## Summer Assignment

The objective of this assignment is to get everyone familiar with C++ at a very basic level. You should be in a position to submit these assignments via email at the first class session where you will be given instructions on how to submit your work. It is very important that you take this seriously. Not only will the assignment count towards your grade, but the course will assume a programming ability at this level. If you are already familiar with C++, you should find these easy. If not, you can do these as you read through a book on C++ programming.

**1. Compiling and running a program**

This is just to make sure you have the mechanics of editing and running a program. Write a simple program, based on the \Hello, world" example, which produces the output:

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**2. Using Price Data**

We have included price information from http://www.cboe.com that includes daily prices for the S&P500 Index (SPX) from 01/01/2004 to 12/31/2004. You are required to write functions/methods in an appropriate class structure to achieve what is described below:

a) **Load_Price_Data:** This function should take the file name, sort method (QuickSort or BubbleSort) and sort preference (ascending or descending) as parameters and load contents of a file into an array and be sorted based on the sort preference using the sort method indicated.
b) **Get_Prices**: This function should take a *FromDate,* a *ToDate* as parameters and returns an array (or list) of prices of SPX for the period between the *FromDate* and the *ToDate*. (Inclusive of both dates)
c) **Compute_Average**: This function should take a *FromDate,* a *ToDate* as parameters and return the average value of SPX for the period between the *FromDate* and the *ToDate*. (Inclusive of both dates)
d) **Compute_Max:** This function should take a *FromDate*, a *ToDate* as parameters and return the maximum value of SPX for the period between the *FromDate* and the *ToDate*. (Inclusive of both dates)
e) **Compute_Moving_Average**: This function should take a *FromDate,* a *ToDate,* a *WindowSize* as parameters and return tan array of moving average values of SPX for every time window of *WindowSize* starting with the *FromDate* and ending with the *ToDate* (Inclusive of both dates). So the first average computed is the average value of prices in the window (*FromDate, FromDate+ WindowSize-1 ). The* second average computed is the average value of prices in the window (*FromDate+1, FromDate+WindowSize )...*and so on..
f) **Insert_Price:** Given a date and a price insert the price into the sorted array keeping the array sorted. If a price for the date is missing you add an element, else update the existing price.

Write a “main” program that calls these functions and outputs the results of your function calls to a file Results.txt as follows.

“The Prices of SPX between 08/15/2004 and 08/20/2004 are: “
“The Average Price of SPX between 08/15/2004 and 09/15/2004 is: “
“The Maximum Price of SPX between 04/15/2004 and 06/15/2004 is: “
“The Moving Average of SPX between 08/15/2004 and 09/15/2004 for WindowSize 10 is : “

You have been informed that PriceCorrections.txt contains some prices that are missing or incorrect in the original price. Incorporate these corrections into the original array by using Insert_Price written in section (f).