APPLIED MANAGEMENT STATISTICS

by Student’s Name

Class/Course/Code

Professor’s Name

University/School

City, State

Date

a

Applied Management Statistics

Table 1 Showing hours of the week and grade for both males and females

|  |  |  |  |
| --- | --- | --- | --- |
| **Male** | | **Female** | |
| **Hours of the Week** | **Grade** | **Hours of the Week** | **Grade** |
| 7 | 82 | 10 | 85 |
| 6 | 80 | 12 | 91 |
| 5 | 76 | 7 | 79 |
| 6 | 75 | 10 | 88 |
| 8 | 82 | 10 | 86 |
| 9 | 86 | 12 | 93 |
| 7 | 84 | 8 | 81 |
| 5 | 77 | 13 | 90 |
| 8 | 80 | 9 | 84 |
| 9 | 82 | 7 | 78 |

1. The most appropriate hypothesis test is that if boys and girls study the same time, then they will get the same results.
2. Alternative hypothesis: If boys and boys study the same time, then they will get the same results

Null hypothesis: If boys and girls study the same time, they will not get the same results (Fitzpatrick and Galbraith, 1981, 45).

1. The p-values for the above variable would be **6.68523E-09** demonstrated in the regression table below, extracted from the attached excel file

Table 2: Showing Regression Results

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.923 |  |  |  |  |  |  |  |
| R Square | 0.852 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.844 |  |  |  |  |  |  |  |
| Standard Error | 1.979 |  |  |  |  |  |  |  |
| Observations | 20 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 406.48 | 406.48 | 103.83 | **6.69E-09** |  |  |  |
| Residual | 18 | 70.47 | 3.92 |  |  |  |  |  |
| Total | 19 | 476.95 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 65.912 | 1.730 | 38.107 | 0.000 | 62.278 | 69.546 | 62.278 | 69.546 |
| Hours of the Week | 2.028 | 0.199 | 10.189 | 0.000 | 1.610 | 2.447 | 1.610 | 2.447 |

The alpha of the study happened to be 0.05. Since, the p value is less than 0.05, then the correlation is statistically significant (Hildebrand, 2012, 65). Meaning, the study accepts the alternative hypothesis and rejects null hypothesis.

**2.**

List of random numbers would be

|  |  |
| --- | --- |
| **Hours of the Week** | **Grade** |
| 5 | 88 |
| 4 | 79 |
| 6 | 87 |
| 8 | 90 |
| 4 | 78 |
| 3 | 88 |

Using the above random samples, the results would be different. The p value happens to be 0.28 which is more than the alpha. Meaning, the study will reject th alternative hypothesis and accept the null hypothesis.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.522233 |  |  |  |  |  |  |  |
| R Square | 0.2727273 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.0909091 |  |  |  |  |  |  |  |
| Standard Error | 4.8989795 |  |  |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 36 | 36 | 1.5 | 0.287864135 |  |  |  |
| Residual | 4 | 96 | 24 |  |  |  |  |  |
| Total | 5 | 132 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 77.5 | 6.4420494 | 12.030333 | 0.000273713 | 59.61400358 | 95.385996 | 59.614004 | 95.385996 |
| Hours of the Week | 1.5 | 1.2247449 | 1.2247449 | 0.287864135 | -1.900436903 | 4.9004369 | -1.9004369 | 4.9004369 |

The new p-value will be 0.2878.

3.

**Population mean for 80% confidence interval**

|  |  |
| --- | --- |
| *Grade* |  |
|  |  |
| **Mean** | **85** |
| Standard Error | 2.0976177 |
| Median | 87.5 |
| Mode | 88 |
| Standard Deviation | 5.138093 |
| Sample Variance | 26.4 |
| Kurtosis | -1.7303719 |
| Skewness | -0.8227318 |
| Range | 12 |
| Minimum | 78 |
| Maximum | 90 |
| Sum | 510 |
| Count | 6 |
| **Confidence Level(80.0%)** | **3.09584** |

**Population mean for 95% confidence interval**

|  |  |
| --- | --- |
| *Grade* |  |
|  |  |
| **Mean** | **85** |
| Standard Error | 2.0976177 |
| Median | 87.5 |
| Mode | 88 |
| Standard Deviation | 5.138093 |
| Sample Variance | 26.4 |
| Kurtosis | -1.7303719 |
| Skewness | -0.8227318 |
| Range | 12 |
| Minimum | 78 |
| Maximum | 90 |
| Sum | 510 |
| Count | 6 |
| **Confidence Level(95.0%)** | **5.392098** |

**Population mean for 99.9% confidence interval**

|  |  |
| --- | --- |
| *Grade* |  |
|  |  |
| Mean | 85 |
| Standard Error | 2.0976177 |
| Median | 87.5 |
| Mode | 88 |
| Standard Deviation | 5.138093 |
| Sample Variance | 26.4 |
| Kurtosis | -1.7303719 |
| Skewness | -0.8227318 |
| Range | 12 |
| Minimum | 78 |
| Maximum | 90 |
| Sum | 510 |
| Count | 6 |
| **Confidence Level(99.9%)** | **14.40817** |

4. Relationship between hours of study and the grad

a)

Figure 1: Showing the Scatter Diagram of the Two Variables

b)

Linear regression equation for the two variable is

Figure 2 Showing Linear Regression

From the above formulae, the independent variable happens to be the hours of the week while the dependent variable is the grade attained (Fitzpatrick and Galbraith, 1981, 56). Meaning, the number of hours an individual takes to read determine the grade the student gets. The higher the number of hours, the higher the grade, also the less the number of hours, the lower the grade.

c)

The coefficient correlation between the two variables happen to be

Table 3 Showing Coefficient Correlation

|  |  |  |
| --- | --- | --- |
|  | ***Hours of the Week*** | ***Grade*** |
| **Hours of the Week** | 1 |  |
| **Grade** | 0.92419496 | 1 |

The coefficient correlation between the two variables is 0.9242. The figure shows that the variable are positively correlated, the higher the number of hours of the week one studies, the higher the grades he attains and vice versa (Hildebrand, 2012, 56).

d)

If a student studies 4.5 hours per week, his grade will be

## References

Fitzpatrick, J. and Galbraith, P., 1981. *Applied mathematics*. 3rd ed. New York: J. Wiley.

Hildebrand, F., 2012. *Methods of Applied Mathematics*. Dover Publications.