LM2 Questions

**Part 1:**

**Question 1:** I initialized this program with 2 variables. There is no way to do this task with less variables because you need at least those two variables to do addition and subtraction with 2 different numbers.

**Part 2:**

**Question 1:** I used static\_cast while declaring my duration variable. Since duration is distance divided by speed, and since it would be desirable to see almost exactly how long a trip is, I declared duration as "float duration = static\_cast<float>(duration)/speed". This makes it so that duration, which was an integer variable, and speed, which is also an integer variable, divide to get a floating point variable to give a more precise answer.

**Part 4:**

**Question 1:** The modulus operator is a essential for the rand() function because it gives the maximum range for the function to grab a "random" number from. For example, rand() % 7 is declaring a random number between 0 (the default minimum), and 7. The reason why it cannot go over 7 is because since rand() outputs a random integer, and modulus returns a remainder. There can only be a remainder of 0-6 if you modulus any number by 7.

**Question 2:** To do this same process but with floats, either the static\_cast command, or a number with a decimal must be used. Since there are more places in decimal numbers, if you use rand()%1000 for integers, you have to add two zeros onto the end to account for the two decimal places. That would make it rand()%100,000. If rand() is equal to 853, then 853%100,000 is just 853. To make this number a decimal, you must then divide by any positive exponent of 10.Since we want two decimal places, we would use 100 in this scenario. However, make sure that to use 100.0, or static\_cast<float>(100). If you don't, the result will be an integer and all this work will have been for nothing. The final result will look something like this: "(rand()%100,000)/100.0" This will give you a totally (pseudo) random floating point value between 0 and 1000.