In this team project you will apply what you have learned about Expected Value and Probability; Statistics relating to Univariate and Bivariate data; and/or Normal Distributions. Your team will design and conduct an investigation of your preferred type. You will follow the guidelines below and include a statement of your goals, and a conclusion about what your project reveals. Your team will present a report to your instructor.

**Key Aspects:**

* Work with one other student
* Submits a report - no presentation
* Create at least one misleading graph with a note explaining the bias
* Select a Project Type:  
  \* Expected Value Game  
  \* Uni- or Bi-Variety Data Collection
* Get Project Approved by Instructor

**The Two Project Types:**

***Expected Value Game***  
Develop a game with at least 7 outcomes and 7 payoffs. Play the game at least 700 times and document that fact. Calculate the experimental and theoretical probability and determine the EV for the game both ways. Contrast the two EV numbers and determine the total EV if you played the game 7 times.

***Uni- or Bi-Variety Data Collection***  
State a hypothesis about the data of interest and then collect at least 21 values.   
  
*Univariate Data Collection* - Determine the 5 number summary and the three measures of central tendency, check to see how Normal the distribution and calculate where 68% of the data lie. Produce at least two plots that are well labeled. Report the 1-variable stats on the data and explain their meaning in context. Select a p value to test against and do a t-Test. Report your findings.

*Bivariate Data Collection* - Create a Scatter Plot of the data and do at least 5 regressions looking at the stat results and reporting all R2 values. Select the best model and interpolate and extrapolate at least 7 values and speak to conditional Domain and Range limitations.

**Guidelines**

1) Choose from the two project types focused on you and your partner’s interest.  
2) Design a plan for your project.

3) Meet with your instructor to get suggested modifications and approval.

4) Collect at least the minimum number of data points.

5) Graphically display your data several ways.

7) Evaluate your data and support or reject your expectations/hypothesis.

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| **Objective** | **3** | **2** | **1** |
| **Data Analysis and Organization [24 points]** | Clear, complete, and appropriate analysis of the data leading to a conclusion.  Appropriate and relevant use of several of graphical displays.  At least one misleading graph with explanation. | Most data analysis is correct. The use of some of the required statistical measures with very few inappropriate uses | Incomplete, inappropriate and/or lack of use of statistical measures, graphs, and analysis |
| **Presentation [24 points]** | Statement of the problem is complete and clear.  At least two graphical representations of the data.  Explanation of the process use to examine the data.  Statement of the results of the project with conclusions and projections. | A few missing aspects with minor missteps. | Major items missing and inappropriate actions. |
| **Use of Mathematics [15 points]** | Correct and appropriate application of mathematics principals of statistics | A few minor and cosmetic errors | Limited understanding of mathematical concepts shown |
| **Language Arts [12 points]** | Statistical terms and vocabulary, correct and appropriate grammar (written and oral). | A few missteps that confuse and cloud understanding | Unacceptable usage and major missing terms and vocabulary |
| **Following Directions/Protocols [24 points]** | No violations | Few minor violations | Major violations |
| **Collaboration**  **[12 Points]** | Clear evidence of teamwork on the project | Some evidence of collaboration | No evidence that the team worked together on the project |