SE101 Project Proposal

Students: Anish: apangark Jayden: jk2999la Shisheer: s28choud

GitHub: https://git.uwaterloo.ca/se101-f17/se101-f17-group-36

Idea

We want to create a smart clock which would include multiple functionalities. Possible features include date and time, alarm (with a snooze feature), stopwatch/timer, reminder (ie. calendar that reminds you of important events) and a weather forecaster/temperature gauge. The alarm itself will have a “Snooze Alarm” function, but will also include a “Stop Alarm” function which can be activated only after solving a graphical puzzle. Since this design is variable and flexible, depending on time and difficulty constraints, we can add more applications later to make this device similar to a smartphone with custom apps.

Software Components

Integrated Development Environment (IDE): Arduino IDE 1.8.5 **Language**: C Language

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Experimental Prototype

We do not plan to modify our Arduino very much, simply attach the LCD shield, a sound buzzer and a DS3231 add-on, which will track time and measure temperature. However, we plan to code the Arduino and the add-on (DS3231) mainly with a time keeping function which will be applied for the clock/timer and implement weather detection which will include a temperature gauging function.
(image courtesy of https://hobbystore.com.my/image/cache/data/aduino-uno-r3-52-800x800.jpg)

Hardware Components

Circuit Board: Arduino Uno R3 **Shield**: LCD Shield, Sound Buzzer, DS3231

Potential Challenges

Lack of experience

Our group does not have much experience with Arduino boards and programming and will have to learn how to make our programs work along with a busy Software Engineering schedule.

Hardware breakdown

We decided to purchase a cheaper Arduino alternative which is not directly from the Arduino company. So, we need to be careful with programming the software and take care of our circuit board and shield to avoid hardware malfunction or deterioration.

Timing

From past high school experiences, we have found that timing with a circuit boards and its internal ticks (ie. making a clock based on the internal ticks of the Arduino) is a challenge and requires fine tuning in order to properly tell time and count seconds and minutes.

Weather Data

If our device will tell the weather or future weather forecast, we will have to include a shield with a thermometer device. Again, with the lack of experience, we will have to do extensive research in order to make this function happen.