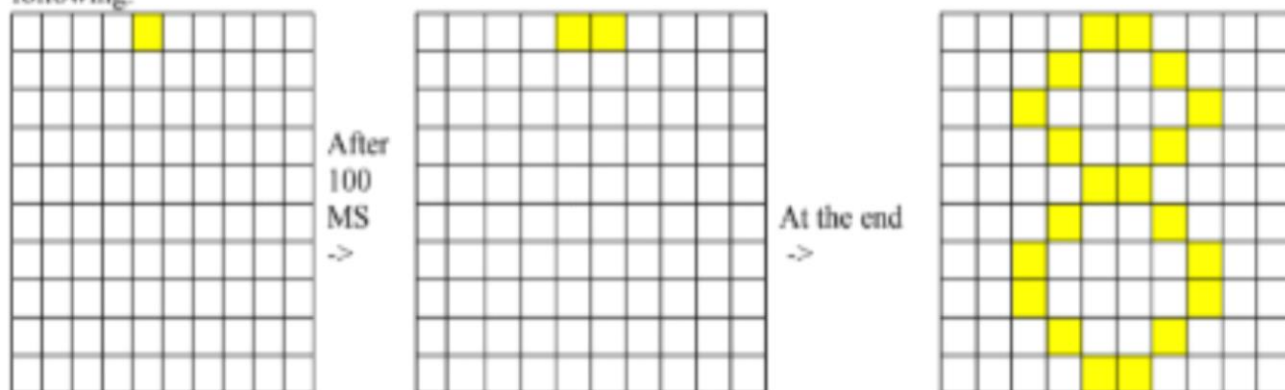## Task 1: Light Panel

It is required to build a 10*10 LEDs grid. This grid is controlled by a 10 keys keypad. The grid functionality as follows:

The grid has two modes:

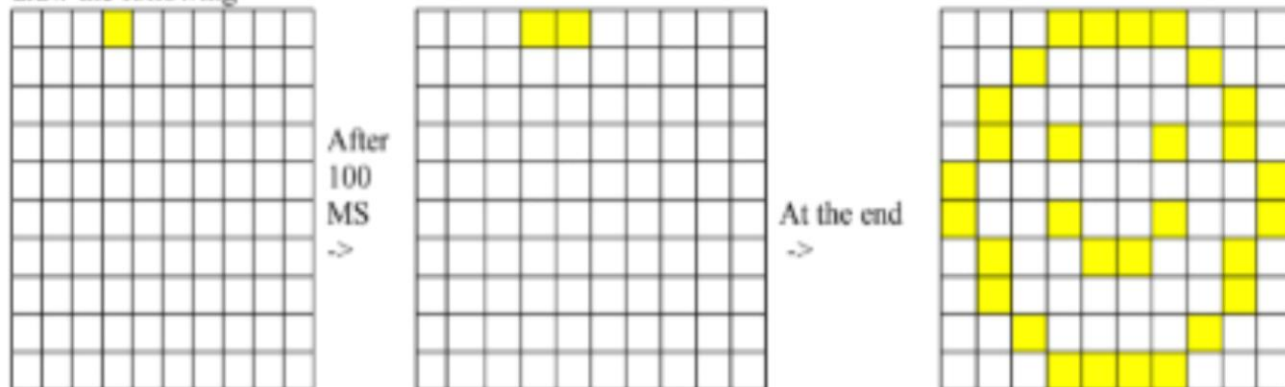   1- Numeric mode

      2- Emotions mode

As the system power on, the LEDs grid starts self-testing by turning on the first column while all other columns turned off. The turning on the second column after 200 millisecond and turning off all other columns including the first one. After finishing all columns, the first row is turned on while all other rows are turned off. Then, the second row is turned on while all other rows are turned off including the first row... etc.

After completing self-testing, the grid is working in the numeric mode. In this mode, if the user pressed any key from 0 – 9 the key is drawn on the led grid using LEDs one by one. Meaning that, the first led will open then the second one after 100 milliseconds and so on. For example, if the user entered 8 then the system will do as the following:

After 100 MS ->

At the end ->

If the user entered the password (which is 1234) the system enters the emotions mode. Each key will activate certain emotion of your choice. Therefore, it is required for to select 10 different emotions.

For example, zero will be reserved for 😊 and 1 for 😞. For example, if the user pressed Zero the system will draw the following

After 100 MS ->

At the end ->

If the user entered the reverse of the password (which is 4321) the system returns to the numeric mode.

The user is able to change password by entering 1212 followed by four keys. For example, if the user entered 12127891 then the password to change mode from numeric mode to emotions mode is 7891 and the password to change mode from emotions mode to numeric mode is 1987.

An "audio out" sound device is connected to the system. It should make a different sound with each key pressed. And a longer sound if password sequence is detected.

While drawing the number or emotion, if the user pressed any other key (other than the one to be drawn) the system should stop drawing the current number/emotion immediately and start in the new one.

You are allowed to use (AND – OR – NAND – NOR – NOT – XOR – XNOR – Resistors) as you wish with any number of inputs

+ 100 LEDs (LED matrix or LED bar are forbidden)

+1 Keypad or 10 keys

+1 Arduino Uno

+1 audio out

[Optional] voltage source

You are not allowed to use any external library.

All "#include lines" in your code or any non-mentioned devices will be deleted automatically before task evaluation

No restrictions on the code size, number of lines or using delay.