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 `IsMVCSudoku()` whose header is

```
bool IsMVCSudoku(Vector<int>& bd)
```

   It returns true if *bd* represents a mostly valid completed sudoku puzzle. A mostly valid completed sudoku puzzle is a 9×9 grid (81 cells) that consists only of the digits 1 through 9 such that no digit is repeated in any row and column. You can use the formula $f(r, c) = 9r + c$ to convert indices of a 9×9 array to an index of an equivalent one dimensional array.

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

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

   Given that *root* is referencing a doubly linked list, it sorts the list using the selection 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 `AdjacentDuplicateRemoval()` whose header is

```
string AdjacentDuplicateRemoval(string str)
```

   It returns a reduce form of the *str* that has no adjacent duplicates. A string has an adjacent duplicate if two adjacent characters are equal. For instance, The function calls `AdjacentDuplicateRemoval("abbaca")` and `AdjacentDuplicateRemoval("passse")` will evaluate to `"ca"` and `"pase"` respectively.

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

```
template <typename T>
int NthOccurrence(Array<T>& data,const T& value,int n)
```

   It returns the index of the nth occurrence of *value* in *data*. If n is not positive, *value* appears less than n times in *data* or *data* is empty, it returns -1.