Lab 1
CPE 416
Fall 2023
Due: end of lab (10/2/23)

For this assignment you will write a few practice programs to become familiar with your Bumblebee board.

Download the Bumblebee library and install the AVR compiler.

Tips on using the Bumblebee:

- LED0 will always flash 1 time after reset
- `_delay_ms()` and `_delay_us()` functions cannot take a variable as an argument
    - The argument must be a constant

Compiling your program

At the command prompt, type `make` to compile your code. To program the board, use one of the following (depending on your OS):

- `make program_windows`
- `make program_mac`
- `make program_linux`

Part 1 (lab1_part1.c)

For part 1, write a program that gradually fades LED0 on and then off. Then, it should do the same with LED1 and then the program should

Part 2 (lab1_part2.c)

Write a program that repeatedly scrolls your full name across the LCD display. Pressing the user button should switch to the name of your lab partner. Your program should run continuously.

Part 3 (lab1_part3.c)

Implement a simple Pong game using 5 LEDs and the breadboard switch. The LEDs should be placed in a row and turn on in a back-and-forth pattern. When the LED at the end of each row is on, the player should press the button to keep the game going. Once the player misses a button press, the screen should display the final LED delay time. The LED delay time should decrease as the game progresses.

To use the breadboard switch, you will need to solder a wire into the hole near the S1 switch. Run the other end of this wire into a digital input. You will also need a resistor to pull up the signal to 5V.

Part 4 (lab1_part4.c)

Create a program which scrolls the number ’416’ on the display that is controlled by the tilt of the board. The program should work along the 2 axes. The number should never completely disappear from the screen, but should show at least 1 digit.

Handin

Use handin to turn in your source code. Be sure to put the following header at the top of your source files:

```
program does
...
...
...source code...
...
...
```

handin command: `handin jseng CPE416_lab1 filename.c`