You will be analyzing the association between two quantitative variables of your choice. You may analyze anything you’d like; your only limit is that both variables must be *quantitative*. Correlations can only be calculated if both variables are quantitative. Therefore, your project will be voided and you will receive a no-score if you use categorical variables. If you are unsure about the appropriateness of your selected variables, please see me before you begin your data collection.

**Preparing the Project** *Complete the following steps by* **October 29th (A) / October 30th (B)**.

**Step 1: Select your variables.**

Select any two *quantitative* variables (e.g., GPA and hours spent studying, average temperature and

precipitation, grams of sugar and calorie count).

*CAUTION*: Some variables (like height) may be influenced by a third variable (like gender). In this

case, limit your variables to the age and height of a specified gender (e.g., age and height of females).

**Step 2: Collect your data.**

Collect data from 20 different individuals. Organize this data into a list or table.

**Completing the Project** *To be completed in class using the applets found at this website:* [*https://www.macmillanlearning.com/studentresources/highschool/statistics/spa3e/analyze\_data/quant2v.html*](https://www.macmillanlearning.com/studentresources/highschool/statistics/spa3e/analyze_data/quant2v.html)

**Step 3: Plot your data in a scatterplot.**

Make sure to label your axes.

**Step 4: Calculate and display the correlation.**

Describe the strength and direction of the correlation (e.g., moderate negative correlation).

In addition, discuss what your correlation indicates about the association between your variables

(i.e., as the value of one variable increases/decreases, what happens to the value of the other variable?).

**Step 5: Draw and label the equation of the least-squares regression line.**

Interpret the slope and y-intercept of your regression line.

Use your regression line to make one prediction (i.e., what would the value of variable y be if x

were this?)

**Step 6: Display the residual plot of the data.**

Use your regression line to calculate and interpret the residual of one value.

What does the residual plot indicate about the appropriateness of a linear model for the data?

**Rubric**

**Variables**

Two quantitative variables have been selected for analysis. 0 5

**Data Collection**

Data is collected from at least 20 different individuals. 1 2 3 4 5

Data points are organized into a legible list or table. 1 2 3 4 5

**Scatterplot**

A scatterplot has been created, including labeled axes. 3 6 9 12 15

**Correlation**

The correlation is calculated and displayed. 2 4 6 8 10

The correlation is described, and its value is discussed

in relation to the variables. 4 8 12 16 20

**Regression Line**

A least-squares regression line is drawn and labeled 1 2 3 4 5

with a slope and y-intercept.

The slope and y-intercept of the regression line are 2 4 6 8 10

identified and interpreted.

One prediction is made using the regression line. 1 2 3 4 5

**Residuals**

One residual is calculated and interpreted using the 2 4 6 8 10

regression line.

A residual plot has been created, including labeled axes. 1 2 3 4 5

The residual plot is interpreted as to whether the linear 1 2 3 4 5

model is an appropriate fit for the data.

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*Comments:* **TOTAL: \_\_\_\_\_\_\_ / 100**