ECE3003 – Microcontroller And Its Applications

TASK - IV

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Registration Number: 16BEC0450

Slot : L37 + L38

Submitted to : Prof. Chitra P

Program 1

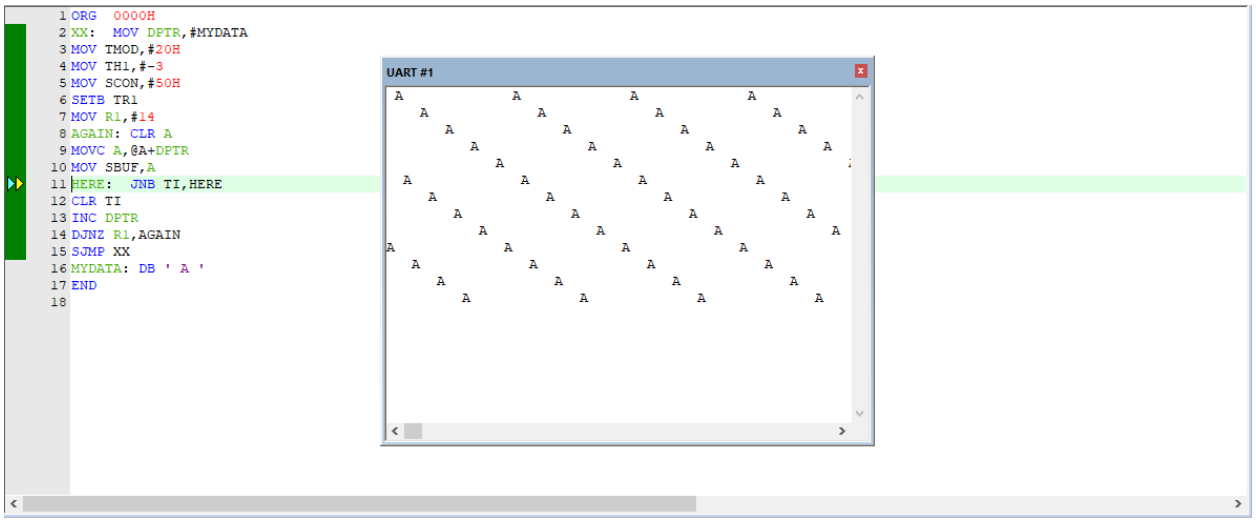
Write an 8051 assembly program to transfer data "**A**" serially at baud rate 9600 with 8 bit data, one stop bit and observe the transmitted data in the serial window of the simulator.

Code

```
ORG 0000H
XX: 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 XX
MYDATA: DB 'VIT UNIVERSITY'
```

```
END
```

Output



Program 2

Write a 8051 Assembly Language program to get data from the PC and display it on P1. Assume 8051 is connected to PC and observe the incoming characters. As you press a key on the PC's keyboard, the character is sent to the 8051 serially at 4800 baud rate and is displayed on LEDs. The characters displayed on LEDs are in ASCII (binary).

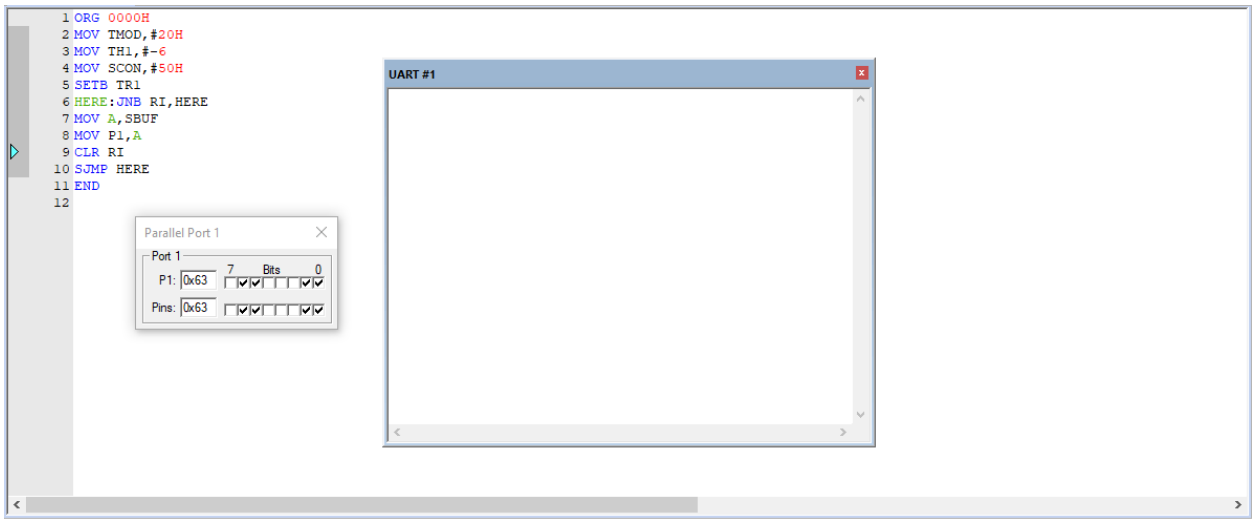
Code

```
ORG 0000H
MOV TMOD,#20H
MOV TH1,#-6
MOV SCON,#50H
SETB TR1
HERE:JNB RI,HERE
MOV A,SBUF
MOV P1,A
CLR RI
```

