Lab #6

Introduction to Algorithms

You are given an incomplete program Bubble\_SortLab.cpp, containing a main program and a function.

Complete the Bubble Sort function by adding the necessary code, according to the pseudocode given in the class.

1. Complete the main program so that you can test the Bubble Sort algorithm. Create an array with 100 elements, with the elements in reverse order: i.e. 100, 99, 98,…,1 using a for loop. After the Sort is complete, print out all the elements to check that they are sorted.

2. Modify the main program so that it will set up an array with 100 elements which are random numbers. Use the random number generator rand() function for this. Use an assignment like A[i] = rand() % 100 + 1 to set up the numbers, and print them to check that they are “*random”*. Sort them and then print them out to check they are sorted. Note, you need to #include <stdlib.h> for the random function.

**Extra Work**. You may need to do this in your own time. Modify the Binary Search program, so that it creates and prints out the Table of values for the array shown below. Test it for both the keys **14 and 30**. The array of elements is:

**12 13 14 16 17 18 21 24 27 30.**

**Tutorial 6.**

For the tutorial we will go over the Bubble Sort algorithm for the arrays below.

**a. 12 7 20 11 8 6**

**b. 20, 19, 18, 17, ...,2, 1**

**c. 50, 49, 48,...,3, 2, 1**

How many passes are needed for each array, and how many comparisons are needed for each array? Show how you compute your answers.