Clock

EE24BTECH11027 - satwikagv

Objective

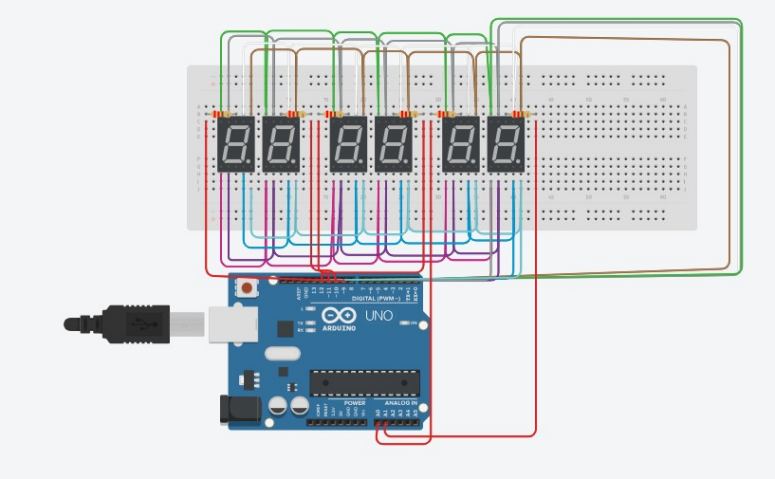
The aim of this project is to build a digital clock using a 7-segment display and an Arduino Uno. The display should be able to show time and date, with an option to switch between the two.

Hardware Required

- Arduino uno
- Bread board
- 6 Seven Segment displays (Common anode)
- 6 resistors with 220Ω
- Connecting wires
- OTG

Circuit Design

- The seven segment pins are multiplexed (a-g) and are connected to Arduino uno 2-8 pins in order.
- Common anodes are connected to the pins 9,10,11,12,A0,A1 through the resistors.
- Dot segment is connected to pin 13.



After connecting the circuit upload the following code to the arduino uno. Refer to the file `codes/clock.c`.

Implementation

- **Multiplexing:** Since multiple digits need to be displayed with limited pins, a multiplexing technique is used to switch between digits rapidly.
- **Timing Mechanism:** Implemented using AVR timers to generate 1-second intervals for updating the clock.
- **Digit update logic:**The digits are refreshed periodically to maintain a stable visual output without flickering.

Challenges and Solutions

- **Limited Arduino pins:**Managed by optimizing connections and implementing multiplexing.
- **Accurate timing:**Utilized software counters and hardware timers to maintain precise 1-second intervals

Conclusion

The digital clock successfully displays the current time using a 7-segment display and updates in real-time. The use of multiplexing and AVR timers ensures efficient performance.