Ödev 1 dosya

CMP3006

Embedded Systems Programming

Spring 2020 Term Project

Due date: 7th of June 2020, 23:59

Introduction

In this project you are expected to build a **digital alarm clock** using an Arduino microcontroller. The clock will have different functionalities implemented in it, like showing the temperature, switching between 12H and 24H modes, setting up the values for current time and alarm time, etc. via the use of buttons.

Submission Details

This is NOT a group project; therefore, you will submit the projects individually. Provide everything mentioned below in your submission .zip file:

1. Short video demonstration of your project
2. Your code (.txt, .ino or .cpp)
3. Report explaining your circuit and code (max. 2 pages)

*If you are using Tinkercad, please also share your circuit link.

The deadline is 7th of June, until midnight.

Name the .zip file as “Name_Surname_StudentNumber”

Submissions will be from itsLearning

Project Details

It is possible to do the whole project solely on **Tinkercad**, but for those who prefer to use **Proteus** can also use it. *(One advantage of Proteus is having more options to choose from for most components.)*

You are NOT restricted to using register operations, you can use any kind of code including libraries for components *(i.e. LiquidCrystal.h).* But YOU MUST USE TIMER for timing. Do not use **delay** function for timing.

Requirements

- LCD screen which is showing:

    1-Current time *(Switchable between “00:00-24:00” and “00-12 AM/PM”)*

    2-Alarm time *(with a symbol indicating ON/OFF)*

    3-Temperature *(Switchable between Celsius and Fahrenheit)*

-4 Buttons which are used for:

    B1-Switching between modes in current time

  (Hold 3 seconds for current time setup)

    B2-Setting the alarm ON and OFF

      (Hold 3 seconds for alarm time setup)

B3-Switching between temperature scales (Fahrenheit /Celcius)

  (During a value setup, this button acts as “raise value ^”)

    B4-Snooze button

      (Temporarily stops alarm for only 5 minutes)

- Piezo buzzer for the alarm sound

- Potentiometer for changing backlight brightness

- Temperature sensor for detecting temperature

- You must use TIMERS for timing (i.e. do not use delay function to update seconds)

To see which value is being set at a given time, the time value which is being set will blink.

Here is an example setup scenario of setting up alarm time:

Alarm Set Up

1-Hold B2 for 3 seconds to start setup *alarm minute will blink*

2-Use B3 to adjust alarm minute

3-Press B2 once to switch to hour *alarm hour will blink*

4-Use B3 to adjust alarm hour

5-Press B2 again to end setup *nothing will blink*

Clock Set Up

1-Hold B1 for 3 seconds to start setup *clockminute will blink*

2-Use B3 to adjust alarm minute

3-Press B1 once to switch to hour *clock hour will blink*

4-Use B3 to adjust alarm hour

5-Press B1 again to end setup *nothing will blink*

As a reference, you can check out the user manual for IKEA's Tjenis alarm clock.

https://www.ikea.com/us/en/manuals/filmis-clock-thermometer-alarm__AA-1255535-1.pdf

(**WARNING!** The requirements of the project are different from what is shown here, this is shared just to give you an idea)

Grading

-You will be graded on how loyal your project is to the requirements given. ---Clean and proper code will also affect your grade positively as a bonus.

-The total percentage of this project to your final grade is 30% as mentioned in the grading policy.

Cheating Policy

Cheating is strictly prohibited. Everything must be your own work, do not use each other's source code. If cheating is confirmed all students involved will be penalized heavily.

Important: itsLearning has built-in plagiarism control that automatically detects submitted material that is plagiarised.

GOOD LUCK!

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