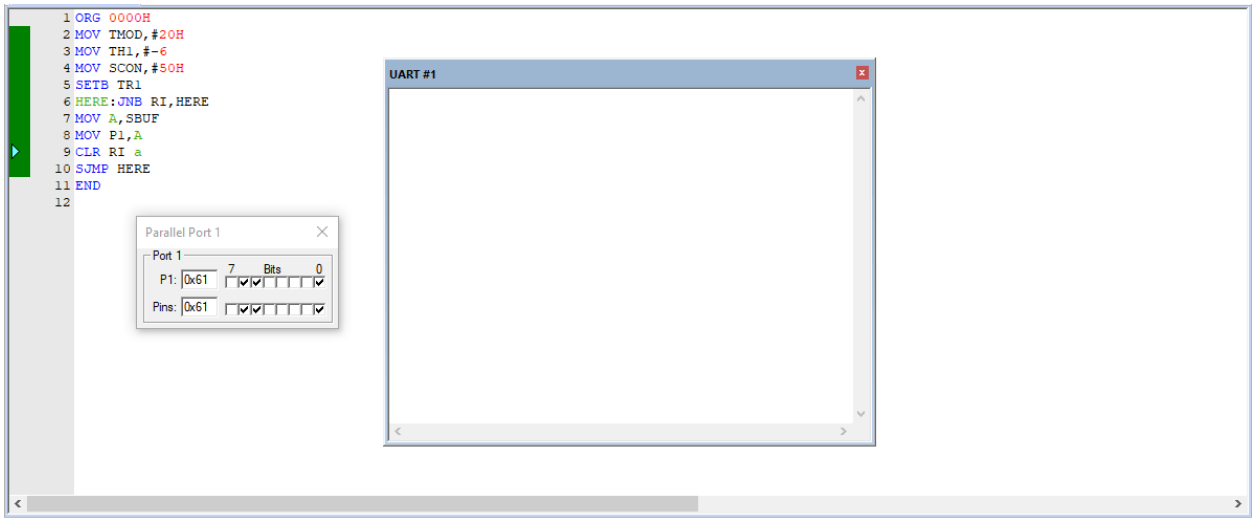
```
SJMP HERE
END
```

Output

‘C’ from UART to P1.



‘A’ from UART to P1.



Task 4A

Write a program to send the message "India is our Country" to serial port. Assume a SW is connected to pin P1.2.Monitor its status and set the baud rate as

Follows:

SW = 0, 4800 baud rate

SW = 1, 9600 baud rate

Assume XTAL = 11.0592 MHz, 8-bit data, and 1 stop bit.

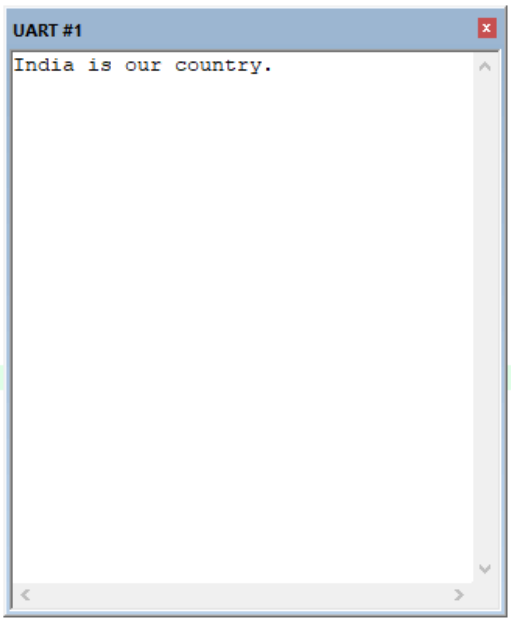
Use Hyper terminal for your Results

```
ORG 300H
DB "India is our country."
ORG 000H
MOV R0, #20H
SETB P1.2
MOV TMOD, #20H
MOV SCON, #50H
MOV C, P1.2
JC L1
MOV TH1, #-6
SJMP L2
L1 : MOV TH1, #-3
L2: MOV DPTR, #300H
SETB TR1
BACK : CLR A
MOVC A, @A+DPTR
MOV SBUF, A
HERE:  JNB TI,HERE
CLR TI
INC DPTR
```

```
DJNZ R0, BACK
END
```

