

In this lab, you are required to complete one experiment in total.

EXPERIMENT 1:

You are required to create a circuit with an Arduino board, 4 LEDs and a push down button using Arduino Software (IDE).

DO NOT FORGET TO USE RESISTORS TO AVOID BURNING YOUR CIRCUIT COMPONENTS!

After you correctly assemble your circuit using the components mentioned above, you will need to write a source code and use Arduino IDE software to load it into your Arduino Board.

The first operation is counting from 0 to 15 (and returning to 0 to repeat again) using your 4 LEDs. A table showing this operation is given below.

DECIMAL VALUE	BINARY VALUE	LED 4	LED 3	LED 2	LED 1
0	0000				
1	0001				
2	0010				
3	0011				
4	0100				
5	0101				
6	0110				
7	0111				
8	1000				
9	1001				
10	1010				
11	1011				
12	1100				
13	1101				
14	1110				
15	1111				
REPEAT FROM 0					

Your second operation is to create a sliding LED from first to last and back to first again. A table showing this operation is given below.

LED STATE	LED 4	LED 3	LED 2	LED 1
0				
1				
2				
3				
4				
5				
REPEAT FROM 0				

You are required to use global variables with following names and values, to make your program more readable and reliable.

TIME_LED_COUNTER = 500

A variable used to store waiting time between steps in LED counter operation given above. It should be 500 milliseconds to denote 0.5 seconds.

TIME_LED_SLIDER = 250

A variable used to store waiting time between steps in LED slider operation given above. It should be 200 milliseconds to denote 0.2 seconds.

A push down button should be used to change currently executed operation (from LED counter to slider and vice versa). Take care that you should only change it once for every press and not repeatedly. For example, you press the button and it changes from counter to slider. However you keep pressing it and it changes back counter at the next sliding step. Try to figure it out yourself how you can make sure this does not happen. In addition, when you press a push down button and change the current running operation, that operation should start from 0 or initial state, disregarding previously counter or slider state, if there was one.

You are free to use functions as you wish. Please take care to use only English language in your code including variables, functions and comments. In addition, make sure your code is understandable, readable and well structured.

You are also required to make a video that will explain and show the circuit and its operation. The video you are going to make should be at most 5 minutes. Videos uploaded longer than this time limit will have their grade reduced. In addition, please make sure the video quality is good and your circuit and computer screen (when it is required) is clearly visible. You can use Turkish or English in this video, you are free to use either of them.