Embedded C Programming
Laboratory 5
Programs on I/O Ports

SOFTWARE TASKS:

Task 1:
Write a program to display the values 00-FF in port 1.

```c
//task 1
#include<reg51.h>
void delay_ms(unsigned int j);              //Delay function declaration
void main(void)
{
        unsigned char z;
        P1=0xFF;                            //configure Port 1 As output port.
        for(z=0;z<255;z++)                  // loop for copying 00-FF data
        {
                P1=z;                               //Send data to Port 1
                delay_ms(1000);                     //Delay= 1sec
        }
}
void delay_ms(unsigned int j)           // DELAY
{
        unsigned int i;
        for(;j>0;j--)
        {
                for(i=250;i>0;i--)
                {}
                for(i=250;i>0;i--)
                {}

        }
}
```
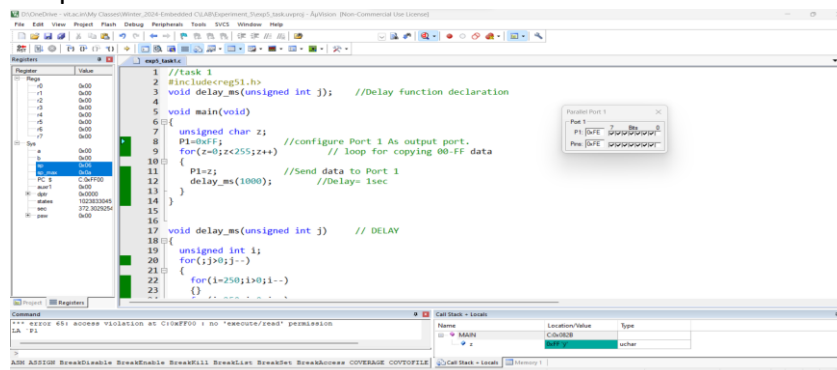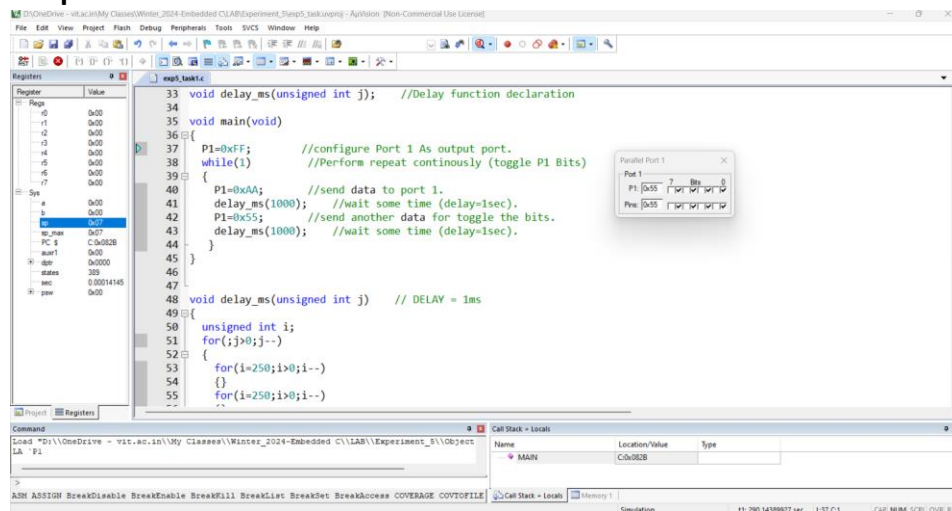
Output:

Task 2:

