Lab 1
Name:
CEE-345 Microprocessor System Design

Part 1: Toggling LEDs on and off on the STK-600 board with a blinking pattern.

- Loading registers, setting up ports, outputting value to ports, creating LED pattern, creating a delay, and creating iterations.

```
.include "m8515def.inc" // Header file for ATmega8515 micro
.def temp = r16         // rename register r16 to temp
;initialize the stack pointers

start:

    ldi temp, low(RAMEND)   ;load SPL (low byte of the stack)
    out SPL, temp           ;load low byte address to SPL pointer register
    ldi temp, high(RAMEND)  ;load SPH (the high byte of the stack)
    out SPH, temp           ;load high byte address to SPH pointer register

    ldi temp, $ff           ;set up PORTB as outputs
    out DDRb, temp          ;DDRB means "Data register B"
    out PORTB, temp         ;outputs the temp to portb

loadbyte:

    rol temp                ;creates the LED pattern
    out PORTB, temp         ;update LEDs
    rcall one_sec_delay     ;call the one_sec_delay
    rjmp loadbyte           ;repeat

one_sec_delay:

    ldi r20, 20             ;20d = 14h
    ldi r21, 25             ;25d = 19h
    ldi r22, 25

delay:
                            ;delays with a nested loop
    dec r22                 ;255*255 total iterations
    brne delay
    dec r21                 ;255 iterations
    brne delay
    dec r20                 ;20 iterations
    brne delay

    ret                     ;return
```

Part 2: Modify codes from Part 1 so that it generates a new LED blinking pattern. LED flashing at an alternate pattern with two LEDs on at a time.

- Loading registers, creating two different LED patterns, creating a delay for both, setting up the ports, and setting up iterations.

Add code image here

Part 3: Writing C code for program 1.

- Clock speed for controller, creating LED pattern, creating a time delay, and goes through the sequence 8 times.

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