

Script started on 2020-11-10 21:30:55-0600

```
m_sadafl@ares:~$ pwd
/home/students/m_sadafl
m_sadafl@ares:~$ cat time.info
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Class: CSC121 W01
```

Lab: The times they are a' Changin'...
Level: 3.5

Description:

This program reads the two times entered by the user and tells the difference of those times including in hours and minutes.

```
m_sadafl@ares:~$ cat time.tpq
Thought Provoking Questions:
```

1) To get the '0' to print automatically, I divided minutes by 60.0 instead of 60.

2) I have 4 functions in this program: double tomin, short tohr, int difference, and int main.

Double tomin returns min and it is used to calculate the hr and the min values. In this function, first hr is multiplied by 60 and the added to the min value.

Short tohr returns hr and calculates it by dividing min by 60.

Int difference returns diff. Minutes1 and minutes 2 is declared and is calculated using abs from cstdlib. This function subtracts both the times and outputs the difference.

Int main returns 0 and is used to take the input from the user and output the difference in using the strings. It also contains the loop to print random message at the end of every run.

3)

4)

5) I used print_msg to print a random message at the end of every run. I had 2 random messages to print so I used rand % 2 + 1 along with the if else loop and == condition to print the messages randomly.

```
m_sadafl@ares:~$ cat time.cpp
```

```
#include <iostream>
#include <cstdlib>
#include <ctime>
#include <string>
```

```
using namespace std;
```

```
double tomin(short hr, short min)
```

```
{
    hr = static_cast<short>(hr * 60);
    min = static_cast<short>(hr + min);

    return min;
}
```

```
short tohr(short min)
```

```
{
    short hr;
    hr = static_cast<short>(min / 60);

    return hr;
}
```

```
int difference(short minutes1, short minutes2)
```

```
{
    short diff;
    diff = static_cast<short>(abs(minutes1 - minutes2));
    diff = static_cast<short>(diff - 1);

    return diff;
}
```

```

int main (void)
{
    srand(static_cast<unsigned>(time(nullptr)));
    short hr1, hr2, min1, min2, minutes1,
           minutes2, diff, print_msg;
    double hours, minutes;
    string msg;
    char t;

    cout<< "\t\t\tWelcome to Time Calculation Program!!!\n";

    cout<< "\nWhat is your first time? ";
    cin>> hr1 >> t >> min1;

    cout<< "\nWhat is your second time? ";
    cin>> hr2 >> t >> min2;

    minutes1 = static_cast<short>(tomin(hr1, min1));
    minutes2 = static_cast<short>(tomin(hr2, min2));

    diff = static_cast<short>(difference(minutes1, minutes2));

    hours = tohr(diff);
    minutes = static_cast<int>(diff % 60);

    cout<< "\nThere are " << diff <<
           " minutes between the two times ("
           << diff + 2 << " inclusive).\n";

    cout<< "\nThat's the same as " << hours <<
           " hours and " << minutes << " minutes (or "
           << hours << ":" << minutes + 2 << " inclusive).\n";

    cout<< "\nOh... and that's also "
           << hours + (minutes / 60.0) << " hours (or "
           << hours + ((minutes + 2) / 60.0) <<
           " inclusive).\n";

    cout<< "\nThank you for using the TCP!!\n";

    print_msg = static_cast<short>(rand() % 2 + 1);

```

```

    if (1 == print_msg)
    {
        msg = "turbulent";
    }
    else
    {
        msg = "ebullient";
    }
    cout<< "\nEndeavor to have a " << msg << " day!\n";

    return 0;
}
m_sadaf1@ares:~$ CPP time
time.cpp***

m_sadaf1@ares:~$ ./time.out
Welcome to Time Calculation Program!!!

What is your first time? 12:40

What is your second time? 18:24

There are 343 minutes between the two times (345 inclusive).
That's the same as 5 hours and 43 minutes (or 5:45 inclusive).
Oh... and that's also 5.71667 hours (or 5.75 inclusive).

Thank you for using the TCP!!

Endeavor to have a ebullient day!
m_sadaf1@ares:~$
m_sadaf1@ares:~$ ./time.out
Welcome to Time Calculation Program!!!

What is your first time? 13:20

What is your second time? 18:24

```

There are 303 minutes between the two times (305 inclusive).
That's the same as 5 hours and 3 minutes (or 5:5 inclusive).
Oh... and that's also 5.05 hours (or 5.08333 inclusive).
Thank you for using the TCP!!

Endeavor to have a ebullient day!
m_sadafl@ares:~\$
m_sadafl@ares:~\$./time.out
Welcome to Time Calculation Program!!!

What is your first time? 18:24
What is your second time? 13:20
There are 303 minutes between the two times (305 inclusive).
That's the same as 5 hours and 3 minutes (or 5:5 inclusive).
Oh... and that's also 5.05 hours (or 5.08333 inclusive).
Thank you for using the TCP!!

Endeavor to have a turbulent day!
m_sadafl@ares:~\$
m_sadafl@ares:~\$./time.out
Welcome to Time Calculation Program!!!

What is your first time? 10:02
What is your second time? 8:20
There are 101 minutes between the two times (103 inclusive).
That's the same as 1 hours and 41 minutes (or 1:43 inclusive).
Oh... and that's also 1.68333 hours (or 1.71667 inclusive).
Thank you for using the TCP!!

Endeavor to have a ebullient day!
m_sadafl@ares:~\$ exit
exit

Script done on 2020-11-10 22:02:45-0600