Assignment 4 – Functions

Due Wednesday, June 5, 2013

For this assignment, please note that NO jQuery may be used. You must write everything in core JavaScript

1) Write a function multiple that determines, for a pair of integers, whether the second integer is a multiple of the first. The function should take two integer arguments and terutn true if the second is a multiple of the first, and false otherwise. Incorporate this function into a script that inputs a series of pairs of integers (one pair at a time). The HTML5 form should consist of two text fields and a button to initiate the calculation. The user should interact with the program by typing numbers in both text fields, then clicking a button.

2) Write a function qualityPoints that inputs a student's average and returns 4 if the student's average is 90 – 100, 3 if the average is 80-89, 2 if the average is 70-79, 1 if the average is 60-69, and 0 if the average is lower than 60. Incorporate the function into a script that reads a value from the user.

3) Write a script that simulates coin tossing. Let the program toss the coin each time the user clicks the Toss button. Count the number of times each side of the coin appears. Display the results. The program should call a separate function flip that takes no arguments and returns false for tails and true for heads [Note: If the program realistically simulates the coin tossing, each side of the coin should appear approximately half the time.]

4) Computers are playing an increasing role in education. Write a program that will help and elementary-school student learn multiplication. Use Math.random to produce two positive one-digit integers. It should then display a question such as:

   How much is 5 times 6?

   The student then types the answer into a text field. Your program checks the student's answer. If it's correct, display the string "Very good!" and generate a new question. If the answer is wrong, display the strong "No. Please try again." And let the student try the same question again repeatedly until he or she finally gets it right. A separate function should be used to generate each new question. This function should be called once when the script begins ececution and each time the user answers the question correctly.

5) The user of computers in education is referred to as computer-assisted instruction (CAI). One problem that develops in CAI environments is student fatigue. This problem can be eliminated by varying the computer's dialogue to hold the student's attention. Modify the program in question 4 to print one of a variety of comments for each correct answer and each incorrect answer. The set of responses for correct answers are as follows:

   Very good!
   Excellent!

Nice Work!
Keep up the good work!

On the other hand, the set of responses for incorrect answers are as follows:

No. Please try again.
Wrong. Try once more.
Don't give up!
No. Keep trying.

Use random number generation to choose a number from 1 to 4 that will be used to select and appropriate response to each answer. Use a switch statement to issue the responses.

6) Write a function that returns the total cost of any number of buckets of paint. Ask the user how many buckets he or she is going to buy and for the cost of one bucket. Ask the user the color of the paint. Calculate and return what he or she owes. Change the color of the font to the color of the paint. Use the catch/try/throw statements to check for invalid input if the user doesn't give you a valid value for the number of buckets, such as a number less than 0, or gives you no input, or types in a string, and so on, check that the user doesn't give you a color of paint that is the same color as the background of your document or you will not be able to see the color of the font.

7) Write a function that will create a clock object.
    a. It will have three properties: seconds, minutes, and hours.
    b. Write two methods: setTime() to set the current time and displayTime() to display the time.
    c. The user will be prompted to select either a.m./p.m., or military time. The value he or she chooses will be passed as an argument to the displayTime() method.
    d. The output will be either 14:10:26 or 2:10:26 pm depending on what argument was passed to the display() method.

8) Write a script that plays a "guess the number" game as follows: Your program will choose the number to be guessed by selecting a random integer in the range of 1 to 1000. The script displayed the prompt: "Guess a number between 1 and 1000" next to a text field. The player will then type a first guess into the text field and click a button to submit the gues to the script. If the player's guess is incorrect, your program should display "Too high. Try again." **or** "Too low. Try again." to help the player zero in on the correct answer and should clear the text field so the user can enter the next guess. When the user enters the correct answer, display *Congratulations. You guessed the number!* and clear the text field so the user can play again. [Note that this guess technique is similar to a binary search which will be explored in more detail on the next assignment]

9) Modify question 8 to count the number of guesses the player makes. If the number is 10 or fewer, display *Either you know the secret or your got lucky!* If the player guesses the number in 10 tries, display *Ahah! You know the secret!* If the player makes more than 10 guesses, display *You should be able to do better!* [Q: Why should it take less than 10 guesses? Well, with each good guess, the player should be able to eliminate half the numbers.}