Output

```
1  ;16BEC0094
2  ORG 300H
3      DB "India is our country."
4  ORG 000H
5  MOV R0, #20H
6  SETB P1.2
7  MOV TMOD, #20H
8  MOV SCON, #50H
9  MOV C, P1.2
10 JC L1
11 MOV TH1, #-6
12 SJMP L2
13 L1 : MOV TH1, #-3
14 L2: MOV DPTR, #300H
15 SETB TR1
16 BACK : CLR A
17 MOVC A, @A+DPTR
18 MOV SBUF, A
19 HERE:  JNB TI,HERE
20 CLR TI
21 INC DPTR
22 DJNZ R0, BACK
23 END
24
```



Task 4B

Write a program to send the message "YOUR NAME" and "REGISTER NO" to serial port. Assume a SW is connected to pin P1.2. Monitor its status and set the baud rate as Follows:

SW = 1, Send "YOUR NAME" at 9600 baud rate

SW = 0, Send "REGISTER NO" at 19200 baud rate

Assume XTAL = 11.0592 MHz, 8-bit data, and 1 stop bit.

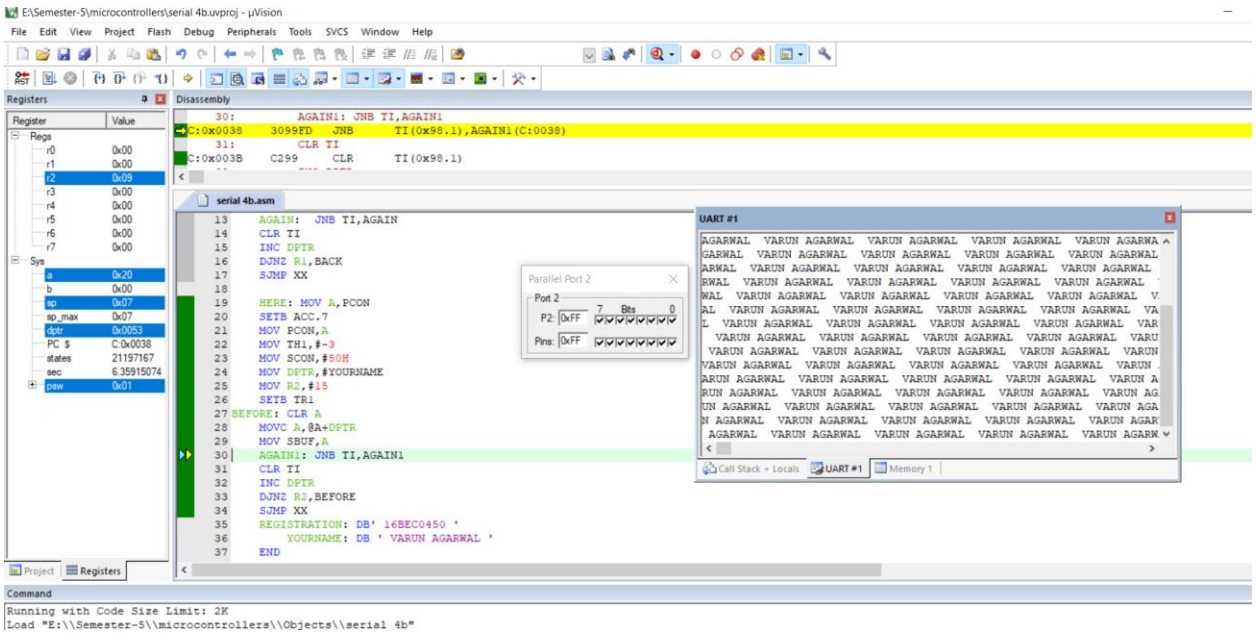
Use Hyper terminal for your Results

Code

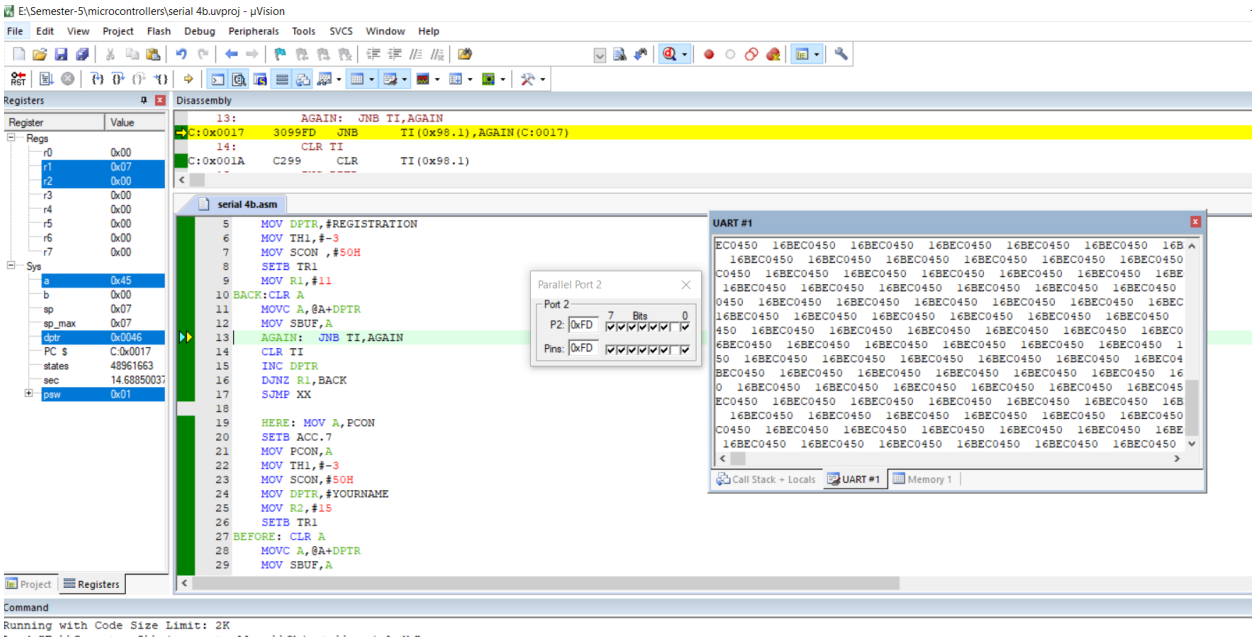
```
ORG 300H
DB "VARUN AGARWAL"
ORG 200H
DB "16BEC0450"
ORG 000H
MOV C, P1.2
JC L1
MOV A, PCON
SETB ACC.7
MOV PCON, A
MOV TH1, #-6
MOV DPTR, #200H
SETB TR1
BACK: CLR A
MOVC A, @A+DPTR
MOV SBUF, A
HERE: JNB TI, HERE
CLR TI
INC DPTR
DJNZ R1, BACK
L1: MOV TH1, #-3
MOV DPTR, #300H
SETB TR1
BACK2: CLR A
MOVC A, @A+DPTR
MOV SBUF, A
HERE2: JNB TI, HERE2
CLR TI
INC DPTR
DJNZ RO, BACK2
SJMP START
END
```

