;1DT301, Computer Technology I :Date: 2019-09-18 :Author: Student name 1: Einar van de Velde Student name 2: Abdulla Mehdi ;Lab number: 2. Task 4. :Title: STK600, CPU ATmega2560. ;Hardware: :Function: Modify the program in task 5 in Lab 1to a general delay routine that can be called from other programs. It should be named wait milliseconds. The number of milliseconds should be transferred to register pair R24, R25 ;Input ports: None. ;Output ports: On-board LEDs connected to PORTB. :Subroutines: WAIT_MILLISECONDS. ;Included files: m2560def.inc :Other information: We had to remake Lab 1, Task 5 in order to complete this task. Therefore it took longer than was normally needed. ;Changes in program: File Created (2019-09-18) Had to recreate lab 1, task 5 because of difficulties. (2019-09-18) lab 1, task 5 code complete & lab 2 task 4 started (2019-09-21) Program is runnable (2019-09-23) .include"m2560def.inc" Idi r16,HIGH(RAMEND) out SPH, r16 Idi r16, LOW(RAMEND) out SPL, r16

ser r16 out DDRB, r16

out PORTB, r16

INIT:

```
ldi r16, 0b11111110
        out PORTB, r16
ON:
        rcall WAIT_MILLISECONDS
        rol r16
        inc r16
        out PORTB, r16
        cpi r16, 0b11111111
        breq INIT
rjmp ON
;----- DELAY -----
WAIT_MILLISECONDS:
        ldi r23, 255
        ldi r24, 0
        DEL_1:
                rcall DELAY_2
        rjmp HIGH_
        FINISH:
                 inc r24
                 cp r23, r24
                 brne DEL_1
        ret
        DELAY_2:
                 ldi r25, 255
                ldi r26, 0
                 DEL 2:
                         inc r26
                         cp r25, r26
                         brne DEL_2
                 ret
HIGH_:
        Idi r17, high(1000)
        Idi r18, 0
        DEL_HIGH:
                 rcall CARRY_BIT
                 inc r18
                 cp r17, r18
                 brne DEL_HIGH
        rjmp LOW_
```

```
CARRY_BIT:
        ldi r19, 128
        ldi r20, 0
        DEL:
                 inc r20
                 cp r19, r20
                 brne DEL
        ret
LOW_:
        ldi r21, low(1000)
        ldi r22, 0
        DEL_LOW:
                 inc r22
                 cp r21, r22
                 brne DEL_LOW
        rjmp FINISH
```