Write a 8051 C program to toggle all the bits of p1 continuously.

```c
//task 2
#include<reg51.h>
void delay_ms(unsigned int j);          //Delay function declaration

void main(void)
{
        P1=0xFF;                                //configure Port 1 As output port.
        while(1)                                //Perform repeat continously (toggle P1 Bits)
        {
                P1=0xAA;                //send data to port 1.
                delay_ms(1000);         //wait some time (delay=1sec).
                P1=0x55;                //send another data for toggle the bits.
                delay_ms(1000);         //wait some time (delay=1sec).
        }
}
void delay_ms(unsigned int j)   // DELAY = 1ms
{
        unsigned int i;
        for(;j>0;j--)
        {
                for(i=250;i>0;i--)
                {}
                for(i=250;i>0;i--)
                {}

        }
}
```
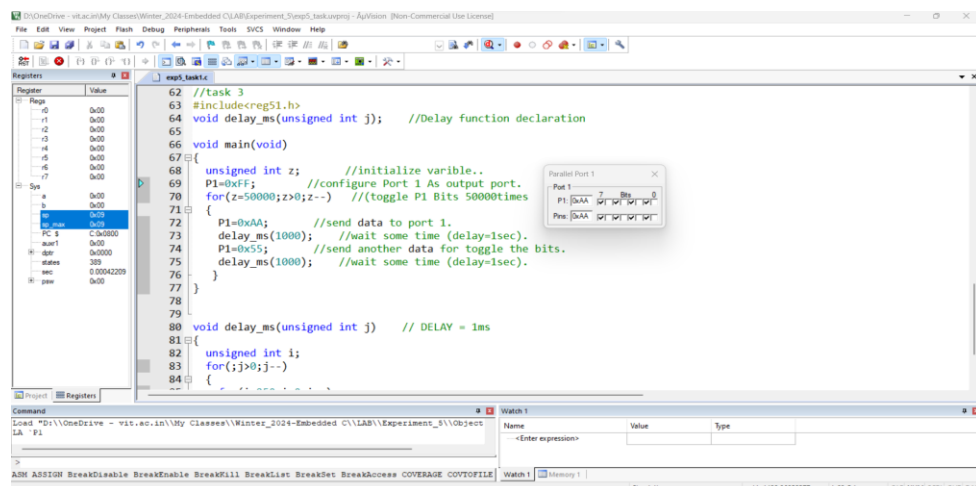
Output:

Task 3:

Write a 8051 program to toggle all bits of PORT 1 50000times.

```c
//task 3
#include<reg51.h>
void delay_ms(unsigned int j);          //Delay function declaration
void main(void)
{
        unsigned int z;                 //initialize varible..
        P1=0xFF;                            //configure Port 1 As output port.
        for(z=50000;z>0;z--)    //(toggle P1 Bits 50000times
        {
                P1=0xAA;                    //send data to port 1.
                delay_ms(1000);             //wait some time (delay=1sec).
                P1=0x55;                    //send another data for toggle the bits.
                delay_ms(1000);             //wait some time (delay=1sec).
        }
}
void delay_ms(unsigned int j)   // DELAY = 1ms
{
        unsigned int i;
        for(;j>0;j--)
        {
                for(i=250;i>0;i--)
                {}
                for(i=250;i>0;i--)
                {}

        }
}
```

Output:

Task 4:

