```
;>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
;1DT301, Computer Technology I
;Date: 2019-09-17
;
;Author:
;   Student name 1:          Einar van de Velde
;   Student name 2:          Abdulla Mehdi
;
;Lab number:                 1.
;Title:                      Task 5.
;
;Hardware:                   STK600, CPU ATmega2560.
;
;Function:                   Create a Ring Counter. The values should be displayed
;                            with the LEDs. Use shift instructions, LSL or LSR.
;                            Make a delay of approximately 0.5 sec in between each
;                            count.
;
;Input ports:                None.
;
;Output ports:               On-board LEDs connected to PORTB.
;
;Subroutines:                None.
;
;Included files:             m2560def.inc
;
;Other information:
;Changes in program:
;       File Created (2019-09-16)
;               Program is runnable (2019-09-17)
;
;<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
.include "m2560def.inc"

;Initialize SP, Stack Pointer (Stack pointer is NOT used)
ldi r20, HIGH(RAMEND)           ; R20 = high part of RAMEND address
out SPH,R20                     ; SPH = high part of RAMEND address
ldi R20, low(RAMEND)            ; R20 = low part of RAMEND address
out SPL,R20                     ; SPL = low part of RAMEND address

ldi r16, 0xFF                   ;Loads 255 at register 16
out DDRB, r16                   ;Initialize port B

;-----------------------------
;Main Loop
;-----------------------------
MAIN:
   ldi r21, 0b11111110          ;Turn the first LED0 on.
   ldi r22, 0b00000001          ;Turn the first LED0 off.
```

```
;----------------------------
;START Func
;----------------------------
   START:
      out PORTB, r21

      rcall SHIFT                ;Call SHIFT func
      rcall DELAY                ;Call DELAY func

      cpi r21, 0xFF              ;loops the program

      breq MAIN
   rjmp START

;----------------------------
;SHIFT Func
;----------------------------
   SHIFT:
      lsl r21
      add r21, r22
   ret

;----------------------------
;DELAY Func
;----------------------------
   DELAY:
   ; Generated by delay loop calculator
   ; at http://www.bretmulvey.com/avrdelay.html
   ;
   ; Delay 500 000 cycles
   ; 500ms at 1 MHz

      ldi  r18, 4
      ldi  r19, 138
      ldi  r20, 86
   L1: dec  r20
      brne L1
      dec  r19
      brne L1
      dec  r18
      brne L1
       rjmp PC+1
   ret
;----------------------------
```