Project 8.

Design an Arduino Uno microsystem that will control a microwave oven. The operation of the oven is done by means of 5 pushbuttons and a liquid crystal display. The heating time is displayed in the format **mm: ss**. The oven works as follows:

1. At power up, the initial time value is 00:00
2. First, the user sets the heating time. The setting of the heating time is done by means of three pushbuttons: **MIN10**, **MIN** and **SEC10**. The maximum value of this time is 99:50.
3. The heating starts after the user presses the **START** button. During heating, the time previously set decreases until it reaches zero (00:00). When the time reaches zero, the heating stops. For example, if the time value after setting phase is 08:00, in the heating phase it will be displayed as: 08:00 → 07:59 → 07.58 →… 00:03 → 00:02 → 00:01 → 0:00.
4. Heating can be switched off at any time by pressing the **CANCEL** button. Pressing CANCEL causes the time to become zero (00:00). During heating, pressing the MIN10, MIN and SEC10 push buttons does not change the time.

The role of the push buttons MIN10, MIN and SEC10 through which the heating time is set is:

- Pressing the **MIN10** button increments circularly the tens of minutes: … …**7**0:00 → **8**0:00 → **9**0:00 → **0**0:00 → **1**0:00…
- Pressing the **MIN** button circularly increments minutes: …5**8**:00 → 5**9**:00 → 5**0**:00 → 5**1**:00 → 5**2**:00…
- Pressing the **SEC10** button circularly increases the tens of seconds: …10:**3**0 → 10:**4**0 → 10:**5**0 → 10:**0**0…
- Push buttons show instability.

The microsystem generates the **RUN** output which is '1' during heating. The logical value of the RUN will be displayed via an LED.

Specifications and mandatory requirements:

Time management with soft loops such as `for(i=0;i<DELAY;i++){}` or with `delay(...)` function **is not allowed**.

Project content:

The “tinkercad circuits” project that will contain the electrical diagram and the Arduino program.