

# Microprocessor Techniques and Embedded Systems

PROJECT PRESENTATION

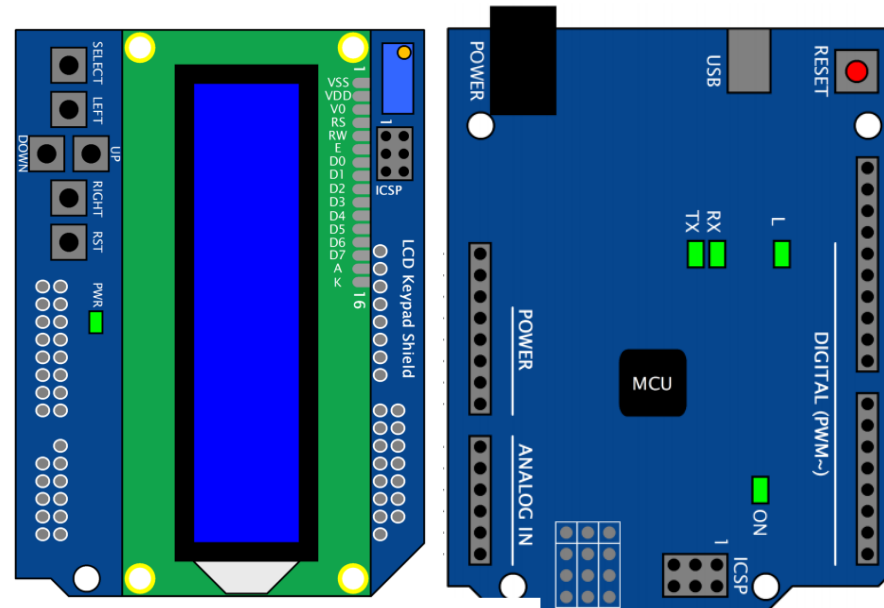
# Project itself

The project goal is to make an application with:

- ▶ Time
- ▶ Date
- ▶ Alarms
- ▶ Chronometer
- ▶ Timer

# Material used

- ▶ Arduino Uno target board with ATmega328/P microcontroller
- ▶ LCD Keypad Shield
- ▶ DS3231 RTC clock



