

Lab 2
EET 472
Introduction to Embedded System
Total Points: 100

Instruction for Online students: Online students should attach a short video of the demonstration. You can post in the YouTube and submit the link on the Canvas. A sample video for the demonstration has been uploaded on the YouTube. **Finally**, upload the scanned or word lab report and zipped project on the Canvas.

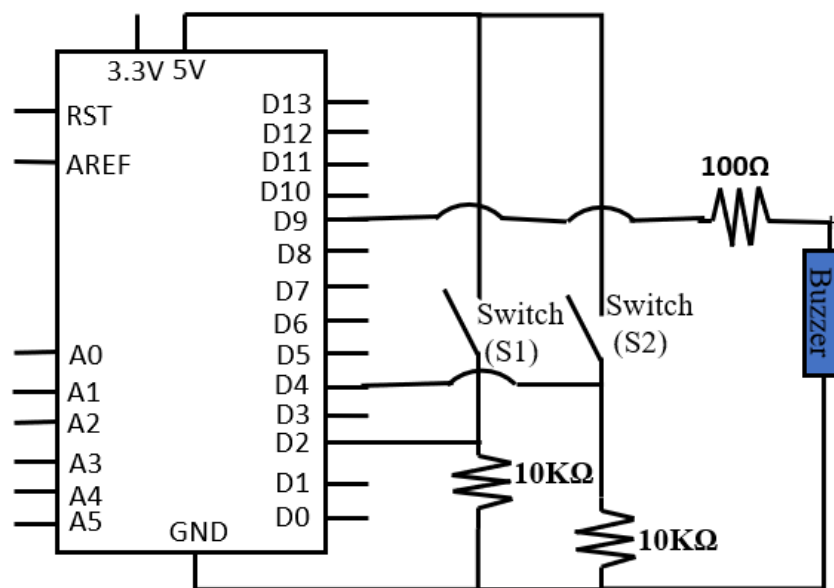
Objectives:

This lab introduces Arduino UNO and helps to understand simple programming using Arduino IDE.

Requirements:

1. When the push button S1 is pressed, blink (on and off) the LED based on factorial series. (1st press → 1 blink, 2nd press → 2 blink, 3rd press → 6 blinks, 4th press → 24 blinks, and so on).
2. Each time when S1 is pressed, buzzer generates a beep.
3. When the push button S2 is pressed, the factorial series and press count for push button S2 should be reset to zero.
4. Push button S1 is pushed again only after the blinking event is complete.
5. The blinking should be accomplished by delay function.

Circuit Connection:



- pushbutton (S1) attached to pin 2 from +5V
- 10K Ω resistor attached to pin 2 from ground
- pushbutton (S2) attached to pin 4 from +5V
- 10K Ω resistor attached to pin 4 from ground
- Connect positive side of the buzzer with pin 9 through a register of 100 Ω .
- The negative terminal of the buzzer should be connected to ground.

Procedure:

1. Run the example codes after reading and installing Arduino setup document posted on the Canvas.
2. Use the example codes to blink the LED based on push button
3. You need to generate a factorial series using c++ code. You can do user defined function for the factorial.
4. You need to count the number of presses for push button S1.
5. You need to blink on-board LED which is attached to PIN 13, according to number of presses.
NB: Most Arduinos have an on-board LED you can control. On the UNO, MEGA and ZERO it is attached to digital pin 13.
6. You can generate beep sound on the buzzer using `tone()` function. See the following link: <https://www.arduino.cc/reference/en/language/functions/advanced-io/tone/>
7. When S2 is pressed, the press count for S2 will be reset to zero.
8. Record your observation in the report.

Submission Process:

Complete the lab report using “lab report template” available on Canvas. Upload the lab report and Arduino zipped project on the Canvas. Online students should submit the video link as well.

You can watch my demonstration here;

<https://www.youtube.com/watch?v=VxBh2XOq3OA&t=27s>