AP Statistics Project 3 Time: 2 days

Name_____

You may work with a partner on this project.

Part 1: Televisions and Life Expectancy (*Complete together, write up do be done by group member 1*)

The following table provides information on life expectancy and number of televisions per thousand people in a sample of 22 countries.

Country	Life Expectancy	Televisions per 1000 People	Country	Life Expectancy	Televisions per 1000 People
Angola	38.45	15	Mexico	75.25	272
Australia	80.45	716	Morocco	70.75	165
Cambodia	59.00	9	Pakistan	63.00	105
Canada	80.15	709	Russia	67.30	421
China	72.40	291	South Africa	43.30	138
Egypt	71.05	170	Sri Lanka	73.25	102
France	79.70	620	Uganda	51.60	28
Haiti	52.95	5	United Kingdom	78.45	661
Iraq	68.75	82	United States	77.80	844
Japan	81.25	719	Vietnam	70.70	184
Madagascar	57.00	23	Yemen	61.80	286

Analyze TV's:

Which countries had the fewest televisions per thousand people?

Which countries had the most televisions per thousand people?

State the stats for the TV's:

Mean: Median: Range: IQR: S_x:

Create a histogram and box plot for TV's:

---

0 1 2 3 4 5 6 7 8 9 10 (hundreds)

Describe the shape:

Analyze Life Expectancy:

Which countries had the lowest life expectancy?

Which countries had the highest life expectancy?

State the stats for life expectancy:

Mean: Median: Range: IQR: S_x:

Create a histogram and box plot for life expectancy:

---

0 10 20 30 40 50 60 70 80 90 100

Describe the shape:

Regression Modeling – Use TV as the explanatory variable and Life expectancy as the response variable.

Find the regression equation:

Interpret the slope in context

Interpret the y-intercept in context

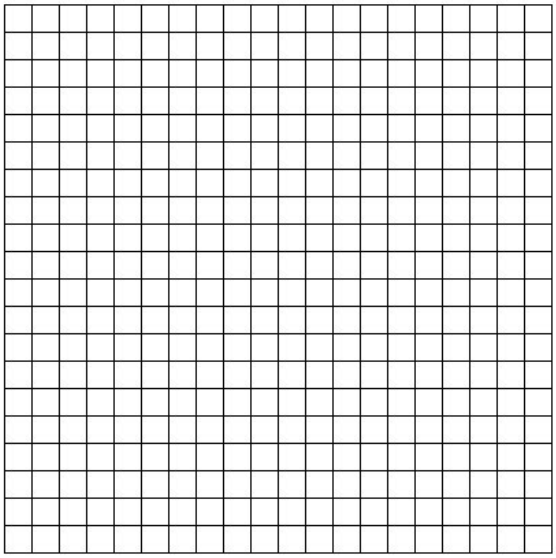
State the correlation, Error of the residuals and Coefficient of Determination

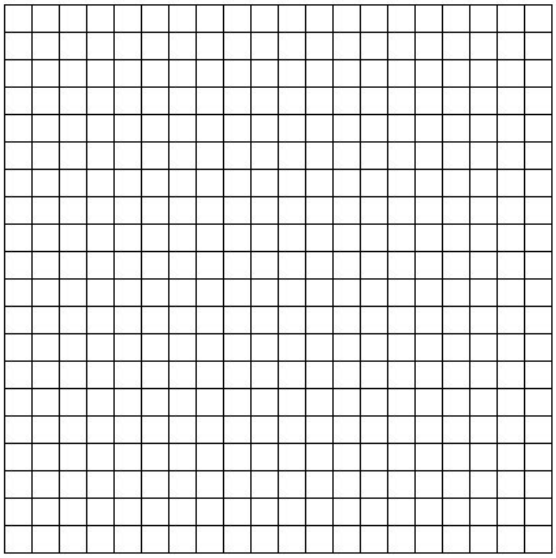
R = R^2 = S =

Interpret each of the above measures (R, R^2, and S):

Describe the strength of the association:

Sketch the scatterplot with the regression equation on grid 1 AND the residual plot on grid 2:





Is a linear model appropriate? Use both graphs to describe.

State your conclusion about the association between TV's per household and life expectancy. Express your feelings about any lurking variables, outliers, or influential points that may exist.

Use the equation to predict the life expectancy given that the number of TV's per 1000 is 500.

Use the equation to predict the number of TVs per 1000 if life expectancy is 80.

Should we use the equation to predict the number of TV's per 1000 if life expectancy is 100?