Output

Name : Varun Agarwal



Registration Number : 16BEC0450



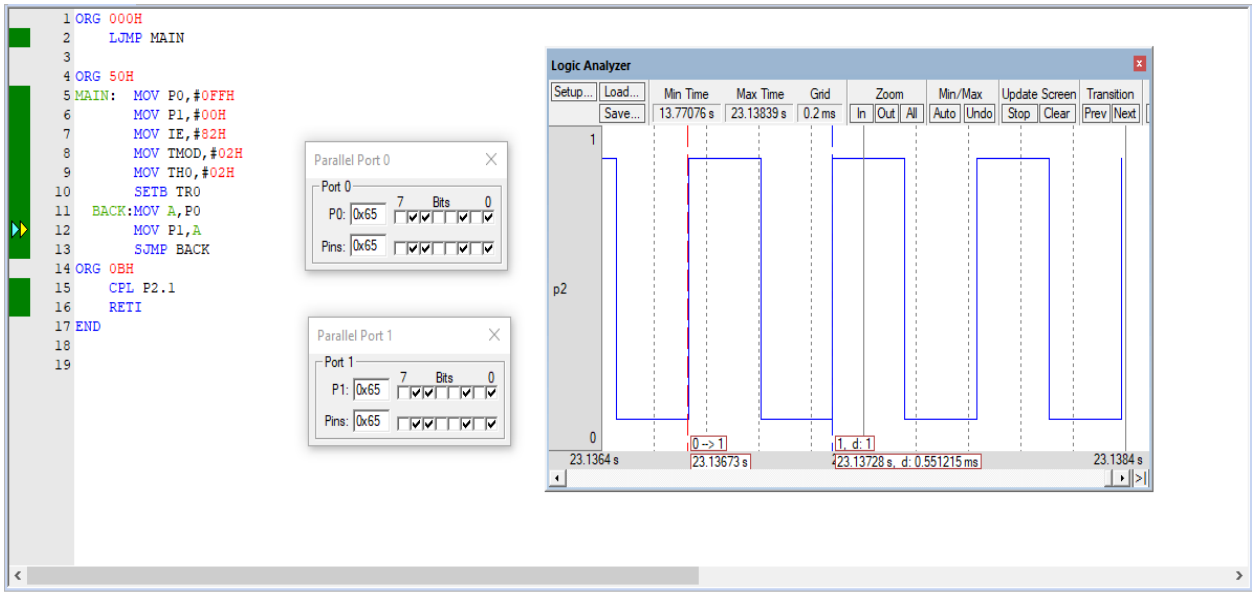
Program 1

Write an 8051 program to get data from port P0 and send it to port P1 continuously while an interrupt will do the following: Timer 0 will toggle the P2.1 bit every 100 microseconds.

Code

```
ORG 000H
      LJMP MAIN

ORG 50H
MAIN:  MOV P0,#0FFH
         MOV P1,#00H
         MOV IE,#82H
         MOV TMOD,#02H
         MOV TH0,#02H
         SETB TR0
  BACK:MOV A,P0
         MOV P1,A
         SJMP BACK
ORG 0BH
      CPL P2.1
      RETI
END
```

Output



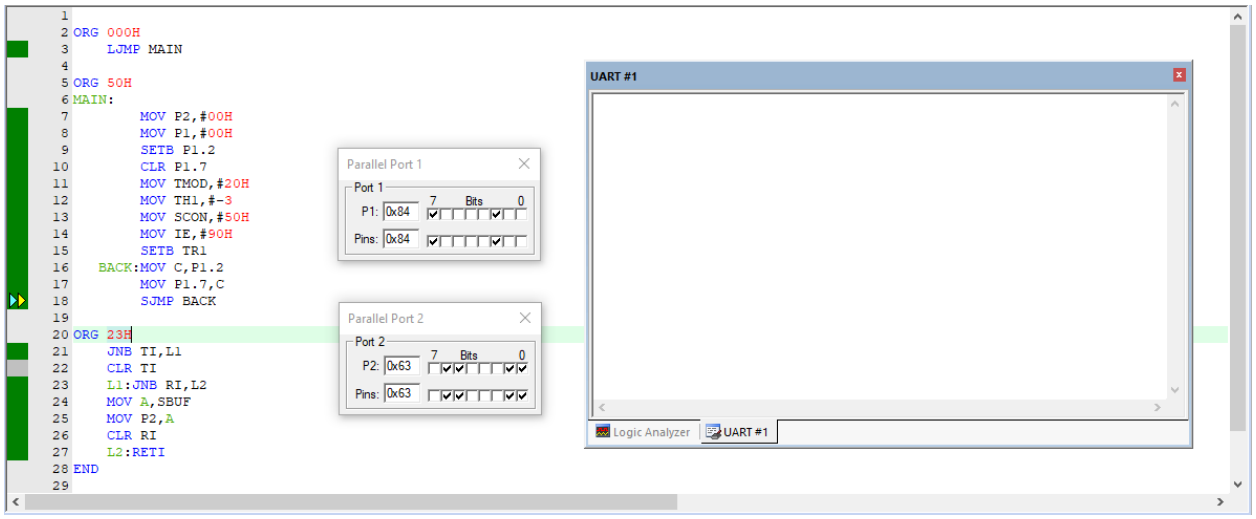
Program 2

Write an 8051 program to get data from a single bit of P1.2 and send it to P1.7 continuously while an interrupt will do the following: A serial interrupt service routine will receive data from a PC and display it on P2 ports.

Code

```
ORG 000H
     LJMP MAIN

ORG 50H
MAIN:
          MOV P2,#00H
          MOV P1,#00H
          SETB P1.2
          CLR P1.7
          MOV TMOD,#20H
          MOV TH1,#-3
          MOV SCON,#50H
          MOV IE,#90H
          SETB TR1
   BACK:MOV C,P1.2
          MOV P1.7,C
          SJMP BACK

ORG 23H
     JNB TI,L1
     CLR TI
     L1:JNB RI,L2
     MOV A,SBUF
     MOV P2,A
     CLR RI
     L2:RETI
END
```

Output



Task 4C

Write a program using interrupts to do the following:

a) Receive data serially and sent it to P0,

b) Make timer 0 generate a square wave of 100micro second time period on P1.0.

Assume that XTAL-11.0592. Set the baud rate at 4800.

