

1. Write a program to add the following data and store the result in RAM location 30H

ORG 200H

Mtdata: DB 06,09,02,05,07

Code:

org 200h

Mydata;; Set origin to address 200H

DB 06, 09, 02, 05, 07 ; Data bytes

org 0000h ; Set origin to address 00H

mov dptr, #200H ; Load DPTR with the address 200H

mov R4, #05H ; Load R0 with 05H

mov R5,#00H

LOOP:mov A,#0H

movc A,@ A+dptr

INC DPTR

add A,R5

mov R5,A

DJNZ R4, LOOP

mov 30H,A

END ; End of program

2. Verify an assembly program to add array of bytes from RAM location and store answer into RAM locations. No of bytes is user defined

Code:

```
org 0000H
    MOV R0,50H
    MOV R1,#60H
    MOV R2,#00H
    MOV R3,#00H
loop2: ADD A, @R1
    JNC loop1
    INC R2
loop1: INC R1
    DJNZ R0,loop2
    MOV 70H,R2
    MOV 71H,A
    END
```

3. Verify an assembly program to find the largest number from the array of bytes. Here number of bytes are user defined

Code:

```
org 0000H
    MOV R0,50H
    MOV A,@ R0
    MOV R2,A
    DEC R2
    INC R0
    MOV B,@ R0
    INC R0
back: MOV A,@ R0
    CJNE A,B, loop1
```

```
loop1: JC loop2
MOV B,A
loop2: INC R0
DJNZ R2,back
MOV 60H,B
END
```

4. Verify an assembly program to find a square of a given number(0-9) given in RAM memory location. Use look up table to find square of a given number

Code:

```
ORG 0000H
MOV DPTR, #300H
MOV A, 50H
DEC A
MOVC A, @ A+DPTR
MOV 60H,A

ORG 0300H
Sqrtable :
db 0,1,4,9,16,25,36,49,64,81
END
```

5. Write an assembly program to blink LEDs connected to Port2. Assume crystal Frequency 12 MHZ and generate blinking delay for 0.5 sec using looping method

Code:

```
MOV A, #00H
MOV P2, A
MOV A, #00H
BACK: MOV P2, A
ACALL DELAY
CPL A
SJMP BACK
DELAY:
MOV R5,#4
H3:MOV R4, #250
H2:MOV R3, #250
H1:DJNZ R3, H1
DJNZ R4, H2
DJNZ R5, H3
RET
END
```

6. Making an LED connected to port0 to glow for 100ms using timer0,  
mode1

Code:

ORG 0000H

```
MOV A , #00H
MOV P0,A
MOV TMOD, #01H
```

```
MOV A , #00H
Back : MOV P0,A
ACALL DELAY
CPL A
SJMP Back
```

```
DELAY :
MOV TH0,#0FFH
MOV TL0, #9CH
SETB TR0
HERE : JNB TFO, HERE
CLR TR0
CLR TFO
RET
END
```

7. Making an led connected to port0 to glow for 500ms usin timer0, mode1 or to generate a square wave of 2khz using timer0, mode1  
Code:

```
MOV A , #00H
    MOV P0,A
    MOV TMOD, #01H

    MOV A , #00H
    Back : MOV P0,A
    ACALL DELAY
    CPL A
    SJMP Back

    DELAY :
    MOV TH0,#0FEH
    MOV TLO,#0CH
    SETB TR0
    HERE : JNB TFO, HERE
    CLR TR0
    CLR TFO
    RET
    END
```

8. Making an led connected to port0 to glow for 150ms and then off for 400ms using timer1, mode1

Code:

```
ORG 0000H
```

```
    MOV A, #00H
```

```
    MOV P0, A
```

```
    MOV TMOD, #10H
```

MainLoop:

```
    ; Turn on LED
```

```
    MOV P0, #0FFH
```

```
    ; Delay for 150ms
```

```
    MOV TH1, #0FFH
```

```
    MOV TL1, #079H
```

```
    CALL Delay
```

```
    ; Turn off LED
```

```
    MOV P0, #00H
```

```
    ; Delay for 400ms
```

```
    MOV TH1, #0FEH
```

```
    MOV TL1, #084H
```

```
    CALL Delay
```

```
    SJMP MainLoop
```

