Lab 8

Object Oriented Programming

Instructions:

- Attempt the following tasks exactly in the given order.
- You are required to create a multi-file project for each task.
- Indent your code properly.
- Use meaningful variable and function names. Follow the naming conventions.
- Use meaningful prompt lines and labels for all input/output.
- Make sure that there are NO dangling pointers or memory leaks in your program.

Task 1

Create a Class MyArray with these functionalities.

```
class MyArray
{
private:
        int capacity;
        int noOfElements;
        int * data;
public:
        MyArray(int = 5);
        MyArray(const MyArray &);
        int& operator[](int);
        MyArray& operator=(const MyArray &);
        MyArray operator+(const MyArray &);
        void operator+=(const MyArray &);
};
```

Task 3

Write a C++ program which should perform the following tasks:

i. Create a class named **Teacher**. It contains the *name* of the teacher (a CString containing at most 40 characters) and the teacher's *office extension number* (an integer) as private member variables. Its only constructor requires the values of above two member variables as arguments.

ii. Create a class named **Classroom**. It contains a *room number* (an integer) and the *capacity* (an integer) as private member

variables, and its only constructor requires values of both as arguments.

iii. Create a class named **Course**. A Course contains a *course title* (a CString containing at most 20 characters), a *Teacher*, and a *Classroom*. Its constructor should require these **5 parameters**: course title, the name and office extension number of the *Teacher*, and the room number and capacity of the *Classroom*.

iv. Each of the above three classes should have a member function **display** which should display all attributes of a given object on screen.

v. Implement the **Copy constructor** and **Overloaded assignment operator** for each of the above three classes.

vi. Write a **main()** function that creates at two **Course** objects containing different values. Then, the **main()** function should ask the user about all details of a course and create a **Course** object using the user-given input. Then, the **main()** function should ask the user about all details of another course and **dynamically** create a **Course** object using the user-given input. Finally, the details of all created **Course**s should be displayed on screen.

vii. Now, implement another **overloaded constructor** for the **Course** class. This constructor should take these **3 parameters**: course title, a constant reference to a **Teacher** object, and a constant reference to a **ClassRoom** object. Then, write a **main()** function to test the working of this 3-parameter overloaded constructor as you did in **step (vi)**.