Part 2: Global Warming (*Complete together, write up do be done by group member 2*)

The following table lists the atmospheric CO_2 levels and Energy Consumption for various years from 1960 to 1990:

Year	CO_2 Level (parts per million by volume)	Gross Energy per Capita (millions of BTU per year)
1960	316.748	242.4
1965	319.873	271.2
1970	325.517	323.7
1975	330.986	326.4
1980	338.515	333.8
1985	345.726	309.6
1990	354.037	326.9

Analyze CO_2 Levels:

Mean: Median: Range: IQR: S_x:

Create a box plot:

Analyze Consumption Levels:

Mean: Median: Range: IQR: S_x:

Create a box plot:

Regression Modeling 1 Use Year as the explanatory variable and CO_2 as the response variable.

Find the regression equation:

Interpret the slope in context

Interpret the y-intercept in context

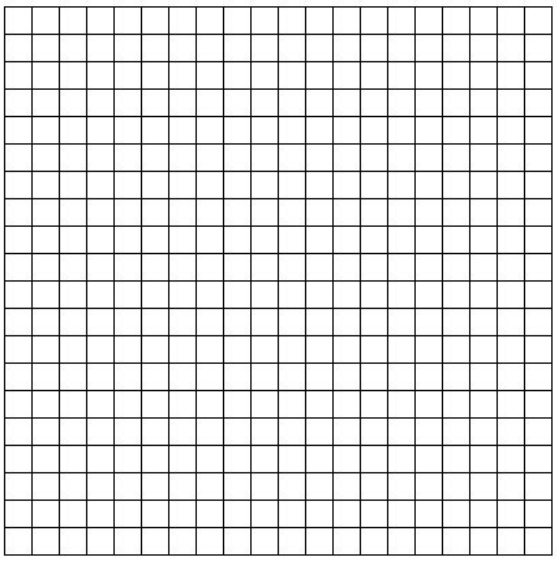
State the correlation, Standard Error of the residuals and Coefficient of Determination

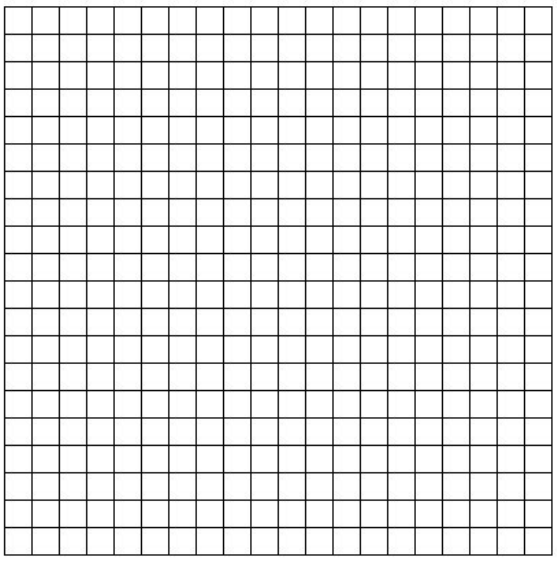
R = R^2 = S =

Interpret each of the above measures (R, R^2, and S):

Describe the strength of the association:

Sketch the scatterplot with the regression equation on grid 1 AND the residual plot on grid 2:





Is a linear model appropriate? Use both graphs to describe.

State your conclusion about the association between year and CO_2 level.
Express your feelings about any lurking variables, outliers, or influential points that may exist.

Regression Modeling 2 Use Year as the explanatory variable and Consumption as the response variable.

Find the regression equation:

Interpret the slope in context

Interpret the y-intercept in context

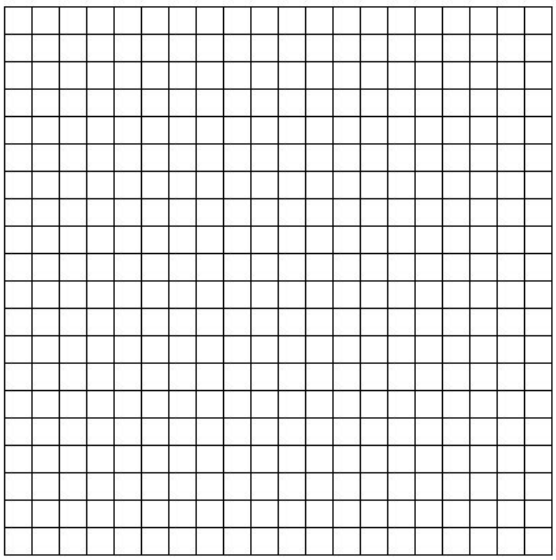
State the correlation, Standard Error of the residuals and Coefficient of Determination

