Bonus Assignment - 10% of the Final Grade

1. Calculate the absolute value of two numbers' difference. The number is stored at r16 and r17 (aka. |r16-r17|). Store the result to register r20. In the program, you are not allowed to use compare instruction (cp).

2. Write an assembly program that will reverse a 10-element array stored in memory, using the stack. The elements should start at location 0x0100. Your program should start by loading 10 elements into memory.

3. Use the time delay chart provided in the slides. Given the follow program, how long will this code take to run on a machine operating at 1 GHz? Since comparisons are just arithmetic, you may assume "cp" takes 1 cycle.

```
    ldi r16, 0
    ldi r17, 10
    ldi r19, 0
l1: cp r16, r17
    breq e1
    add r19, r16
    inc r16
    jmp l1
e1: nop
```

4. Explain the following code:

```
in r16, DDRC
in r17, PORTC
cbr r16, 0b00111111
sbr r17, 0b00111111
out DDRC, r16
out PORTC, r17
```