

پاسخ کوییز چهارم ریزپردازنده

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Include 'M64DEF.INC'
.ORG 0x0000
JMP main
.ORG 0x0020
JMP Timer0_ISR
.ORG 0x0014
JMP Timer2_ISR
.ORG 0x0050
main : LDI R16, low(RAMEND)
      OUT SPL, R16
      LDI R16, high(RAMEND)
      OUT SPH, R16
      LDI R16, 0x00
      OUT TCCR2, R16
      LDI R16, 0x07
      OUT TCCR0, R16
      LDI R16, 56
      OUT TCNT0, R16
      LDI R16, 216
      OUT TCNT2, R16
      LDI R16, 0x41
      OUT TIMSK, R16
      LDI R16, 0x00
      OUT DDRA, R16
      SBI DDRB, 5
      CBI PORTB, 5
      CLR R16
      CLR R17
      CLR R18
      CLR R20
      SEI
Loop : JMP Loop

Timer0_ISR : LDI R16, 56
            OUT TCNT0, R16
            SEI
            CALL EV_50ms
            RETI
EV_50ms : INC R17
         CPI R17, 100
         BRNE EV_50end
         IN R20, PINA
         CLR R17
         SBI PORTB, 5
         LDI R16, 0x05
         OUT TCCR2, R16
         EV_50end : RET
Timer2_ISR : LDI R16, 216
            OUT TCNT2, R16
            CALL EV_10ms
            RETI
EV_10ms : INC R18
         ANDI R20, 0x01
         BRNE odd_A
         LDI R19, 03
         JMP next
         odd_A : LDI R19, 38
         next : CP R18, R19
              BRNE EV_10end
              LDI R16, 0x00
              OUT TCCR2, R16
              CBI PORTB, 5
              CLR R18
         EV_10end : RET

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$$f_t = \frac{4 / 0.96 \text{MHz}}{1024} = 4 \text{KHz} \rightarrow T_t = \frac{1}{4} \text{msec.} \rightarrow \begin{cases} \frac{50 \text{msec.}}{T_t} = 200 \rightarrow 256 - 200 = 56 \\ \frac{10 \text{msec.}}{T_t} = 40 \rightarrow 256 - 40 = 216 \end{cases}$$

می توان برنامه را با یک تایمر و با زمان پایه 10msec. نیز نوشت.