

**Students:**

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## 21.1 Question 1 (5 marks)

In this exercise you will complete a `Time` class. Details given below. You are provided with the following files:

- `main.cpp` for use when developing your code (not used to test it)
- `task.h` read only header file
- `task.cpp` you will write your c++ assessed code in this file

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### Time Class Details

Write the definitions for the `Time` class in `task.cpp`. Complete the following constructors to initialise the class.

- Default constructor `Time()` that initialises the following private data members:
  - `hours`, `minutes` and `seconds` all to 0
- Second (overloaded) constructor `Time(int h, int m, int s)` that
  - has 3 parameters: `h`, `m` and `s`
  - the parameters should be used to initialise the corresponding private data members

### Member Functions

- Getters:
  - `GetHours()` that returns the `hours`
  - `GetMinutes()` that returns the `minutes`
  - `GetSeconds()` that returns the `seconds`
- `void Time::TimeDifference(const Time& end, const Time& start)`  
This function
  - computes the difference between two given times, referred to as `end` and `start`, and updates the current object (`this`) with the calculated `hours`, `minutes`, and `seconds`. (you can assume `start` is always before `end`)
  - your function will need to handle cases where *borrowing* is required (e.g., when the `seconds` or `minutes` difference is negative): i.e. *borrow* 1 unit from the higher component (e.g., 1 minute from `minutes` or 1 hour from `hours`) to resolve the negative value and then adjust the affected components accordingly

## Example

For the following:

```
Time start(02, 55, 10); // Start time: 02:55:10
Time end(04, 15, 50);   // End time: 04:15:50
Time difference;
difference.TimeDifference(end, start);
std::cout << "Difference: " << difference.GetHours() << ":"
    << difference.GetMinutes() << ":"
    << difference.GetSeconds() << std::endl;
```

the output should be:

```
Difference: 1:20:40
```

**NOTE** in this example, *borrowing* is required from hours as the minutes difference is negative

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LAB  
ACTIVITY

21.1.1: Question 1 (5 marks)

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File is marked as read only

Current file: task.h

main.cpp

task.h

task.cpp

```
1 #ifndef TASK_H
2 #define TASK_H
3
4 #include <string>
5
6 #include <iostream>
7 #include <iomanip>
8 #include <sstream>
9
10 class Time {
11     private:
12         int hours;
13         int minutes;
14         int seconds;
15
16     public:
17         Time();
18         Time(int h, int m, int s);
```

Develop mode

Submit mode

Run your program as often as you'd like, before submitting for grading. Below, type any needed input values in the first box, then click **Run program** and observe the program's output in the second box.

Enter program input (optional)

If your code requires input values, provide them here.

**Run program**

Input (from above)



**main.cpp**  
(Your program)



Program output displayed here

Coding trail of your work [What is this?](#)

History of your effort will appear here once you begin working on this zyLab.

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