Problem 1 - 50 points

Write a JavaScript program to find the average of the factorial of the numbers in an array.

- Create an array with 10 random positive integers.
- Create a function to find the factorial of a number. A factorial is defined as the product of all numbers from 1 to that number.
- Iterate through the array to sum up the factorials and then find their average.
- Print the average in an alert box.

Problem 2 - 50 points

Write a JavaScript program to count the occurrences of each vowel in a string.

- Read in a string from the user. You can assume the input will come in from a text box called “sentence” in a form called “inputForm”.
- Initialize 5 count variables, one for each vowel.
- Iterate through the string and increment the appropriate vowel count if a vowel is found.
- Print the result through the console log.

Problem 3 - Extra Credit: 50 points

Write a JavaScript program to change the page contents based on user input.

- Create an array of objects where each object consists of 2 properties - name and imageURL. You can initialize them to the following:
  1. Name: Spongebob Squarepants.
     ImageIcon: sponge.png
  2. Patrick Star
     ImageURL: star.jpg
3. Name: Squidward Tentacles  
   ImageURL: squid.jpg

4. Name: Sheldon J Plankton  
   ImageURL: plankton.png

- Write a function called “change”. You can assume it will be triggered by pressing a button.
- In the function, read in a number from the user. You can assume this comes from a form called “myForm” with a text box called “character”.
- Change the inner HTML of a paragraph with the id “charName” to the name of the corresponding character. For example, if the user had 1, set the paragraph to say “Spongebob Squarepants”.
- Similarly, change the href for an image tag with the id “charImg” to the corresponding ImageURL.
- If the user has an invalid number, set the paragraph to say “invalid”. Don’t change the image.