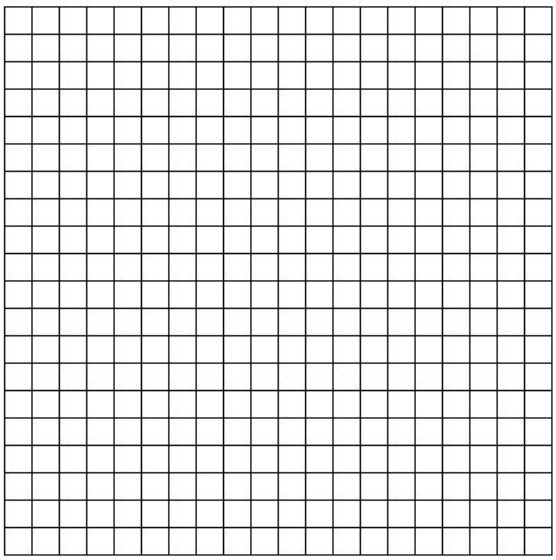
R = R^2 = S =

Interpret each of the above measures (R, R^2, and S):

Describe the strength of the association:

Sketch the scatterplot with the regression equation on grid 1 AND the residual plot on grid 2:





Is a linear model appropriate? Use both graphs to describe.

State your conclusion about the association between year and Consumption level.
Express your feelings about any lurking variables, outliers, or influential points that may exist.

Regression Modeling 3 Use Consumption as the explanatory variable and CO_2 as the response variable.

Find the regression equation:

Interpret the slope in context

Interpret the y-intercept in context

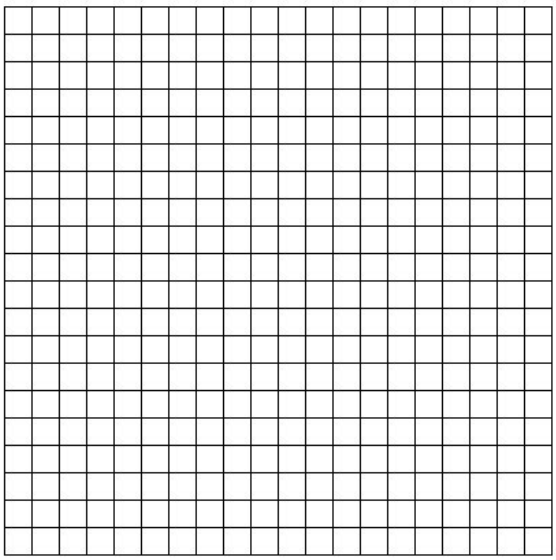
State the correlation, Standard Error of the residuals and Coefficient of Determination

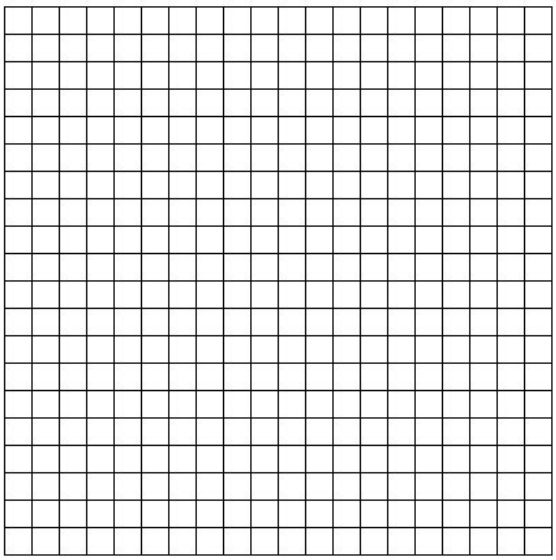
R = R^2 = S =

Interpret each of the above measures (R, R^2, and S):

Describe the strength of the association:

Sketch the scatterplot with the regression equation on grid 1 AND the residual plot on grid 2:





Is a linear model appropriate? Use both graphs to describe.

State your conclusion about the association between consumption and CO_2 level.
Express your feelings about any lurking variables, outliers, or influential points that may exist.

Use the equations to predict the CO_2 in the year 1982.

The actual in 1982 was 340.959, find the residual.

If CO_2 level is 345, then what is the year AND what is the consumption level?

Use the equations to predict the consumption in the year 1977.

The actual in 1977 was 346.5, find the residual.

If consumption is 350, then what is the year AND what is the CO_2 level?

Should we use the equation to predict the CO_2 level in 2020?

Part 3: Find your own Statistics article in the news.

Find a newspaper article that uses regression analysis to verify or contradict the global warming arguments made in part 2. Make sure to note the variables, the equation, and the conclusions. On day 2, you will describe your article and the distribution to the class.

Part 4: Read a Statistics article.

Read the article on Regression to the Mean.

Think of a time where you were an outlier (above or below) to your usual performance. Describe this incident. When did you return to normal? Alternate idea: when did you fall for the gambler's fallacy?