# Material used

## ► DS3231 RTC clock

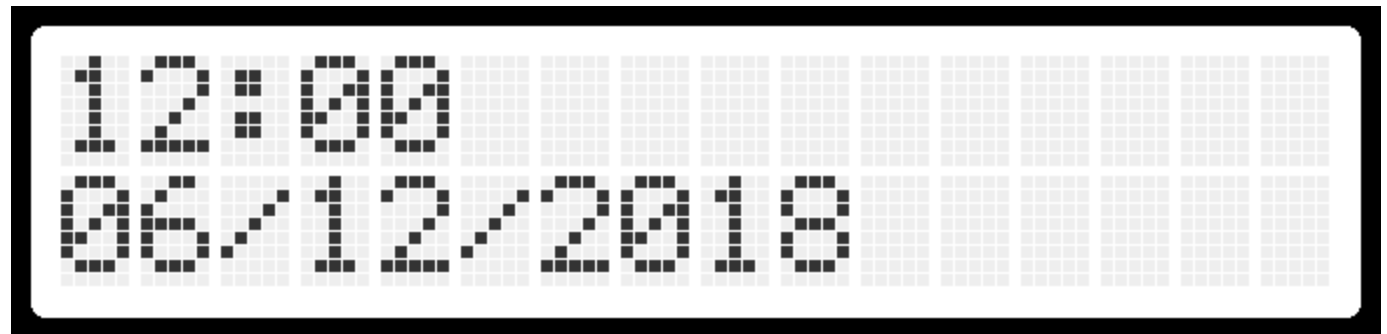
I2C address : 0x68



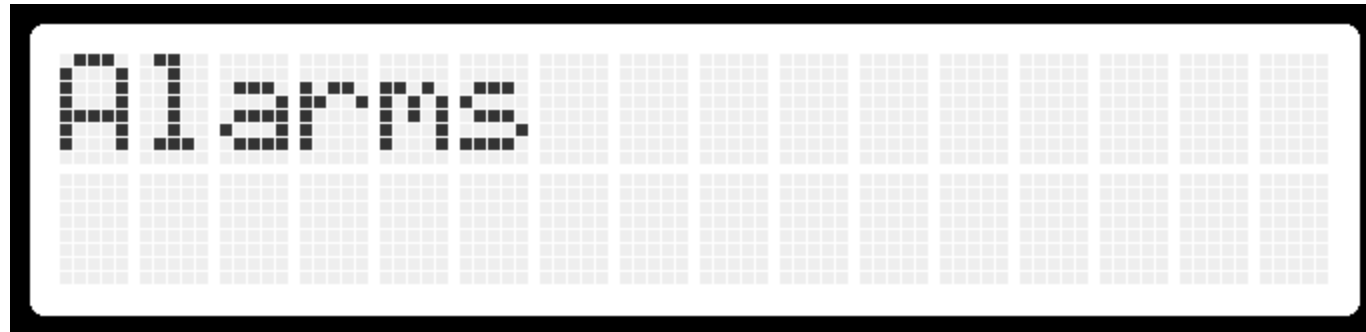
ADDRESS	BIT 7 MSB	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0 LSB	FUNCTION	RANGE
00h	0	10 Seconds			Seconds				Seconds	00–59
01h	0	10 Minutes			Minutes				Minutes	00–59
02h	0	12/24	AM/PM 20 Hour	10 Hour	Hour				Hours	1–12 + AM/PM 00–23
03h	0	0	0	0	0	Day			Day	1–7
04h	0	0	10 Date			Date			Date	01–31
05h	Century	0	0	10 Month	Month				Month/ Century	01–12 + Century
06h	10 Year				Year				Year	00–99
07h	A1M1	10 Seconds			Seconds				Alarm 1 Seconds	00–59
08h	A1M2	10 Minutes			Minutes				Alarm 1 Minutes	00–59
09h	A1M3	12/24	AM/PM 20 Hour	10 Hour	Hour				Alarm 1 Hours	1–12 + AM/PM 00–23
0Ah	A1M4	DY/DT	10 Date			Day			Alarm 1 Day	1–7
						Date			Alarm 1 Date	1–31
0Bh	A2M2	10 Minutes			Minutes				Alarm 2 Minutes	00–59
0Ch	A2M3	12/24	AM/PM 20 Hour	10 Hour	Hour				Alarm 2 Hours	1–12 + AM/PM 00–23
0Dh	A2M4	DY/DT	10 Date			Day			Alarm 2 Day	1–7
						Date			Alarm 2 Date	1–31

