



Data Structures

CS 246

Department of Physics and Computer Science

Medgar Evers College

Exam 2

Direction: Modify the "exam02.cpp" file in your Exams directory of your GitHub repository; and then, submit your modified work in the Exams directory of your GitHub repository or Dropbox, or in your Exam02 google classroom assignment. You can only use the libraries included in the accompanying header files and the cpp file.

Problem	Maximum Points	Points Earned
1	5	
2	5	
3	5	
4	5	
Total	20	

Problems

1. Write the definition of the function `PossiblePairs()` whose header is

```
bool PossiblePairs(Array<int>& a, Array<int>& b, int n)
```

It returns true if for every element in *a* there is an element in *b* such that their sum is greater than or equal to *n*; otherwise, it returns false. If either *a* or *b* is empty, it returns false.

2. Write the definition of the function `InsertionSort()` whose header is

```
template <typename T>
void InsertionSort(Node<T>& root)
```

Given that *root* is referencing a doubly linked list, it sorts the list using the insertion sort method. It must sort the data of the linked list; not the nodes of the linked list.

3. Write the definition of the function `ValidTriplet()` whose header is

```
bool ValidTriplet(string word)
```

It returns true if *word* contains an 'a', 'b' and 'c' in that order with any number of characters before, after and between them; otherwise, it returns false. The letters 'a', 'b' and 'c' can be in any case. For instance, the function calls `ValidTriplet("ruiguaohoBquiacwwe")` and `ValidTriplet("gvebBidaurhC")` will evaluate to true and false respectively.

4. Write the definition of the function `MinimumCount()` whose header is

```
int MinimumCount(Array<double>& data)
```

It returns the amount of times the minimum value of *data* appears in *data*. If *data* is empty, it returns 0. For instance, if *data* = [7, 1, 4, 9, 6, 7, 1, 3, 2, 6, 9, 5, 9], it will return 2 since 1 appears twice.