Sinai University

Faculty of Information Technology

Computer Programming (2) **Quiz #2**

1-12-2018 **Model Answer** **Time allowed: One Hour**

Name: ..... ID: ……..……

Answer the following Questions [15 marks]

Question 1: [5 marks]

Define a class **Array**, whose objects are arrays of elements of type int. Class **Array** has two data members: ***data*** (array of int) that holds the elements of the array, and ***size*** (of type int) that holds the number of elements in the array. And class **Array** has the following functions:

- A **constructor,** which receives an int argument that represents the size of the **Array** object and initializes the array elements to zeros.
- **getSize()** that returns the size of an **Array** object.
- ***getelements()*** that read the elements of an array object from the keyboard.
- ***Showelements()*** that print the elements of an **Array** object on the screen.
- Operator = that copy the elements of a given **Array** object to another.
- **Operator = =** that compares two **Array** objects and returns true if they have the same elements.
- **Operator +** that sum the elements of a two given **Array** objects.

Using the class ***Array***, write a main program that performs the following tasks:

1. Create three objects, ar1, ar2 and ar3 of the class Array.
2. Read the elements of the two Array: ar1 and ar2.
3. Compare the two **Array** objects ar1 and ar2 and display one the following messages accordingly:
   - The two arrays are identical.
   - The two arrays are not identical.
4. Sum the elements of two **Array** objects ar1 and ar2 in ar3.
5. Copy the elements of **Array** object ar2 to **Array** object ar1.
6. Display the elements of the **Array** object ar3 and ar1.

```
#include<iostream>
using namespace std;
class Array
{
private:
	int data[100];
	int size;
public:
	Array(int s)
	{
		size = s;
		for (int i = 0; i < size; i++)
			data[i] = 0;
	}
	int getsize()
	{
		return size;
	}
	void getelements()
	{
		for (int i = 0; i < size; i++)
			cin >> data[i];
	}
	void showelements()
	{
		for (int i = 0; i < size; i++)
			cout << data[i];
	}
	void operator =(Array a1)
	{
			for (int i = 0; i < a1.size; i++)
				data[i] = a1.data[i];
			size = a1.getsize();
	}
	bool operator ==(Array a1)
	{
		bool ident = true;
			for (int i = 0; i < size; i++)
			{
				if (data[i] != a1.data[i])
				{
					ident = false;
					break;
				}
			}
			return ident;
	}
```

```
Array operator + (Array a1)
	{
		Array a3(10);
		for (int i = 0; i < size; i++)
		{
			a3.data[i] = data[i] + a1.data[i];
		}
		a3.size = size;
		return a3;
	}
};

void main()
{
	Array ar1(10), ar2(10), ar3(10);
	ar1.getelements();
	ar2.getelements();
	if (ar1 == ar2)
		cout << "The two arrays are identical.";
	else
		cout << "The two arrays are not identical.";
	ar3 = ar1 + ar2;
	ar1 = ar2;
	ar3.showelements();
	ar1.showelements();
}
```

With my best wishes