

[Assignment 2 & 20152008, Kusdavletov Ernar]

[OOP]Assign2

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1. Descriptions

The main function of the program is to read all inputs and show the longest possible time for nap for the professor. If there are several longest naps with same duration, then it outputs the earliest one.

Firstly, the program get the number of appointments that the professor has in one day. Then, reads all appointments, store them in array and sort them by starting time. Then, compares the previous appointment's ending time with present appointment's starting time and find the difference. By doing so the program finds the longest possible time for nap and outputs the starting time of the nap and duration.

Also, the program works even if there is overlapping appointments, if the appointments arranged randomly by time and if the starting and ending time located not at the beginning of the line.

2. Code

```
//Kusdavletov Ernar
#include <iostream>
using namespace std;

int main(){
    int appointments_number; //number of appointments if one day
    int day = 1; //days counter
    while (cin >> appointments_number){ //while we have some input of number of appointments
        int minutes[appointments_number + 2][2], hours; //array is to store the values, hours is the read the input
        char useless; //just for reading useless things, such as ':'
        string trash; //the useless part of the line with information of activity
        minutes[0][1] = 10 * 60; //the day begins at 10 am
        minutes[appointments_number + 1][0] = 18 * 60; //and ends at 6 pm
        for (int i = 1; i < appointments_number + 1; i++){ //reading the lines and getting the input
            while (true){
                cin >> useless;
                if (useless == '1'){
                    break;
                }
            }
            cin >> hours >> useless >> minutes[i][0];
            minutes[i][0] += (hours + 10) * 60; //storing all information in array
            cin >> hours >> useless >> minutes[i][1];
            minutes[i][1] += hours * 60; //storing all information in array
            getline(cin, trash); //reading the rest trash
        }
        for (int i = 1; i < appointments_number + 1; i++){ //sorting the appointments by starting time
            for (int j = i + 1; j < appointments_number + 1; j++){
```

```

        if (minutes[i][0] > minutes[j][0]){
            int temp;
            temp = minutes[i][0];
            minutes[i][0] = minutes[j][0];
            minutes[j][0] = temp;
            temp = minutes[i][1];
            minutes[i][1] = minutes[j][1];
            minutes[j][1] = temp;
        }
    }
}

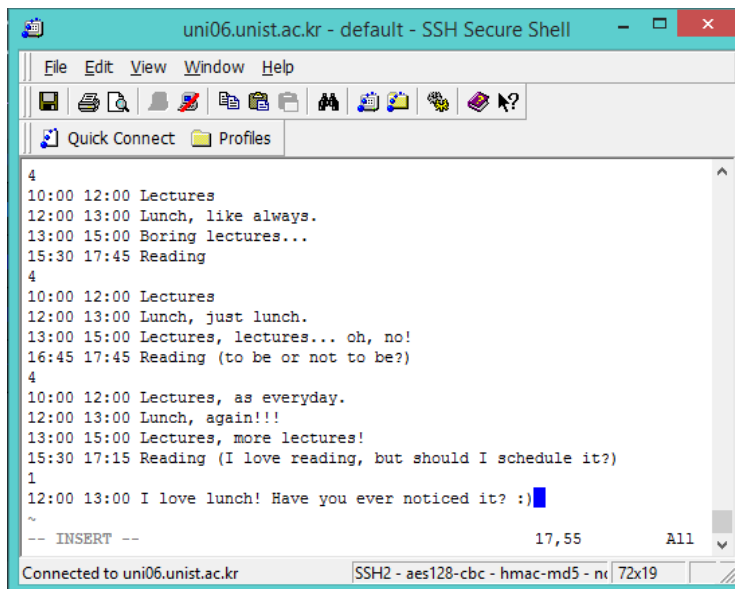
int longest_nap = 0, start_nap = 0, biggest_end = minutes[0][1]; //variables for finding the nap time
for (int i = 1; i < appointments_number + 2; i++){ //finding the longest nap and starting time
    if ((minutes[i][0] - biggest_end) > longest_nap){
        longest_nap = minutes[i][0] - biggest_end;
        start_nap = biggest_end;
    }
    if (minutes[i][1] > biggest_end){
        biggest_end = minutes[i][1];
    }
}

//printing output
cout << "Day #" << day << ": the longest nap starts at " << (start_nap / 60) << ":";
if ((start_nap % 60) < 10){ //if time is less than 10, add additional 0
    cout << 0;
}
cout << (start_nap % 60);
cout << " and will last for ";
if ((longest_nap / 60) > 0){ //if nap is more than or equal to 60 minutes, print hours
    cout << (longest_nap / 60) << " hours and ";
}
cout << (longest_nap % 60) << " minutes." << endl; //printing minutes
day += 1; //days counter + 1
}
return 0;
}

