CSC10003 – Object Oriented Programming

Week 02
Constructor - Detructor

Cảm ơn thầy Trần Duy Quang đã cung cấp template cho môn học

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Notes

Create a single solution/folder to store your source code in a week.

Then, create a project/sub-folder to store your source code of each assignment.

The source code in an assignment should have at least 3 files:

- A header file (.h): struct definition, function prototypes/definition.
- A source file (.cpp): function implementation.
- Another source file (.cpp): named YourID_Ex01.cpp, main function. Replace 01 by id of an assignment.

Make sure your source code was built correctly. Use many test cases to check your code before submitting to Moodle.

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Content

In this lab, we will review the following topics:

- How do constructors and destructors work in C++?

3 Assignments

A: YY: 02

H: YY: 06

For assignment 01 – 04, please do the following tasks:

1. Implement **at least 5 constructors**. Also add a `cout` statement to show that the method in called.
    a. Move constructor
2. Implement the destructor. Also add a `cout` statement to show that the method in called.
3. Implement a `toString()` method.
4. Implement a `clone()` method to create a new object having values as the existing object. It works like the copy constructor.

Finally, in the main function, create a series of objects and output them to the console. Run the program and inspect the output.

For example, with the Point2D class:

1. 5 constructors
    a. `Point2D();`
    b. `Point2D (int x);`
    c. `Point2D (int x, int y);`
    d. `Point2D (const Point2D &other);`
    e. `Point2D (string s); // s = “15,-2”`
    f. `cout` statement: `cout << “Point2D::Default cons” << endl;`
2. Destructor: ~`Point2D();`
    a. `cout` statement: `cout << “Point2D::Destructor” << endl;`
3. `toString()` method: Point 15, -2 => string “15,-2)
4. `clone()` method: `p2 = p1.clone();`

3.1 Assignment 1

Class. Point2D: x, y

3.2 Assignment 2

Class Triangle: Point2D A, B, C

3.3 Assignment 3

Class MyIntArray: int*a, int n

3.4 Assignment 4

Student: int id, char* fullname, char* address, double gpa

3.5 Assignment 5

Draw a class diagram and write a program in C++ with OOP style that can be used by a small theater to sell tickets for performances. The theater's auditorium has 15 rows of seats, with 30 seats in each row. The program should display a screen that shows which seats are available and which are taken. For example, the following screen shows a chart depicting each seat in the theater. Seats that are taken are represented by an * symbol, and seats that are available are represented by a # symbol:

```
                    Seats
          123456789012345678901234567890
Row  1    ***########*########*********###
Row  2    ###*************************##
Row  3    **##********########*******###
Row  4    **#####*********************######
Row  5    ********#########*********########
Row  6    ##########*************###
Row  7    ######*************##########
Row  8    ************#****############
Row  9    ##########****##############***
Row  10   ####************************
Row  11   #**********#######################**
Row  12   ##############*****************#
Row  13   ##*************########**######
Row  14   ##############################
Row  15   ##############################
```

Here is a list of tasks this program must perform:

- When the program begins, it should ask the user to enter the seat prices for each row. The prices can be stored in a separate array. (Alternatively, the prices may be read from a file.)

- Once the prices are entered, the program should display a seating chart similar to the one shown above. The user may enter the row and seat numbers for tickets being sold. Every time a ticket or group of tickets is purchased, the program should display the total ticket prices and update the seating chart.
- The program should keep a total of all ticket sales. The user should be given an option of viewing this amount.
- The program should also give the user an option to see a list of how many seats have been sold, how many seats are available in each row, and how many seats are available in the entire auditorium.

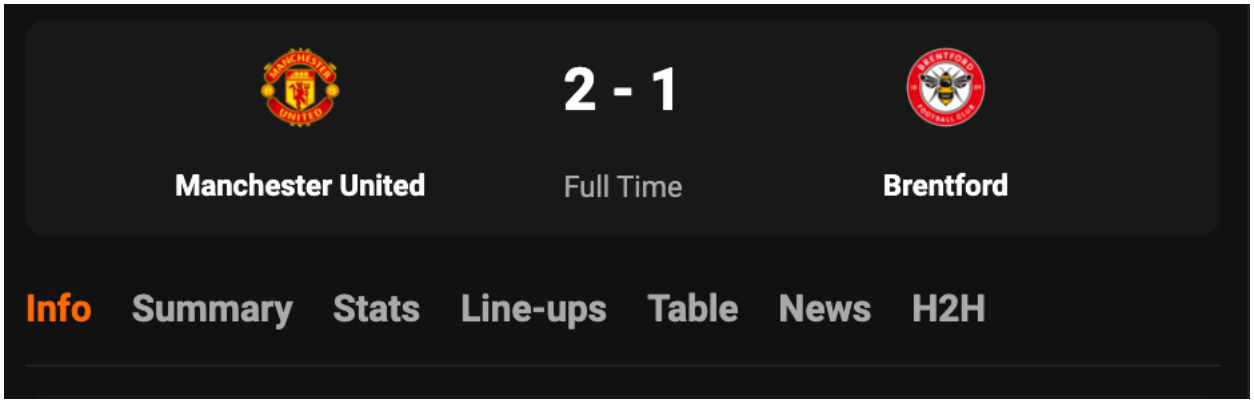
Input Validation: When tickets are being sold, do not accept row or seat numbers that do not exist. When someone requests a particular seat, the program should make sure that seat is available before it is sold.

3.6 Assignment 6

Draw a class diagram and write a simple console application in C++ to simulate this app.

Write a report to explain your solution.

Tab Info



Tab Summary

Manchester United	2 - 1 Full Time	Brentford

Info | Summary | Stats | Line-ups | Table | News | H2H

EVENTS | COMMENTARY

45 + 5'	J. Evans	0 - 1	E. Pinnock M. Damsgaard	
45 + 6'	E. ten Hag (Coach)			
HT		0 - 1		
47'	A. Garnacho M. Rashford	1 - 1		
54'	D. Dalot			
55'				C. Nørgaard
62'	R. Højlund B. Fernandes	2 - 1		
73'				K. Ajer
FT		2 - 1		