Delay:

```
SETB TR1
HERE:
    JNB TF1, HERE
    CLR TR1
    CLR TF1
    RET
```

END

9. Making an LED connected to port0 to glow for 100ms in mode2 of timer1.

Code:

```
ORG 0000H
```

```
    MOV A, #00H
    MOV P0, A
    MOV TMOD, #20H
    MOV TH1, #9EH
```

```
MOV A, #0FFH
Back : MOV P0, A
    ACALL DELAY
    CPL A
    SJMP Back
```

```
DELAY :
    SETB TR1
    HERE : JNB TF1, HERE
    CLR TR1
```



```
CLR TF1
RET
END
```

10. Make p2.7 glow and off for 1000ms in mode1 of timer0  
Code: (DISPLAY MODE= ANALOG)

```
ORG 0000H
```

```
MOV TMOD,#01H
```

```
SETB P2.7
```

```
Back : ACALL DELAY
```

```
CPL P2.7
```

```
SJMP Back
```

```
DELAY :
```

```
MOV TH0, #0FCH
```

```
MOV TH1, #018H
```

```
SETB TR0
```

```
HERE : JNB TF0, HERE
```

```
CLR TR0
```

```
CLR TF0
```

```
RET
```

```
END
```

11. Make P0.0 and P1.0 glow and off for 200ms in mode 1 of timer0,  
mode1

Code:

ORG 0000H

MOV TMOD,#01H

SETB P0.0

SETB P1.0

Back : ACALL DELAY

CPL P0.0

CPL P1.0

SJMP Back

DELAY :

MOV TLO, #38H

MOV TH0, #0FFH

SETB TR0

HERE : JNB TFO, HERE

CLR TR0

CLR TFO

RET

END

12. Take inputs from p0.2,p0.1,p0.0 as switch and led connected to p1.0 is to be glow as (001-1khz),(010-2khz),(100-4khz) delay is given using timer0 , mode1

Code:

```
ORG 0000H
```

```
MOV TMOD, 01H
```

```
MOV P0, #0FFH
```

```
L3:MOV A, P0
```

```
MOV P1, #00H
```

```
CJNE A, #001B ,L1
```

```
CLR P1.0
```

```
HERE1: MOV TH0, #0FCH
```

```
MOV TLO, #01BH
```

```
ACALL DELAY
```

```
CPL P1.0
```

```
SJMP HERE1
```

```
L1 :CJNE A,#010B ,L2
```

```
CLR P1.0
```

```
HERE2 : CPL P1.0
```

```
MOV TH0, #0FEH
```

```
MOV TLO, #0CH
```

```
ACALL DELAY
```

```
SJMP HERE2
```

```
L2:CJNE A,#100B ,L3
```

```
CLR P1.0
HERE3 : CPL P1.0
MOV TH0, #0FFH
MOV TL0, #06H
ACALL DELAY
SJMP HERE3
```

```
DELAY :
SETB TRO
HERE:JNB TFO, HERE
CLR TRO
CLR TFO
RET
END
```

13 . Assume that the int 1 pin is connected to a switch that is normally high. Whenever it goes low it should turn on an LED. The LED is connected to P1.3 and is normally off. When it is turned on it should stay on for a fraction of a second. As long as switch is pressed low, the LED should stay on.