```

3. Sample input

First sample input

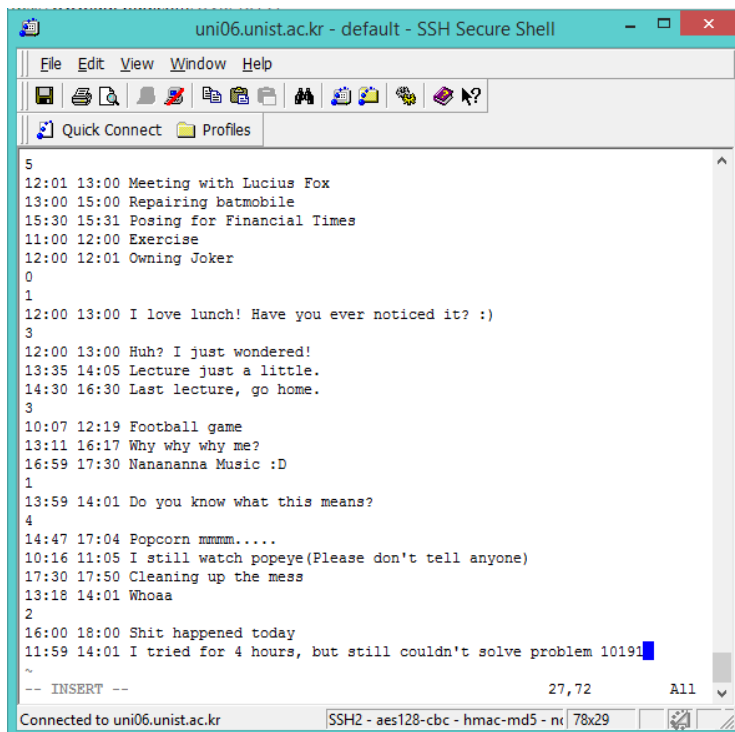


The screenshot shows an SSH Secure Shell window titled "uni06.unist.ac.kr - default - SSH Secure Shell". The window has a menu bar (File, Edit, View, Window, Help) and a toolbar with various icons. Below the toolbar is a "Quick Connect" button and a "Profiles" folder icon. The main text area displays the following text:

```
4
10:00 12:00 Lectures
12:00 13:00 Lunch, like always.
13:00 15:00 Boring lectures...
15:30 17:45 Reading
4
10:00 12:00 Lectures
12:00 13:00 Lunch, just lunch.
13:00 15:00 Lectures, lectures... oh, no!
16:45 17:45 Reading (to be or not to be?)
4
10:00 12:00 Lectures, as everyday.
12:00 13:00 Lunch, again!!!
13:00 15:00 Lectures, more lectures!
15:30 17:15 Reading (I love reading, but should I schedule it?)
1
12:00 13:00 I love lunch! Have you ever noticed it? :)
~
-- INSERT --
```

The status bar at the bottom indicates "Connected to uni06.unist.ac.kr" and "SSH2 - aes128-cbc - hmac-md5 - n". The window size is 72x19.

Second sample input



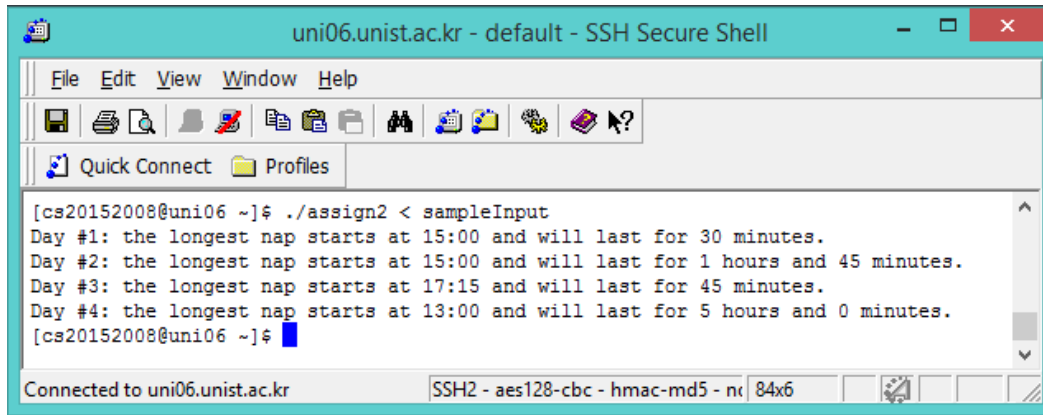
The screenshot shows an SSH Secure Shell window titled "uni06.unist.ac.kr - default - SSH Secure Shell". The window has a menu bar (File, Edit, View, Window, Help) and a toolbar with various icons. Below the toolbar is a "Quick Connect" button and a "Profiles" folder icon. The main text area displays the following text:

```
5
12:01 13:00 Meeting with Lucius Fox
13:00 15:00 Repairing batmobile
15:30 15:31 Posing for Financial Times
11:00 12:00 Exercise
12:00 12:01 Owning Joker
0
1
12:00 13:00 I love lunch! Have you ever noticed it? :)
3
12:00 13:00 Huh? I just wondered!
13:35 14:05 Lecture just a little.
14:30 16:30 Last lecture, go home.
3
10:07 12:19 Football game
13:11 16:17 Why why why me?
16:59 17:30 Nanananna Music :D
1
13:59 14:01 Do you know what this means?
4
14:47 17:04 Popcorn mmmmm.....
10:16 11:05 I still watch popeye(Please don't tell anyone)
17:30 17:50 Cleaning up the mess
13:18 14:01 Whoaa
2
16:00 18:00 Shit happened today
11:59 14:01 I tried for 4 hours, but still couldn't solve problem 10191
~
-- INSERT --
```

