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# Project Charter

**Meeting plan**

During the design phase, we plan on meeting after class on Tuesdays as well as Sunday mornings.

During the implementation phase, we plan on meeting after class on Tuesdays and Thursdays, as well as Sunday mornings. Additionally, if these times are not enough, we plan on adding Friday afternoons.

**System proposal**

We plan on implementing a regression analysis and graphing tool. Users will be able to input a set of data points. Our system will perform regression analysis and produce a best fit function, a graphical representation, and statistical information about the function.

**Key features**

- Given a dataset input
    - Create a regression function
    - Create a graphical representation of the regression function
    - Provide statistical measures of the regression function (e.g. $R^2$ value)
- Given a function input Create a graphical representation
    - Create randomized datasets with user-input parameters

**Description of system**

The user will interact directly using the terminal. We plan on using a REPL similar to the one implemented in the A2 Adventure Game. The REPL will interactively ask the user for various input (e.g. What regression model would you like to apply?) as well as allow the user to choose which types of output(s) they would like (i.e. graph, function, statistical measures). Graphical representations will be saved as a .jpg file in the current directory. We plan on implementing the statistical calculations but using a third-party library to create the graphical representation.

We plan on first implementing simple linear regression. Our plan gives rise to a number of extensions of which we plan on exploring as many as time permits:

- Multivariate linear regression
- Polynomial regression
- Logistic regression
- Probability distributions (i.e. binomial, cumulative, Poisson, etc)