Practice Problems

1. Write a program that asks the user to input 10 integers. After squaring the integers, print out the integers that are not divisible by 3 and 4.

2. Create an 8 by 8 board where all positions are 0, except the diagonals. Sample output:

   1 0 0 0 0 0 0 1
   0 1 0 0 0 0 1 0
   0 0 1 0 0 1 0 0
   0 0 0 1 1 0 0 0
   0 0 0 1 1 0 0 0
   0 0 1 0 0 1 0 0
   0 1 0 0 0 0 1 0
   1 0 0 0 0 0 0 1

3. Construct a program that displays a pyramid of Xs of the screen. The pyramid should look like this.

   X
   X X X
   X X X X X
   X X X X X X
   X X X X X X X
   The number of lines should be dictated by a user input.

4. Write a program that will input an integer n, calculate the sum of the positive integers from 1 through n and output the sum

5. Given an array of 10 integers:

   int a[10] = (15, 21, 3, 92, 48, 29, 12, 46, 34, 12);

   a. Write a program that will add up the values stored at the even index positions in the array (i.e. 0,2,4, … ).
   b. Write a program that will add up the values stored at the even index positions in the array (i.e. 0,2,4, … ) but only if the value of the elements in those positions are even.
   c. Write a program that will add up the values stored at the odd index positions in the array (i.e. 1,3,5, … ) but only if the value of the elements in those positions are even.

6. Write a program that inputs an integer n, and outputs all the numbers that divide n. For example, if n=6, output : 1,2 3. Don’t output the number n itself.

7. Read the entries of an array of 10 integers from a user. Compute x as the average of the 10 entries and then compute the average of those entries that are greater than or equal to x. Print this final average.
8. Write a C++ program that sets up an array of integers with capacity 20. It should then generate the 20 entries randomly in turn. Each entry must be an integer between 1 and 20, however it must also be different from all previous entries in the array. Generate the entries as random numbers and repeatedly make new numbers until a legal entry value is found. The program should finish by printing the list of 20 array values that it has selected.

9. Create a 2-dimensional array with 10 rows and 10 columns. Fill the array with random 3 digit integers. Print out the column with the largest sum. (If two or more columns share the largest sum, print out one of them only.)