North South University

Department of Electrical and Computer Engineering

CSE 225L.13 (Data Structures and Algorithms Lab)

Lab 3: Classes & Objects

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Objective:

- Learn how to write classes and objects in C++ as you go through the given code provided in the manual.

Classes and Object:

Here, we will create a class called a dynamic array (shortened to dynArr), and the code description is as follows:

dynarr.h (Header File)	dynarr.cpp (Source File)
```cpp #ifndef DYNARR_H_INCLUDED #define DYNARR_H_INCLUDED class dynArr { private: int *data; int size; public: dynArr(); dynArr(int); ~dynArr(); void setValue(int, int); int getValue(int); }; #endif // DYNARR_H_INCLUDED ```	```cpp #include "dynarr.h" #include <iostream> using namespace std; dynArr::dynArr() { data = NULL; size = 0; } dynArr::dynArr(int s) { data = new int[s]; size = s; } dynArr::~dynArr() { delete [] data; } int dynArr::getValue(int index) { return data[index]; } void dynArr::setValue(int index, int value) { data[index] = value; } ```

Tasks for Students:

1. In the driver file (main.cpp), perform the following sub-tasks.
   a. Create two objects of this class, one with no constructor argument and one with argument 4.
   b. Take four input values from the user and store them in the array inside the second object using the set method.
   c. For the second object, print all the values you just stored.
      Note that, you cannot assign anything in the first object since the array inside it has size 0. Neither can you change the size of this array to some other size.
2. Modify the header and the source files. Add a member function **void allocate(int s)** which allows you to change the size of the array. Make sure that memory is not leaked.
3. Modify the header file and the source files again, so that it works for a two-dimensional array where all the rows are the same size. The user will specify the number of rows and columns as well as the content of the array, which you will take as input from the user in the main function.