

```
; -----↵
; This program measures the signal period using ICP1 pin and represents the period
; in the unit of clock cycle.
; -----↵

    .include    <m2560def.inc>
    .def      t1OVCnt = r25
    .def      perHi   = r2
    .def      perLo   = r3
    .def      tmp     = r16
    .cseg
    .org      0x00
    jmp start
    .org      OVf1Addr
    jmp T1OVISR
    .org      0xF6
start:  ldi tmp,low(RAMEND) ; initialize the SP
        out SPL,tmp      ; "
        ldi tmp,high(RAMEND); "
        out SPH,tmp      ; "
        ldi tmp,0xEF
        out DDRD,tmp     ; configure PD4 for input (ICP1 pin)
        ldi tmp,0
        sts TCCR1A,tmp   ; configure Timer 1 to normal mode
        mov t1Ovcnt,tmp ; initialize Timer 1 overflow count to 0
        ldi tmp,1<<ICF1 ; clear ICF1 flag
        out TIFR1,tmp    ; "
        ldi tmp,0x42    ; capture rising edge, use clk_I/0 / 8 as clock source to Timer 1
        sts TCCR1B,tmp   ; "
edge1:  in tmp,TIFR1     ; wait until the first rising edge arrives
        sbrc tmp,ICF1   ; "
        rjmp edge1     ; "
        ldi tmp,0
        sts TCNT1H,tmp  ; force Timer 1 to count up from 0
        sts TCNT1L,tmp  ; "
        ldi tmp,0x01    ; enable Timer 1 overflow interrupt
        sts TIMSK1,tmp  ; "
        ldi tmp,(1<<ICF1)|(1<<TOV1) ; clear ICF1 and TOV1 flags
        out TIFR1,tmp   ; "
        sei             ; enable interrupt globally
edge2:  in tmp,TIFR1     ; wait until the second rising edge arrives
        sbrc tmp,ICF1   ; (when ICF1 flag is set to 1)
        rjmp edge2     ; "
        lds perLo,ICR1L ; copy the latched timer 1 value
        lds perHi,ICR1H ; "
        ldi tmp,0       ; stop Timer 1
        sts TCCR1B,tmp  ; "
here:   jmp here       ;
; -----↵
; The Timer 1 overflow interrupt service routine increment the overflow count by 1.
; -----↵

T1OVISR:  inc t1OVCnt
          reti
```