Write a 8051 program to toggle one bits of PORT 1 50000times.

```c
//task 4
#include<reg51.h>
void delay_ms(unsigned int j);          //Delay function declaration
sbit toggle=P1^0;                       //define name for Port bit
void main(void)
{
        unsigned int z;            //initialize varible..
        P1=0xFF;                   // set all bits to high
        P1=0x00;                   //configure Port 1 As output port.
        for(z=50000;z>0;z--)    //(toggle P1 Bits 50000times
        {
                toggle=0;                   //send data to port 1 pin 0.
                delay_ms(1000);             //wait some time (delay=1sec).
                toggle=1;                   //send another data for toggle the bits.
                delay_ms(1000);             //wait some time (delay=1sec).
        }
}
void delay_ms(unsigned int j)   // DELAY = 1s
{
        unsigned int i;
        for(;j>0;j--)
        {
                for(i=250;i>0;i--)
                {}
                for(i=250;i>0;i--)
                {}

        }
}
```
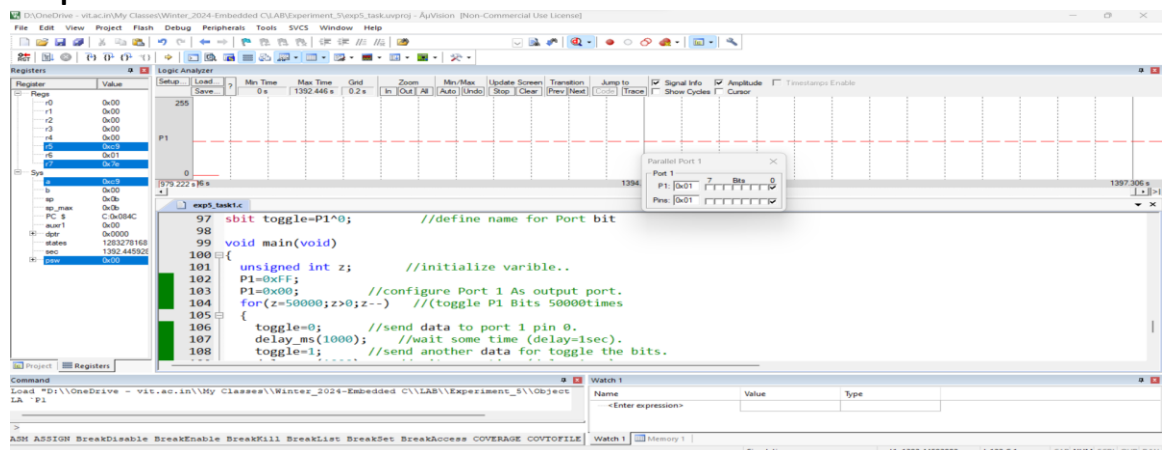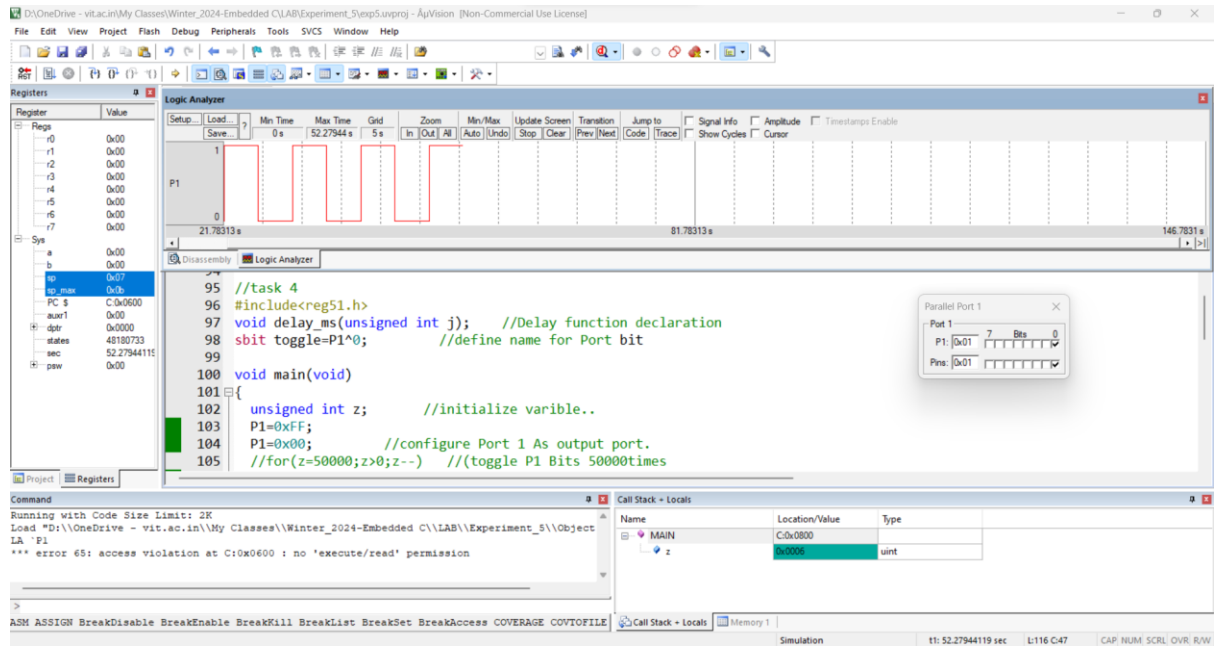
Output:

