**Findings of Alumni Giving Rates**

Student’s Name

Institution Name

Assignment Due Date

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**Introduction**

Just like any other business, universities and colleges want to improve their revenue. One way of improving revenue is by increasing alumni donations. Previous research shows that close contact between instructors and learners is likely to increase the graduation rate. University and college administrations think that having small classes and lower student-faculty is likely to improve the contact between instructors and learners. Accordingly, increased contact between the two will increase the graduation rate hence earning more revenue from alumni donations. This report presents the findings obtained from analyzing the relationship between graduation rate, class size, number of students enrolled, and alumni giving rate.

**Descriptive Analysis**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***Graduation rate*** |  | ***% of Classes Under 20*** |  | ***Student-Faculty Ratio*** |  | ***Alumni Giving Rate*** |  |
|  |  |  |  |  |  |  |  |
| Mean | 83.0416667 | Mean | 55.72917 | Mean | 11.54167 | Mean | 29.27083 |
| Standard Error | 1.24233763 | Standard Error | 1.904348 | Standard Error | 0.700151 | Standard Error | 1.940091 |
| Median | 83.5 | Median | 59.5 | Median | 10.5 | Median | 29 |
| Mode | 92 | Mode | 65 | Mode | 13 | Mode | 13 |
| Standard Deviation | 8.60716756 | Standard Deviation | 13.19371 | Standard Deviation | 4.850788 | Standard Deviation | 13.44135 |
| Sample Variance | 74.0833333 | Sample Variance | 174.074 | Sample Variance | 23.53014 | Sample Variance | 180.6698 |
| Kurtosis | -1.1039055 | Kurtosis | -0.95662 | Kurtosis | -0.44034 | Kurtosis | -0.07194 |
| Skewness | -0.28227861 | Skewness | -0.50061 | Skewness | 0.581838 | Skewness | 0.370107 |
| Range | 31 | Range | 48 | Range | 20 | Range | 60 |
| Minimum | 66 | Minimum | 29 | Minimum | 3 | Minimum | 7 |
| Maximum | 97 | Maximum | 77 | Maximum | 23 | Maximum | 67 |
| Sum | 3986 | Sum | 2675 | Sum | 554 | Sum | 1405 |
| Count | 48 | Count | 48 | Count | 48 | Count | 48 |

The first variable is the graduation rate. The mean graduation rate is 87.04. The median and mode are 83.5 and 92. The standard deviation is 8.6. The maximum and minimum are 97 and 66 respectively. The second variable is the % of Classes Under 20, the mean, median, and mode are 55.73, 59.5, and 65. The standard deviation of this variable is 13.19. The minimum and maximum values are 29 and 77. The third variable is Student-Faculty Ratio, its mean, median, mode, and standard deviation are 11.5, 10.5,13, and 4.8 respectively. The maximum and minimum values of this variable are 23 and 3. The last variable is the alumni giving rate, its mean, mode, and median are 29.2, 13, and 29 respectively. The standard deviation is 13.4. The maximum and minimum values are 67 and 7.

**Simple Linear Regression**

|  |  |
| --- | --- |
| ***Regression Statistics*** | |
| Multiple R | 0.755944 |
| R Square | 0.571451 |
| Adjusted R Square | 0.562134 |
| Standard Error | 8.894328 |
| Observations | 48 |

The multiple R is 0.7559. This value indicates a strong correlation between the graduation rate and alumni giving rate. The R square is 0.5714. This value indicates the proportion of alumni giving rate that can be explained by graduation rate. A proportion of 57. 14 % of alumni giving rate can be explained by graduation rate, the other proportion is influenced by other variables. Based on the findings above graduation rate can be used as a predictor of alumni giving rate.

**Multiple Linear Regression**

|  |  |
| --- | --- |
| ***Regression Statistics*** | |
| Multiple R | 0.836625 |
| R Square | 0.699941 |
| Adjusted R Square | 0.679482 |
| Standard Error | 7.609725 |
| Observations | 48 |

Based on the findings above, the multiple R is 0.836. This value indicates a strong correlation between the predictors and the alumni giving rate. The r-square value is 0.699. This value indicates that 69.9 % of the alumni giving rate can be explained by the three variables namely, graduation rate, percentages of classes with less than 20 students, and faculty ratio. The remaining variation can be accounted for by other variables.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | -20.7201 | 17.52137 | -1.18256 | 0.243333 | -56.0321 | 14.59186 | -56.0321 | 14.59186 |
| Graduation Rate | 0.748183 | 0.16596 | 4.508213 | 4.8E-05 | 0.413712 | 1.082653 | 0.413712 | 1.082653 |
| % of Classes Under 20 | 0.029041 | 0.139321 | 0.208444 | 0.835844 | -0.25174 | 0.309824 | -0.25174 | 0.309824 |
| Student-Faculty Ratio | -1.19201 | 0.386723 | -3.08234 | 0.003538 | -1.9714 | -0.41262 | -1.9714 | -0.41262 |

From the findings above, the graduation rate is a vital variable in predicting the alumni giving rate. For a 1 % increase in graduation rate, the alumni giving rate is set to increase by 0.748. For the second variable, % of classes under 20, an increase in this variable is likely to result in a 0.029 increase in the alumni giving rate. The third variable is student-faculty ratio. The coefficient is -1.192. Decreasing the student-faculty ratio will increase the alumni giving rate by 1.192. Increasing the student-faculty ratio will lower the alumni giving rate by 1.192.

The p-value of the graduation rate is 4.8E-05 which is statically significant. This indicates that this variable can be used as a predictor of alumni giving rate. Student-faculty ratio p-value is 0.0035, which is also statistically significant. This proves that this variable can be relied upon when predicting alumni giving rate. The last variable has a p-value of 0.835, this value is statically insignificant. This indicates that % of Classes Under 20 variables has minimal impact on the alumni giving rate.

**Comparison Between Simple Linear Regression Model and Multiple Regression Model**

Based on the findings of the analysis, the graduation rate alone has an impulse impact on the alumni giving rate. Combining the effect of the graduation rate, % of Classes Under 20, and student-faculty ratio increases the alumni giving rate. However, % of Classes Under 20 is statically insignificant in this model as its impact is very minimal on the alumni giving rate, therefore removing it cannot have an impact on this prediction model.

**Quadratic Form**

|  |  |
| --- | --- |
| ***Regression Statistics*** | |
| Multiple R | 0.866761 |
| R Square | 0.751275 |
| Adjusted R Square | 0.728138 |
| Standard Error | 7.008368 |
| Observations | 48 |

Based on the findings of the quadratic form, it can be evident that the new model obtained is an improvement from the multiple linear regression. The r square is 0.75. This proves that the new quadratic model can explain the variation in alumni giving rate by 75 % an improvement compared to the multiple linear regression.

**Conclusion and Recommendation**

Graduation rate has a significant impact on the alumni giving rate. The student-faculty ratio has minimal impact on the alumni giving rate compared to the graduation rate. % of Classes Under 20 has a very minimal impact on the alumni giving rate and it can be excluded from this prediction model. The administration of higher learning institutions can focus on increasing graduation rates to increase alumni donations. Reducing the student-faculty ratio can also be effective in increasing the alumni giving rate but its impact is not significant as compared to the graduation rate. The last variable % of Classes Under 20, should be excluded from this analysis since it has a very minimal impact on the alumni giving rate. The administration should not focus on this variable.