| Multiple R | 0.435417 |
| R Square | 0.189588 |
| Adjusted R Square | 0.108547 |
| Standard Error | 12.10455 |
| Observations | 12 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 342.7698 | 342.7698 | 2.34 | 0.157133346 |  |  |  |
| Residual | 10 | 1465.201 | 146.5201 |  |  |  |  |  |
| Total | 11 | 1807.971 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 98.41998 | 22.92703 | 4.292748 | 0 | 47.33537188 | 149.504598 | 47.33537188 | 149.5046 |
| Weight of Female student | -0.5356 | 0.350179 | -1.52951 | 0.16 | -1.315849072 | 0.2446445 | -1.315849072 | 0.244644 |

|  |  |  |
| --- | --- | --- |
| RESIDUAL OUTPUT | |  |
|  |  |  |
| *Observation* | *Predicted Weight of Male student* | *Residuals* |
| 1 | 63.17735 | 4.802645 |
| 2 | 67.94421 | 10.14579 |
| 3 | 68.47982 | -1.49982 |
| 4 | 56.23059 | 20.77941 |
| 5 | 68.37805 | -2.40805 |
| 6 | 63.12379 | -26.1438 |
| 7 | 57.13576 | -11.3558 |
| 8 | 55.5236 | -1.4936 |
| 9 | 62.71138 | 5.098619 |
| 10 | 73.8894 | 5.2006 |
| 11 | 62.24541 | 2.094593 |
| 12 | 66.31063 | -5.22063 |

Multiple Regression Analysis

* From the menus

Data > Data Analysis > Regression

* From the dialog box input the Y-axis input range and also the X-axis input range too
* Select Labels and Residuals in the Residuals option box
* Click on the output range to select where you want the analysis result to surface
* Click OK.

|  |  |
| --- | --- |
| SUMMARY OUTPUT | |
|  |  |
| *Regression Statistics* | |
| Multiple R | 0.215784 |
| R Square | 0.046563 |
| Adjusted R Square | -0.16531 |
| Standard Error | 3.89218 |
| Observations | 12 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 2 | 6.658445 | 3.329222 | 0.22 | 0.806891108 |
| Residual | 9 | 136.3416 | 15.14906 |  |  |
| Total | 11 | 143 |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 13.55563 | 12.42977 | 1.090578 | 0.3 | -14.56245136 | 41.67371307 | -14.56245136 | 41.67371 |
| Weight of Female student | -0.0429 | 0.125078 | -0.34298 | 0.74 | -0.325846041 | 0.240046408 | -0.325846041 | 0.240046 |
| Weight of Male student | -0.06712 | 0.101682 | -0.66009 | 0.53 | -0.297140021 | 0.162901528 | -0.297140021 | 0.162902 |