CS1580 - Introduction to Programming Lab (FS2024)
Lab 12

Lab Objectives

In this lab, you will be implementing the following topics:

- Classes
- Constructor
- Operator Overloading

Lab Task:

Create a class named **Time** with the following member variables and functions:

- Private Member Variables
  - `int hours, minutes, seconds;`

- Public Member functions:
  - `Time();`
    "Inline" default constructor that initialized the time to (0, 0, 0)

  - `Time(int h, int m, int s);`
    Parameterized constructor. Takes three integers (hours, minutes, seconds) and initializes the time object accordingly.
    Ensure that the values for minutes and seconds are between 0 and 59. If not, set them to 0.

  - `Time(const Time& other);`
    Inline Copy constructor, initializes a new `Time` object as a copy of an existing one.

  - `Time operator+ (const Time& other) const;`
    Adds two `Time` objects and returns a new `Time` object.
    You need to normalize the time accordingly. For example, 75 seconds become 1 minute and 15 seconds.

  - `bool isEqual(const Time& other) const;`
    Checks if two `Time` objects are same, i.e, seconds == seconds, minutes == minutes, and hours == hours. Returns true if yes.

  - `friend ostream &operator<<(ostream &output, const Time& other)`
    Prints the `seconds:minutes:hours` of the given Time object

In main(),

1. Create 2 objects of class Time: `Time t1(10, 45, 30), t2(02, 20, 50)`
2. Print the values of two objects
3. Do `Time sum = t1 + t2,` and print `sum`
4. Check if `t1` is equal to `t2` using `isEqual()`
5. Create a copy of `t1` using the copy constructor. Print the copied object.

Code in a single file.
Please document all the functions.
Follow proper coding standards (indentations, variable names).

Sample Output

```
First time: 10:45:30
Second time: 02:20:50

Sum of times: 13:06:20

Are the two times equal? No

Creating a copy of the first time...
Copy constructor called!
Copied time: 10:45:30
```

Gitlab Cloning Instructions

- Open the browser and go to https://git-classes.mst.edu/. Click on the Lab12 repository named *2024-FS-303-lab12-<your_username>*
- Click on 'Clone' button and copy the HTTPS link.
- Open Putty and
  - Change the directory to SDRIVE: `cd SDRIVE`
  - Clone the repository: `git clone <copy_the_HTTPS_link_here>`
  - Change the directory to cloned repository: `cd 2024-FS-303-lab1<your_username>`
- Start coding by opening a new file in nano: `nano main.cpp`

Compiling Instructions

- To run your code, `fg++ main.cpp`
- To get the output, `./a.out`

Submission Instructions

Push your code to your gitlab account.

- Add all your files to the repository, `git add .`
- Commit your changes, `git commit -m "<your_message_goes_here>"`
- Push the changes, `git push`