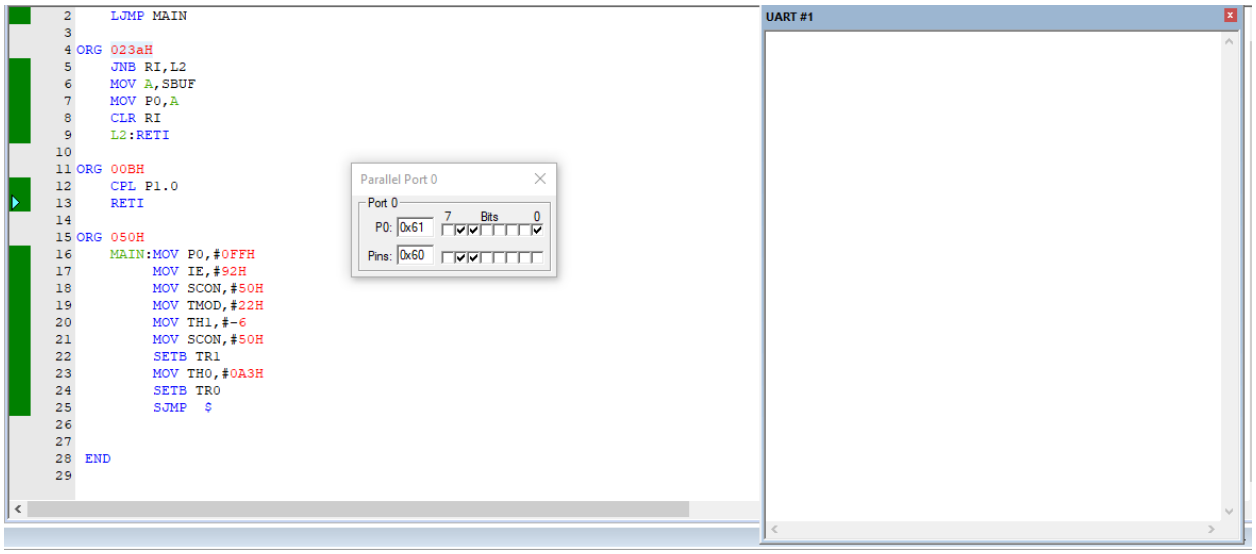
Code

```
ORG 00H
      LJMP MAIN

ORG 023H
      JNB RI,L2
      MOV A,SBUF
      MOV P0,A
      CLR RI
      L2:RETI

ORG 00BH
      CPL P1.0
      RETI
```

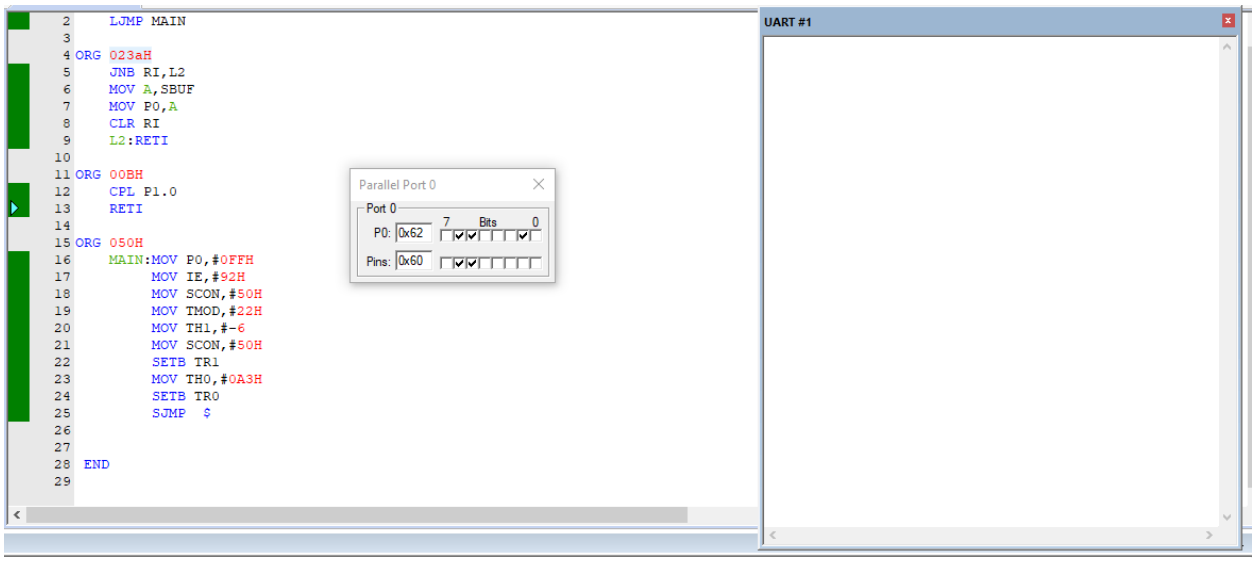
```
ORG 050H
      MAIN:MOV P0,#0FFH
           MOV IE,#92H
             MOV SCON,#50H
             MOV TMOD,#22H
             MOV TH1,#-6
             MOV SCON,#50H
             SETB TR1
             MOV TH0,#0A3H
             SETB TR0
             SJMP  $

END
```

