

ECE-231 Lab Assignment #3

Assigned Wednesday 2/28/24

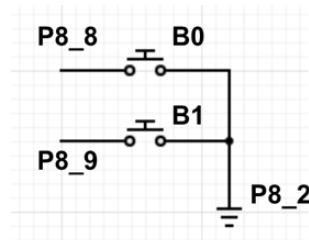
Due: 11:59 pm Saturday 3/9/24

Moodle References:

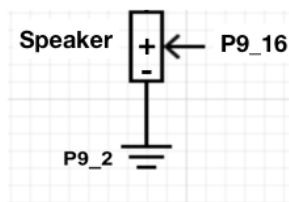
- Lecture 6 in Week 3 covers GPIO concepts
- Lecture 7 in Week 4 covers GPIO and PWM programming

A. Use the following instructions to interface hardware to beaglebone

1. Connect one push button to the GPIO pin P8_8 on the beaglebone header. Connect another push button to GPIO PIN P8_9 on beaglebone header



2. Connect the mini speaker (CEM-1203) to the PWM pin P9_16 on your beaglebone



B. Develop a C program that meets the following requirements:

3. Write code that configures the two pins P8_8 and P8_9 as GPIO input pins, and configure P9_16 in PWM mode
4. In an infinite while loop, check the state of the two buttons that are attached to GPIO input pins
5. If the button corresponding to pin P8_8 is pressed, then produce a PWM of frequency 10 Hz with 50% duty cycle on pin P9_16
6. If the button corresponding to pin P8_9 is pressed, then produce a PWM of frequency 1000 Hz with 50% duty cycle on pin P9_16
7. The speaker attached to the PWM pin P9_16 will produce different sounds corresponding to different frequencies

C. Write a makefile and use it to compile your C program

D. Run the program binary, push alternately both buttons twice, and observe the speaker sound. You can exit the program using CTRL-C

Notes:

- You have to use your beaglebone for this assignment. Follow the instructions covered in lecture 6 on how to program and compile for beaglebone
- This is an individual assignment: you must write your own code and do not share it
- Read the instructions carefully multiple times to understand the program requirements and to produce the desired outcome
- The lecture material supporting this assignment has already been covered in the class
- The TAs will support you during lab hours

What to turn in:

- By the deadline, upload to Moodle the following list of files:
 - C source code file
 - makefile
 - Video recording that shows both buttons pressed two times alternately, and produces a different frequency sound on the speaker. Make sure that the speaker sound is audible