Requirements Specifications

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***Goals & Structure:***

To design a program that will require the user to specify the dimensions of materials needed to build a bridge. This will be a entertainment oriented program that will prompt the user to either create an account or log into an existing account. The user will then be given a random car and its weight and must enter the materials and dimensions required for a bridge to hold a the specific car. If the bridge fails to support the weight of the car, then the user loses the game and exits the program. If they succeed, then they will be given a score based on their efficiency with their materials. This score will be added to a scoreboard. At the end of the program, the three highest scores will be outputted along with their associated usernames.

***Requirements:***

This program will require the use of I/O file system for the account portion and scoreboard part of the game. Classes will be used for the random car generator. Many functions are also necessary for this program, which are essential for the organization and efficiency of the code. For the same reason, we will need an appropriate amount of header files and cpp files within the program.

An extensive application of mathematical calculations will be needed in order to find whether the bridge, (with basic assumptions on temperature, and load distribution), would break under the weight of the passing car. We are using equations in mechanics of materials to find this breaking point. After this breaking point is found, more functions will be required to find how far off the user was from that point and what score should be awarded.

**UML:**

|  |
| --- |
| Car |
| * string name * double weight |
| * string getName() * void setName(string Name) * double getWeight(); * void setWeight(double Weight)   ostream& operator<<(ostream& os, Car& c); |