Output

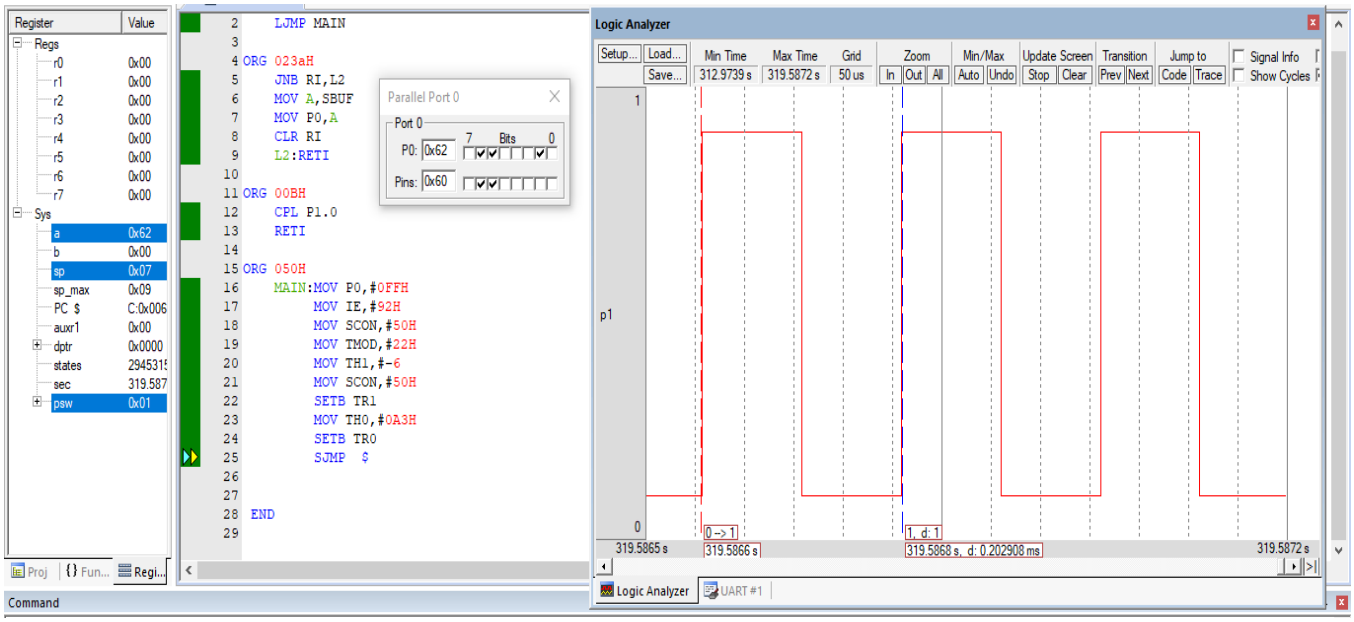
Letter ‘A’



Letter ‘B’