# Current state of the project

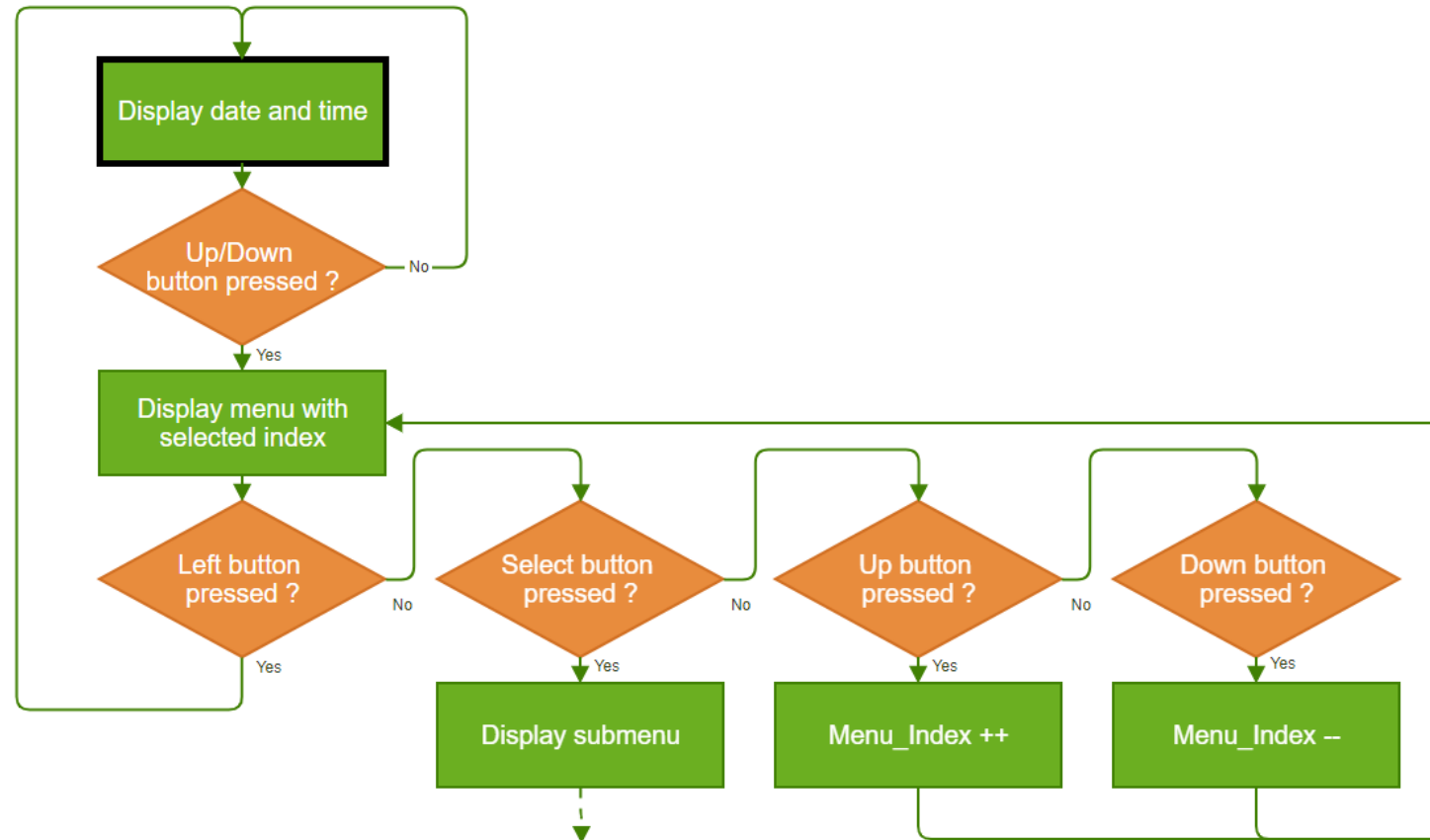
- ▶ Get and display date and time
- ▶ Interactive menu
- ▶ Set time / date



