

# Homework #1

정보컴퓨터공학부

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## 1. Put your program source as here

```
<digitalclock.h>
```

```
#ifndef _DIGITALCLOCK_H
```

```
#define _DIGITALCLOCK_H
```

```
// Declare variables for date, time and functions
```

```
#include <stdio.h>
```

```
#include <time.h>
```

```
#include <pthread.h>
```

```
#include <ncurses.h>
```

```
#include <unistd.h>
```

```
time_t now;
```

```
struct tm t;
```

```
void *showdate(void *ptr);
```

```
void *showtime(void *ptr);
```

```
void *showelapsedtime(void *ptr);
```

```
#endif
```

```
<localdate.c>
```

```
#include "digitalclock.h"
```

```
void *showdate(void *ptr){
```

```
    // Declare variable for storing date data
```

```
    char date[50];
```

```
    while(1){
```

```
        time(&now);
```

```

t = *localtime(&now);

//Calculate current time and convert to form that we want
strftime(date, sizeof(date), "%Y-%m-%d", &t);

//Print On Window
mvprintw(1, 2, "Local Date");
mvprintw(3, 2, date);
sleep(1);
}
}

```

#### **<localtime.c>**

```

#include "digitalclock.h"

void *showtime(void *ptr){

//Declare variable for storing current time data
char time_now[50];

while(1){
    time(&now);
    t = *localtime(&now);

//Calculate time and convert to form that we want
strftime(time_now, sizeof(time_now), "%H-%M-%S", &t);

//Print on Window
mvprintw(1, 41, "Local Time");
mvprintw(3, 41, time_now);

sleep(1);
}

}

```

### **<elapsedtime.c>**

```
#include "digitalclock.h"
```

```
void *showelapsedtime(void *ptr){
    //Declare variables for storing hour, minute, second for each
    int hour, minute, second;
    // counting for each second
    int elapsed = 0;

    while(1){
        //Convert elapsed count to each time unit
        second = elapsed % 60;
        minute = (elapsed / 60) % 60;
        hour = elapsed / 3600;

        //Print on Window
        mvprintw(1, 71, "Elapsed Time");
        mvprintw(3, 71, "%02d:%02d:%02d", hour, minute, second);

        sleep(1);
        //Increasing elapsed count
        elapsed++;
    }
}
```

### **<main.c>**

```
#include "digitalclock.h"
```

```
int main(){

    // Declare variables for subwindows and threads
    WINDOW *date_win, *time_win, *elapsed_win;
    pthread_t date_thread, time_thread, elapsed_thread;

    // Initiating window
    initscr();

    // set cursor
```

```

    curs_set(0);

    // Set subwindows' position
    date_win = subwin(stdscr, 5, 40, 0, 0);
    time_win = subwin(stdscr, 5, 30, 0, 40);
    elapsed_win = subwin(stdscr, 5, 30, 0, 70);

    // Set subwindows' borders
    box(date_win, ACS_VLINE, ACS_HLINE);
    box(time_win, ACS_VLINE, ACS_HLINE);
    box(elapsed_win, ACS_VLINE, ACS_HLINE);

    // Create Threads and Run
    date_thread = pthread_create(&date_thread, NULL, showdate, NULL);
    time_thread = pthread_create(&time_thread, NULL, showtime, NULL);
    elapsed_thread = pthread_create(&elapsed_thread, NULL, showelapsedtime, NULL);

    // Refresh each windows
    while(1){
        wrefresh(date_win);
        wrefresh(time_win);
        wrefresh(elapsed_win);
    }

    // After finishing all work, windows are deleted
    delwin(date_win);
    delwin(time_win);
    delwin(elapsed_win);
    endwin();

    return 0;
}

```

2. You must show the building result after compiling and linking your source codes. You must show no warnings and errors.

```
MacBook-Air:unix_assignment YJK$ make
gcc -c -o main.o main.c
main.c:26:17: warning: incompatible integer to pointer conversion assigning to 'pthread_t' (aka
'struct _opaque_pthread_t *') from 'int' [-Wint-conversion]
    date_thread = pthread_create(&date_thread, NULL, showdate, NULL);
                        ^ ~~~~~~
main.c:27:17: warning: incompatible integer to pointer conversion assigning to 'pthread_t' (aka
'struct _opaque_pthread_t *') from 'int' [-Wint-conversion]
    time_thread = pthread_create(&time_thread, NULL, showtime, NULL);
                        ^ ~~~~~~
main.c:28:20: warning: incompatible integer to pointer conversion assigning to 'pthread_t' (aka
'struct _opaque_pthread_t *') from 'int' [-Wint-conversion]
    elapsed_thread = pthread_create(&elapsed_thread, NULL, showelapsedtime, NULL);
                                ^ ~~~~~~
3 warnings generated.
gcc -c -o localdate.o localdate.c
gcc -c -o localtime.o localtime.c
gcc -c -o elapsedtime.o elapsedtime.c
gcc -o digitalclock main.o localdate.o localtime.o elapsedtime.o -lcurses -lpthread
```

I am sorry, I cannot find the reason

3. Put a screen shot of output generated by your program as well as the Ubuntu system's clock to verify if your clock is working correctly or not