The status bar at the bottom indicates "Connected to uni06.unist.ac.kr" and "SSH2 - aes128-cbc - hmac-md5 - n". The window size is 78x29.

4. Sample output

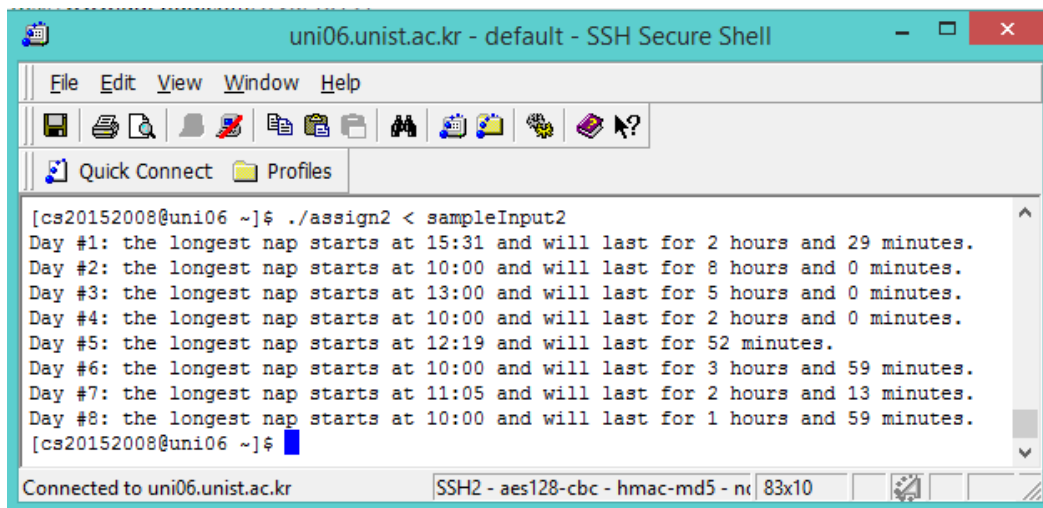
First sample output



The screenshot shows an SSH terminal window titled "uni06.unist.ac.kr - default - SSH Secure Shell". The terminal displays the output of the command `./assign2 < sampleInput`. The output lists the longest nap for four days, each with a start time and duration. The terminal status bar at the bottom indicates the connection is to uni06.unist.ac.kr using SSH2 with aes128-cbc - hmac-md5 - n, and the window size is 84x6.

```
[cs20152008@uni06 ~]$ ./assign2 < sampleInput
Day #1: the longest nap starts at 15:00 and will last for 30 minutes.
Day #2: the longest nap starts at 15:00 and will last for 1 hours and 45 minutes.
Day #3: the longest nap starts at 17:15 and will last for 45 minutes.
Day #4: the longest nap starts at 13:00 and will last for 5 hours and 0 minutes.
[cs20152008@uni06 ~]$
```

Second sample output



The screenshot shows an SSH terminal window titled "uni06.unist.ac.kr - default - SSH Secure Shell". The terminal displays the output of the command `./assign2 < sampleInput2`. The output lists the longest nap for eight days, each with a start time and duration. The terminal status bar at the bottom indicates the connection is to uni06.unist.ac.kr using SSH2 with aes128-cbc - hmac-md5 - n, and the window size is 83x10.

```
[cs20152008@uni06 ~]$ ./assign2 < sampleInput2
Day #1: the longest nap starts at 15:31 and will last for 2 hours and 29 minutes.
Day #2: the longest nap starts at 10:00 and will last for 8 hours and 0 minutes.
Day #3: the longest nap starts at 13:00 and will last for 5 hours and 0 minutes.
Day #4: the longest nap starts at 10:00 and will last for 2 hours and 0 minutes.
Day #5: the longest nap starts at 12:19 and will last for 52 minutes.
Day #6: the longest nap starts at 10:00 and will last for 3 hours and 59 minutes.
Day #7: the longest nap starts at 11:05 and will last for 2 hours and 13 minutes.
Day #8: the longest nap starts at 10:00 and will last for 1 hours and 59 minutes.
[cs20152008@uni06 ~]$
```