Data Structures
CS 246 - ON40
Department of Physics and Computer Science
Medgar Evers College
Exam 1

Direction: Submit your typed work in the Exams directory of your github repository and/or as an attachment on Google classroom under the Exam01 assessment. All submissions should have their appropriate extensions.

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

1. Construct the runtime table and determine the runtime function of the following function for the worst-case scenario. Let the cost of every operation be 1. Write the function in terms of n and state what n represents.

```
int F(Array<int>& a)
{
 int n = a.Size();
 int m = (a[0] < a[n-1])?(a[0]):(a[n-1]);

 for(int i = 1;i < n / 2;i += 1)
 {
  int t = (a[i] < a[n-(i+1)])?(a[i]):(a[n-(i+1)]);

  if(m > t)
  {
   m = t;
  }
 }
 return m;
}
```

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

```
template <typename T>
ulong IndexOfValueAfter(const Array<T>& data,const T& value,const T& delimit)
```

It returns the index of the first element of *data* whose value equals *value* after the first element of *data* whose value equals *delimit*. If *data* is empty, *delimit* is not contained in *data*, or no instance of *value* is found after the first instance of *delimit*, the function returns to size of *data*. For instance, if *data* = `[1,3,4,2,1,4,2,3,1,3,4]`, *value* = `4` and *delimit* = `2`, the function will return 5.

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

```
template <typename T>
bool Complement(const Array<T>& ar1,const Array<T>& ar2)
```

It returns true if *ar1* and *ar2* has no values in common; otherwise, it returns false. If both *ar1* and *ar2* are empty, the function returns false.

4. Given the class **Identifier** whose private fields are

```
char middleInitial;
string lastName;
string firstName;
```

write the special member functions of **Identifier** such that its default values are `"Jane"`, `"Doe"`, `'N'` for *firstName*, *lastName* and *middleInitial* respectively.