;ECE331 Quiz 8 Name: Solution CM#_____

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;The following program must flash the LED at a 1 second rate until a 9600 baud
;odd-parity 8-data bit character is received on the SCI port (from a PC running
;Hyperterminal). Once a character is received, the flash rate is altered. If
;a "3" is sent, the LED flashes at a 3 second rate, if a "5" is sent, the
;LED flashes at a 5 second rate, etc.

;The serial character that is sent is assumed to be one of the digits 1,2,3,....9.
;This application is interrupt driven... when the SCI receives a
;character, it must interrupt the microcontroller.  The purpose of the interrupt
;is to relax the interrupt flag (shut the baby up), read the received character,
;and then strip off its upper 4 bits, and write it into the "Flashrate" RAM location.

;Note each time a new digit is received, the flash rate will be changed.

; Fill in the missing blanks in the code below:

        XDEF Entry              ; export 'Entry' symbol
        ABSENTRY Entry          ; for absolute assembly: mark this as application entry point

        INCLUDE 'mc9s12c128.inc'
BD9600  EQU  2000000/(  16 * 9600  )
        ORG $400
FlashRate  DS.B 1               ;Number of seconds to be delayed by VARDELAYSUB goes here.
        ORG $4000

Entry:
        LDS  #$1000
        BSET DDRT,  %10000000   ;Make PT7 output (LED connected there)
        MOVB #1,FlashRate
        MOVW #BD9600,  SCIBDH   ;Set SCI serial port for 9600 Baud

        MOVB #%  00010011  ,SCICR1   ;Configure SCI port for 9 bits and Odd parity.
                                     ; Note: 9th bit is odd parity bit and so
                                     ; there are only 8 data bits per character.

        MOVB #%  00100100  ,SCICR2   ;Enable SCI receiver as well as receive interrupts

        CLI                          ;Globally enable interrupts

KEEPGOING:  BSET PTT,%10000000
        JSR VARDELAYSUB
        BCLR PTT,%10000000
        JSR VARDELAYSUB
        BRA KEEPGOING

VARDELAYSUB:  PSHX              ;This subroutine delays for the number of seconds stored
              PSHY              ;in RAM location "FlashRate"
        PSHA
        LDAA  FlashRate
VARDELAY:  LDX #16
OUTERLOOP:  LDY #$3FFF
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INNERLOOP: DEY
        BNE INNERLOOP
        DEX
        BNE OUTERLOOP
        DECA
        BNE VARDELAY
        PULA
        PULY
        PULX
        RTS

SCI_ISR:   BRCLR  SCISR1,%00100000,SCI_ISR    ;Hang here if RDRF flag is not set
        LDAA   SCIDRL                         ;This loads received value and also CLEARS RDRF flag!
        ANDA   #%00001111                     ;Mask out digit value assuming 1 - 9 key is pressed
        STAA   FlashRate
        RTI

        ORG   $FFFE
        DC.W  Entry
        ORG   $FFD6  ← SCI Interrupt Vector
        DC.W  SCI_ISR
```