Code:

```
ORG 0000H
```

```
LJMP MAIN
```

```
ORG 0013H
```

```
SETB P1.3
```

```
MOV R3,#255
```

```
BACK: DJNZ R3,BACK
```

```
CLR P1.3
```

```
RETI
```

```
ORG 30H
```

```
MAIN: MOV IE,#10000100B
```

```
HERE: SJMP HERE
```

```
END
```

14. Program to interface seven segment display (0-9) when connected to port 1.

Code:

```
ORG 0000H
```

```
MAIN: MOV DPTR, #400H
```

```
REPEAT: CLR A
```

```
MOVC A, @A+DPTR
```

```
MOV P1, A
```

```
ACALL DELAY
```

```
INC DPTR
```

```
CJNE A, 0, REPEAT
```

```
SJMP MAIN
```

```
DELAY:
```

```
MOV R0, #08H
```

```
LP2: MOV R1, #0FFH
```

```
LP1: MOV R2, #0FFH
```

```
LP3: DJNZ R2, LP3
```

```
DJNZ R1, LP1
```

```
DJNZ R0, LP2
```

```
RET
```

```
ORG 400H
```

```
DB 3FH, 06H, 5BH, 4FH, 66H, 6DH, 7DH, 07H, 7FH, 6FH
```

```
END
```

15. Write an 8051-assembly program to transfer data "LAB ASSESSMENT" serially at baud rate 9600 with 8-bit data, one stop bit and observe the transmitted data in the serial window of the simulator. Provide solution by both polling and interrupt  
Code:(BY POLLING METHOD)

```
MOV TMOD, #20H
MOV TH1, #-3
MOV SCON, #50H
CLR TI
SETB TR1

L1: MOV DPTR, #MYDATA
BACK: CLR A
MOVC A, @ A+DPTR
JZ L1
ACALL TRANS
INC DPTR
SJMP BACK

TRANS: MOV SBUF, A
HERE: JNB TI, HERE
CLR TI
RET

ORG 300H
MYDATA:
DB "LAB ASSESSMENT", 0

END
```

(BY INTERRUPT METHOD)

ORG 0000H

MAIN:MOV DPTR,#MYDATA

MOV TMOD,#20H

MOV TH1,#-3

MOV SCON,#50H

SETB TR1

MOV R1,#14

AGAIN: CLR A

MOVC A,@A+DPTR

MOV SBUF,A

HERE: JNB TI,HERE

CLR TI

INC DPTR

DJNZ R1,AGAIN

SJMP MAIN

MYDATA: DB "LAB ASSESSMENT"

END



16. Write a program that continuously get 8 bit data from P0 sends to P1 while simultaneously creating a square wave of 200 ms period on pin P2.1. use timer 0 to create the square wave.

Code:

```
ORG 0000H
```

```
MAIN: MOV DPTR, #400H
```

```
REPEAT: CLR A
```

```
MOVC A, @A+DPTR
```

```
MOV P1, A
```

```
ACALL DELAY
```

```
INC DPTR
```

```
CJNE A, 0, REPEAT
```

```
SJMP MAIN
```

```
DELAY:
```

```
MOV R0, #08H
```

```
LP2: MOV R1, #0FFH
```

```
LP1: MOV R2, #0FFH
```

```
LP3: DJNZ R2, LP3
```

```
DJNZ R1, LP1
```

```
DJNZ R0, LP2
```

```
RET
```

```
ORG 400H
```

```
DB 3FH, 06H, 5BH, 4FH, 66H, 6DH, 7DH, 07H, 7FH, 6FH
```

```
END
```

17. WRITE A PROGRAM WITH SERIAL COMMUNICATION INTERRUPT IN WHICH THE 8051 READS DATA FROM P1 AND WRITES IT TO P2 CONTINUOUSLY WHILE GIVING A COPY OF IT TO SERIAL COM PORT TO BE TRANSFERRED SERIALLY. XTAL=11.0592. BAUD RATE = 9600

CODE:

```
ORG 0000H
```

```
MOV P1, #00H
```

```
MOV P2, #00H
```

```
MOV TMOD, #20H
```

```
MOV TH1, #0FDH
```

```
MOV SCON, #50H
```

```
SETB TR1
```

```
SETB EA
```

```
SETB ES
```

```
MAIN_LOOP:
```

```
  NOP
```

```
  SJMP MAIN_LOOP
```

```
SERIAL_ISR:
```

```
  MOV A, SBUF
```

```
  MOV P2, A
```

```
  CLR RI
```

```
  RETI
```

```
END
```

