```
Script started on 2020-12-18 15:02:42-0600
m_sadaf1@ares:~$ pwd
/home/students/m_sadaf1
m_sadaf1@ares:~$ cat timer.info
Name: Madiha Sadaf
Class: CSC121 W01

Lab: 1 Mississippi, 2 Mississippi, 3...
Option: Applied inline and const-ness to class methods.

Level: 3
Level: +2
Total Level: 5

Description:

This program calculates and displays the time elapsed,
difference between the two time's elapsed and the total
between the two time's elapsed.

m_sadaf1@ares:~$ cat timer.tpq
Thought Provoking Questions:

1) 3 data members. Long. It's declared in class, in private.

2) 2 constructors. The first one is a default constructor
and the second one is in the main() which is called
automatically when the object is created.

3) Yes, it is ok.

4) Yes, it is ok.

5) No, because it doesn't work and it's not required
for this program.

6) Yes, the add() changes the value as it adds up both the
elapsed time and prints it. No, it should not change the
other Timer object. This extends to subtraction() too.

7) The input method is not a good/reasonable idea for the
Timer class because classes are not mean't to have cout's,
but to hold data members and member functions.

8) Becasue there is no data to edit.

9)

Option(s)

1) Yes.

2) No because it's not required.

3) Yes, it does alter. By calling the default constructor.

4) Member initialization list; objects that are specified.
No, there is no certain order. It goes on the prototype.

m_sadaf1@ares:~$ cat timer.cpp
#include <iostream>
#include <ctime>

using namespace std;

class Timer
{
    private:
            time_t start_time, stop_time;
            bool running;

    public:

            void output(void)const
            {
                if(running)
                {
                    cout<< elapsed() << " seconds.\n";
                }
            }


            Timer(void):              // constructor
                    start_time{-1},  // member initialization list
                    stop_time{},
                    running{}
            {
            }

            void start()
            {
                start_time = time(nullptr);
                running = true;
            }

            void stop()
            {
                if(running)
                {
                    stop_time = time(nullptr);
                    running = false;
                }

            }
```

```
            long elapsed()const
            {
                long ans;
                if(start_time == -1)
                {
                ans = 0;    //ans can also be set to -1
                }
                else
                {
                    if(running)
                    {
                        ans = time(nullptr) - start_time;
                    }
                    else
                    {
                        ans = stop_time - start_time;
                    }
                }
                return ans;
            }

            long subtract(const Timer & two)const
            {
                return elapsed() - two.elapsed();
            }

            long add(const Timer & two)const
            {
                return elapsed() + two.elapsed();
            }
};

inline void out(const Timer & two)
{
    cout<< "\nThe time is \n";
    two.output();
    cout<< "\nThe time elapsed is " << two.elapsed() << ".\n";
    return;
}

int main(void)
{
    Timer a,b;
    char yes_no;

    cout<< "\t\t\tWelcome to the Timer Program!!!\n";

    a.start();
    do
    {
        cout<< "\nWould you like to start the timer? ";
        cin>> yes_no;
        cin.ignore(numeric_limits<streamsize>::max(),
                '\n');

        }while(tolower(yes_no) == 'n');
        a.stop();
        out(a);

        b.start();

    do
    {
        cout<< "\nWould you like to know the difference"
                " and the total of time elapsed? ";
        cin>> yes_no;
        cin.ignore(numeric_limits<streamsize>::max(),
                '\n');
        }while(tolower(yes_no) == 'n');
        cout<< b.subtract(a)<<'\n';
        out(b);
        cout<< "\nThe total of both elapsed time is: ";
        cout<< a.add(b)<< '\n';

    return 0;
}
```

```
m_sadaf1@ares:~$ CPP timer
timer.cpp***


m_sadaf1@ares:~$ ./timer.out
                        Welcome to the Timer Program!!!

Would you like to start the timer? yes

The time is

The time elapsed is 2.

Would you like to know the difference and the total of time elapsed? yes
```

```
-1

The time is
1 seconds.

The time elapsed is 1.

The total of both elapsed time is: 3
m_sadaf1@ares:~$
m_sadaf1@ares:~$ ./timer.out
                        Welcome to the Timer Program!!!

Would you like to start the timer? no

Would you like to start the timer? n

Would you like to start the timer? y

The time is

The time elapsed is 4.

Would you like to know the difference and the total of time elapsed? no

Would you like to know the difference and the total of time elapsed? y
-1

The time is
3 seconds.

The time elapsed is 3.

The total of both elapsed time is: 7
m_sadaf1@ares:~$
m_sadaf1@ares:~$ ./timer.out
                        Welcome to the Timer Program!!!

Would you like to start the timer? yup

The time is

The time elapsed is 4.

Would you like to know the difference and the total of time elapsed? you got it!
9

The time is
13 seconds.

The time elapsed is 13.

The total of both elapsed time is: 17
m_sadaf1@ares:~$ exit
exit

Script done on 2020-12-18 15:03:51-0600
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