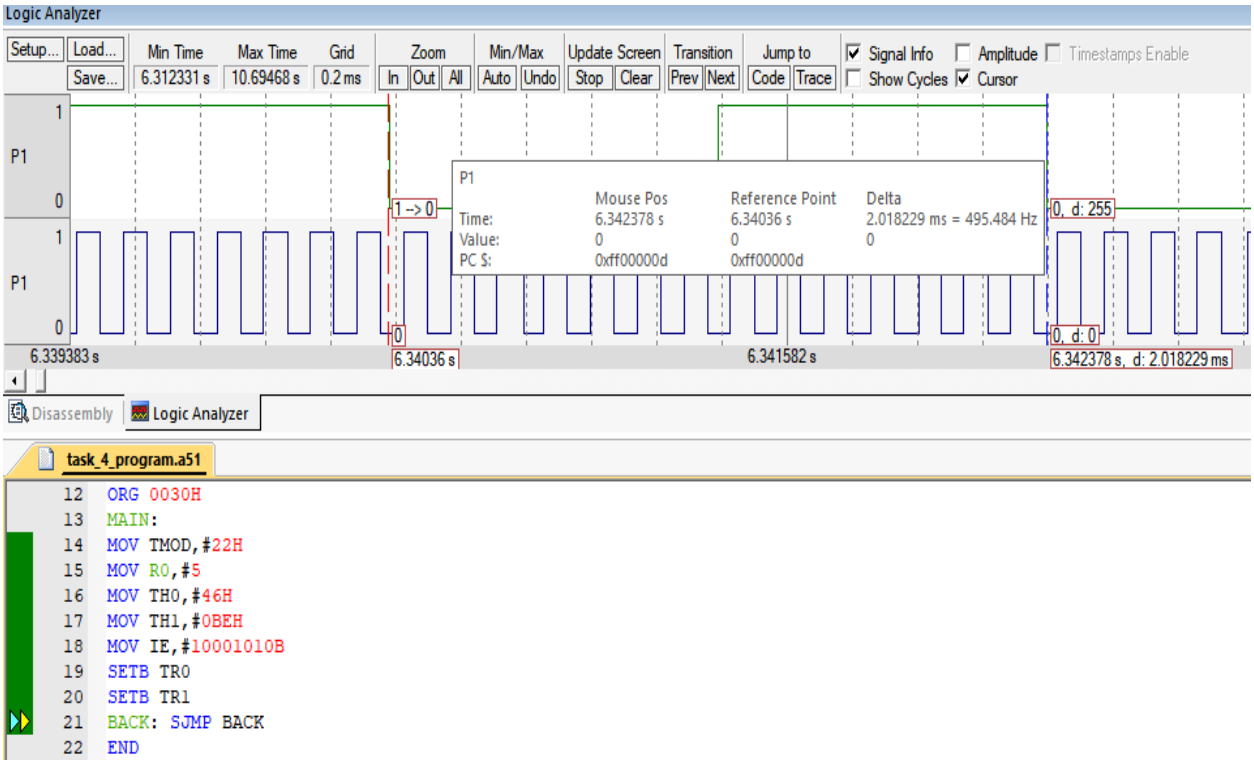
Analyzer Window Output

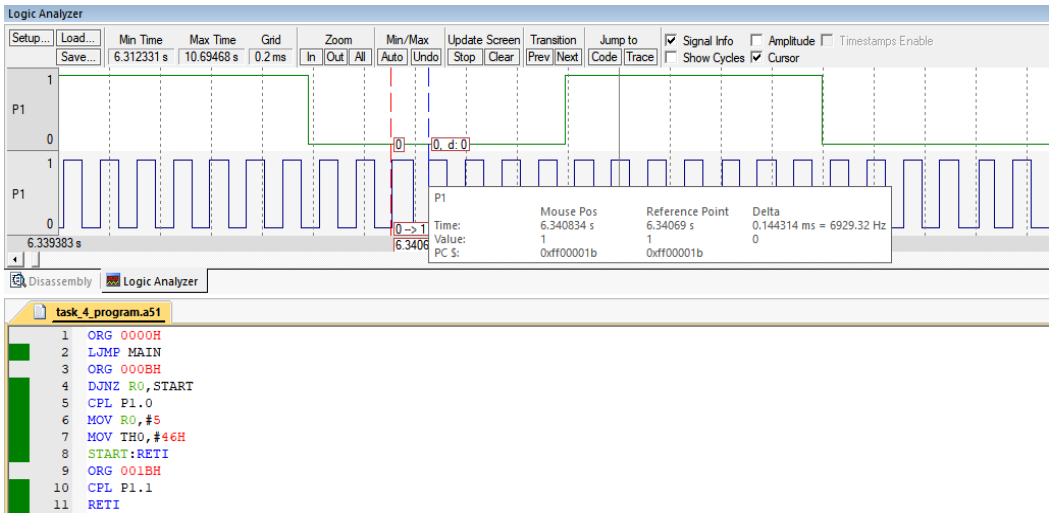


Task 4D

Write a 8051 assembly program using timer 0 to generate a 500 Hz and timer 1 to 7kHz square wave frequency on P1.0 and P1.1 respectively using Interrupts. Then examine the frequency using the KEIL IDE inbuilt Logic Analyzer.

Screenshot:





Code:

```
ORG 0000H
LJMP MAIN
ORG 000BH
DJNZ R0,START
CPL P1.0
MOV R0,#5
MOV TH0,#46H
START:RETI
ORG 001BH
CPL P1.1
RETI
ORG 0030H
MAIN:
MOV TMOD,#22H
MOV R0,#5
MOV TH0,#46H
MOV TH1,#0BEH
MOV IE,#10001010B
SETB TR0
SETB TR1
BACK: SJMP BACK
END
```