```
;1DT301, Computer Technology I
:Date: 2019-10-01
:Author:
                     Einar van de Velde
 Student name 1:
 Student name 2:
                     Abdulla Mehdi
;Lab number:
                     3.
                     Task 3.
:Title:
                     STK600, CPU ATmega2560.
;Hardware:
:Function:
                     Program that simulates the rear lights on a car
                     The 8 LEDs should behave like the rear lights.
;Input ports:
                     PORTD.
;Output ports:
                     On-board LEDs connected to PORTB.
:Subroutines:
                     TURN LEFT.
                     TURN RIGHT.
                     INTERRUPT 0.
                     INTERRUPT 1.
Included files:
                     m2560def.inc
Other information:
;Changes in program:
     File Created (2019-10-01)
          Program is runnable (2019-10-02)
.include"m2560def.inc"
.org 0x00
rjmp START
.org INT0addr
rjmp INTERRUPT 0
.org INT1addr
rimp INTERRUPT 1
.org 0x72
START:
  Idi r20, HIGH(RAMEND)
  out SPH,r20
 Idi r20, LOW(RAMEND)
  out SPL, r20
```

```
ldi r16, 0x00
  out DDRD, r16
  out DDRA, r16
  ldi r16, 0xff
  out DDRE, r16
  out DDRB, r16
  ldi r16, 0b00000011
  out EIMSK, r16
  ldi r16, 0b00001010
  sts EICRA, r16
  sei
MAIN:
  ldi r16, 0xff
  out DDRB, r16
  com r16
  out DDRD, r16
  ldi r24, 1
LOOP:
  cpi r24, 1
  breq NORMAL
  cpi r24, 2
  breq LEFT
  cpi r24, 3
  breq RIGHT
rjmp LOOP
:NORMAL -----
NORMAL:
  ldi r17, 0b00111100
  out PORTB, r17
rjmp LOOP
;LEFT -----
LEFT:
  ldi r17, 0b11101100
  rcall DELAY_1
  out PORTB, r17
  ldi r17, 0b11011100
  rcall DELAY_1
```

```
out PORTB, r17
  ldi r17, 0b10111100
  rcall DELAY_1
  out PORTB, r17
  ldi r17, 0b01111100
  rcall DELAY_1
  out PORTB, r17
rjmp LOOP
;RIGHT -----
RIGHT:
  ldi r17, 0b00110111
  rcall DELAY_1
  out PORTB, r17
  ldi r17, 0b00111011
  rcall DELAY_1
  out PORTB, r17
  ldi r17, 0b00111101
  rcall DELAY_1
  out PORTB, r17
  ldi r17, 0b00111110
  rcall DELAY 1
  out PORTB, r17
rjmp LOOP
;DELAY_1 -----
DELAY_1:
  ldi r20, 255
  ldi r21, 0
  DEL_1:
    rcall DELAY 2
    inc r21
    cp r20, r21
    brne DEL_1
  ret
DELAY 2:
  ldi r22, 255
  ldi r23, 0
  DEL 2:
    inc r23
```

```
cp r22, r23
    brne DEL 2
  ret
;-----
;INTERRUPT_0 -----
INTERRUPT_0:
  push r16
  in r16, sreg
  push r16
  cpi r16, 0x00
  breq PRESS_0
PRESS_0:
  cpi r24, 2
  brne TURN_RIGHT
  ldi r24, 1
rjmp DONE_1
TURN_RIGHT:
  ldi r24, 2
DONE 1:
  pop r16
  out sreg, r16
  pop r16
reti
;INTERRUPT_1 ------
INTERRUPT_1:
  push r16
  in r16, sreg
  push r16
  cpi r16, 0x00
  breq PRESS_1
PRESS_1:
  cpi r24, 3
  brne TURN LEFT
  ldi r24, 1
rjmp DONE_2
TURN_LEFT:
  ldi r24, 3
DONE_2:
  pop r16
```

out sreg, r16 pop r16 reti