Homework 4: Functions
Due: Thursday, Oct. 27th by 8:30am

This homework is an individual assignment. Refer to the syllabus for appropriate collaboration policies. Your collaboration statement should be included as a comment at the top of your web page.

Create a single webpage and name it hw04-lastname.html. This webpage will contain your code for both part 1 and part 2 of this assignment. A sample view of the assignment has been included for you at the end of this document.

Part I: Bits and Bytes
Recall from chapter 1 that computers store information as bits. In general N bits, can represent \(2^N\) pieces of data. (Review the materials from earlier this semester if you do not remember how this works or why this is true!)

For part 1, your webpage should display a textbox to the user. The user should be able to input a number of bits in this box. Your webpage should also contain an appropriately labeled button. When the user clicks this button, the webpage should execute a function called Bits() which you write. This function should get a number from the user's textbox, and then compute how many unique things could be represented using this number of bits. You should use the Math library functions in your calculations. Your function should also display the information to the user (see the figure below).

Part II: Calculating Statistics
In this part, you will build a webpage to calculate basic statistics such as the mean and sample standard deviation of a list of 4 numbers. Write a function called calcStats which is invoked by a button on your webpage. This function should get numbers from 4 textboxes and calculate the mean (average) and standard deviation of these numbers. Standard deviation can be calculated by the following mathematical formula:

\[
S = \sqrt{\frac{\sum(X-M)^2}{n-1}}
\]

X represents each data point, M represents the mean, and n represents the number of pieces of data.

See [wikipedia's page on Std Dev. calculations](https://en.wikipedia.org/wiki/Standard_deviation) for an example, but note that we're using a sample standard deviation which divides by n-1 instead of simply n.

Again, using the Math library functions will make your calculations clearer and simpler. After calculating these statistics, your web page should display the result to the user.
Sample:

Bit Calculations

Enter the number of bits: 5

Calculate Representation

5 bits can represent 32 unique items.

Statistics Calculator:

Enter 4 numbers: 2 3 4 5

Compute Statistics

The average of 2, 3, 4, and 5 is 3.5 and the standard deviation is 1.2909944487358056

Notes:

- All functions should have appropriate comments.
- Be sure to include your collaboration statement in your webpage.
- For both exercises, you can assume that the user does not leave any textboxes blank.

Submit: Archive/zip your html file and name it hw04-lastname.zip. Submit it to Blackboard for HW04.