Assignment 5 – Arrays

Due Wednesday, June 12, 2013

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

1) Use a one-dimensional array to solve the following problem: A company pays its salespeople on a commission basis. The salespeople receive $200 per week plus 9 percent of their gross sales for that week. For example, a salesperson who grosses $5000 in sales in a week receives $200 plus 9 percent of $5000, or a total of $650. Write a script (using an array of counters) that obtains the gross sales for each employee through an HTML5 form and determines how many of the salespeople earned salaries in each of the following ranges (assume that each salesperson's salary is truncated to an integer amount):
    a. $200-299
    b. $300-399
    c. $400-499
    d. $500-599
    e. $600-699
    f. $700-799
    g. $800-899
    h. $900-999
    i. $1000 and over

2) Write JavaScript statements (or create a .js file) that perform the following operations for a one-dimensional array. Please feel free to create any data that you need (sample arrays), to complete the problems:
    a. Set the 10 elements of array counts to zeros
    b. Add 1 to each of the 15 elements of array bonus
    c. Display the five values of array bestScores, separated by spaces
    d. Display the value of the seventh element of array f
    e. Total the elements of array c, which contains 100 numeric elements
    f. Copy 11-element array a into the first portion of array b, which contains 34 elements/
    g. Determine and print the smallest and largest values contained in 99-element floating point array w.

3) Use a one-dimensional array to solve the following problem: Read in 10 numbers, each of which is between 10 and 100. As each number is read, print it only if it is not a duplicate of a number that has already been read. Provide for the "worst case", in which all 10 numbers are different. Use the smallest possible array to solve this problem.

4) Write a script to simulate the rolling of two dice. The script should use Math.random to roll the first die and again to roll the second die. The sum of the two values should then be calculated [Note: Since each die can show an integer value from 1 to 6, the sum of the values will vary from 2 to 12, with 7 being the most frequent sum, and 2 and 12 the least frequent sums. Your program should roll the dice 36,000 times. Use a one-dimensional array to tally the number of times each possible sum appears. Diesplkay

the results in an HTML5 table. Also, determine whether the totals are reasonable [e.g. there are size ways to roll a 7, so approximately 1/6 all rolls should be 7].

5) A prime integer is an integer greater than 1 that's evenly divisible only by itself and 1. The **Sieve of Eratosthenes** is an algorithm for finding prime numbers. It operates as follows:

   a. Create an array with all elements initialized to 1 (true). Array elements with prime indices will remain at 1. All other array elements will eventually be set to zero.

   b. Set the first two elements to zero, since 0 and 1 are not prime. Starting with array index 2, every time an array element is found whose value is 1, loop through the remainder of the array and set to zero every element whose index is a multiple of the index for element with value 1. For array index 2, all elements beyond 2 in the array that are multiples of 2 will be set to zero (indices 4, 6, 8, 10, etc.); for array index 3, all elements beyond 3 in array that are multiples of 3 will be set to zero (indices 6, 9, 12, 15, etc.), and so on …

   When this process is complete, the array elements that are still set to 1 indicate that the index is a prime number. These indices can then be printed. Write a script that uses an array of 1000 elements to determine and print the prime numbers between 1 and 999. Ignore element 0 of the array.

6) Consider a two-by-three array t that will store integers [Thinking about multi-dimensional arrays] (Feel free to use any data that you would like):
   a. Write a JavaScript statement that declares and creates array t
   b. Write the names of all the elements in row 1 of t
   c. Write the names of all elements in the third column of t
   d. Write a nested for statement initializes each element of t to zero
   e. Write a series of JavaScript statements that determines and prints the smallest value in array t
   f. Write a series of statements that prints the array t in neat, tabular format. List the column indices as headings across the top, and list the row indices at the left of each row.