STAT 145 - MINI PROJECT I
REGRESSION (OPTIONAL)

Your objective in this project is to find the relationship between two quantitative variables by using a Least Squares Regression Line.

1. Choose a Problem & Collect Data

You can start by choosing an individual (your favorite sports team, U.S. cities, people on campus) and choosing two quantitative variables that correspond to it. For example, you could choose:

(1) **Individual** - Teams in the NFL
   Response Variable - # of wins last season
   Explanatory Variable - How much $ the Quarterback got paid last season

(2) **Individual** - U.S. Counties
   Response Variable - % of population below poverty level
   Explanatory Variable - % of population with a Highschool Diploma

2. Create a Scatterplot (20 PTS)

You should construct a scatterplot of the data you chose (10 pts). You are free to do this by hand, but I highly reccomend figuring out how to do it in Excel. From your Scatterplot, does it appear that there is a relationship between the variables? Describe the relationship (strength, direction, form) (10 pts).

3. The Regression Line (60 PTS)

I highly reccomend using Excel for this section as it will make your life a lot easier. Calculate the mean and standard deviation of each variable (10 pts).

Next you should calculate the correlation. Describe what this tells you about the data. Does this agree with what you said in part 2? Calculate R^2, and say what this means in terms of your problem (20 pts).

Find the equation of the Regression Line for this problem (20 pts). Give the scatterplot again, this time with the Regression Line on it (10 pts).

For bonus points, provide a plot of the Residuals (10 pts) and explain what this says about the fit of the regression line.

4. Prediction (20 PTS)

Now you should use your Regression Line for prediction. Choose 1 or 2 values for the Explanatory Variable and use your Regression Line to predict the value of the Response Variable.

For example, if you chose problem (1) above, then you could choose the Dolphin's. The Dolphin's quarterback makes an average salary of 19.25 million dollars. You can plug that into your regression equation and get a prediction for the number of wins the Dolphin's should have had last season. See how close this was to the actual value. Calculate the residual and explain what this means.