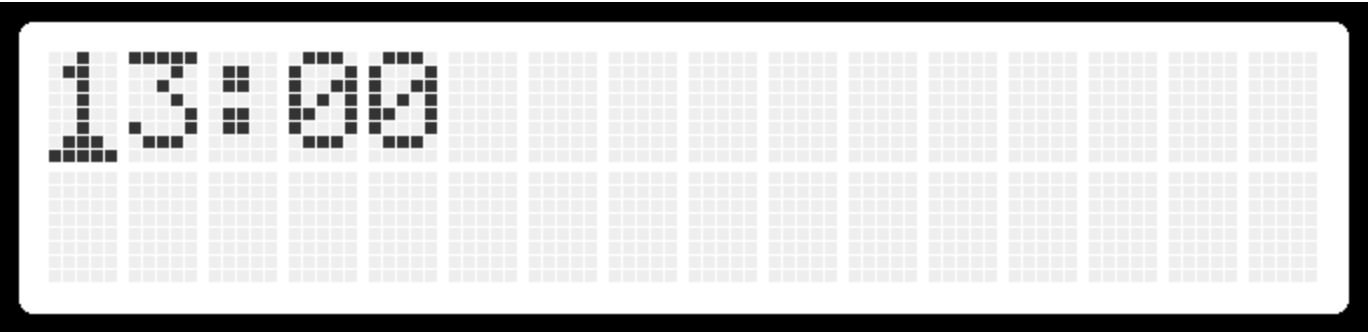
# Interactive menu



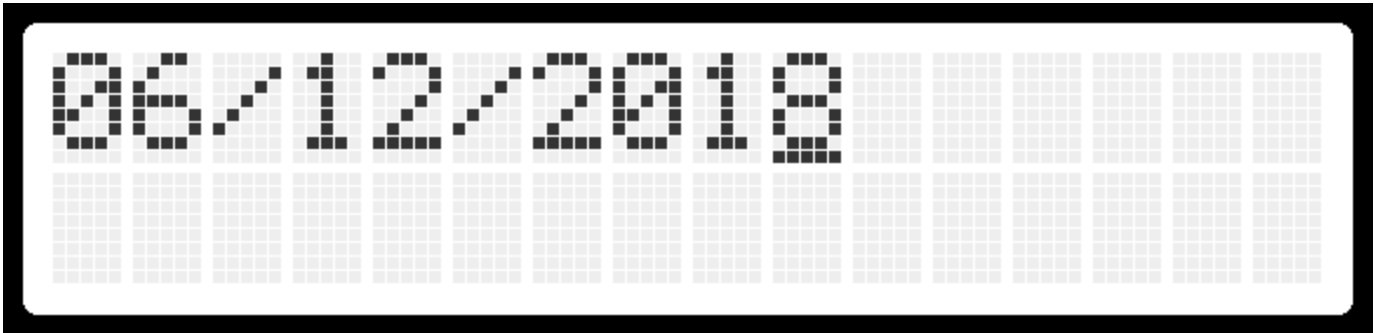
# Interactive menu



# Set time / date



13:00

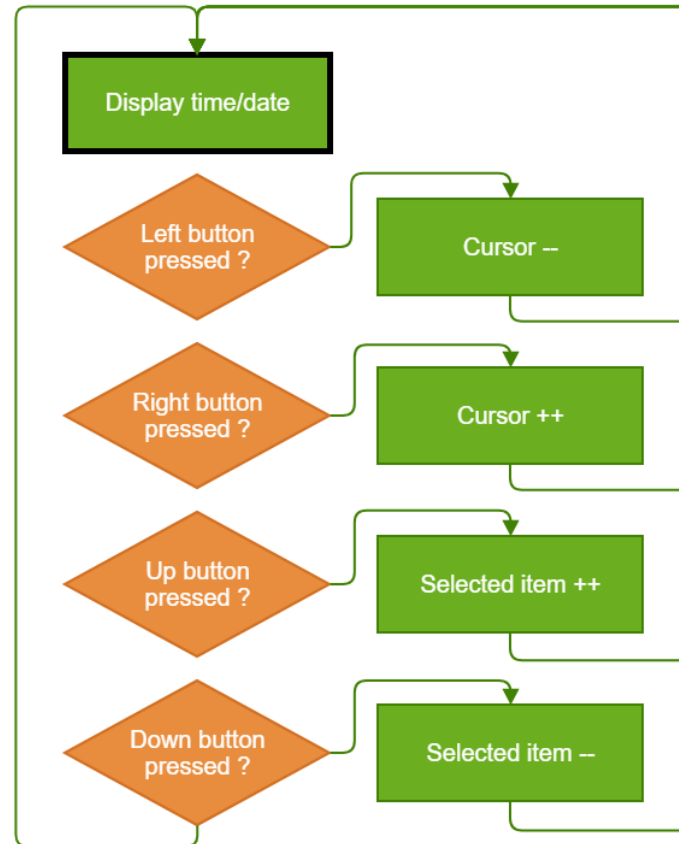
A digital display with a black border and a white background. The display shows the time 13:00 in a pixelated font. The background is divided into a grid of small squares, with the first four columns containing the digits and the rest being empty.

06/12/2018

A digital display with a black border and a white background. The display shows the date 06/12/2018 in a pixelated font. The background is divided into a grid of small squares, with the first six columns containing the date and the rest being empty.



# Set time / date



# Demo

<https://youtu.be/dkUYMvdTPwQ>

# What we would like to do

- ▶ Use EEPROM to store and load date, time and alarms
- ▶ Alarms
- ▶ Chronometer
- ▶ Timer



Thanks for your attention