Task 5:

Try the task 4 to toggle one bits of PORT 1 for 5 times

Output: (5 times)

Task 6:

Write a 8051 program to toggle one bit of PORT 1 continuously with delay of 250ms.

```
//task 5
#include<reg51.h>
void delay_ms(unsigned int j);            //Delay function declaration
sbit toggle=P1^0;                         //define name for Port bit

void main(void)
{
        P1=0xFF;
        P1=0x00;                          //configure Port 1 As output port.
        while(1)                          //toggle P1 Bits continously.
        {
                toggle=0;                 //send data to port 1 pin 0.
                delay_ms(250);            //wait some time (delay=250msec).
                toggle=1;                 //send another data for toggle the bits.
                delay_ms(250);            //wait some time (delay=250msec).
        }
}
void delay_ms(unsigned int j)   // DELAY = 250ms
{
        unsigned int i;
        for(;j>0;j--)
        {
```

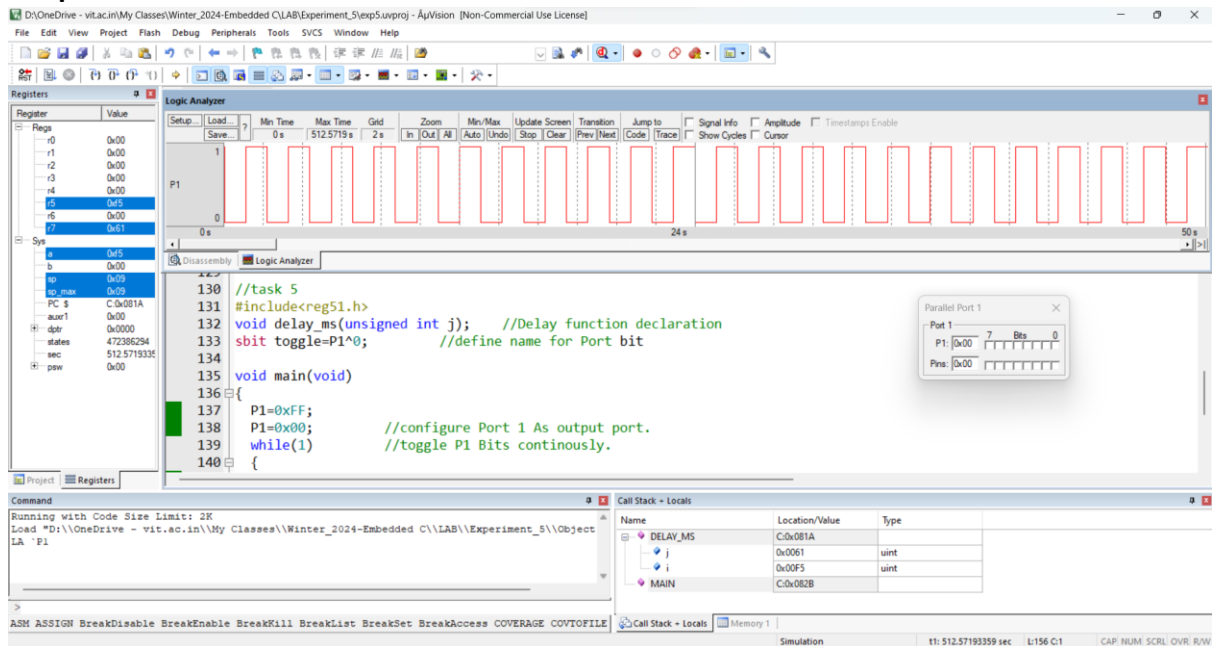```
            for(i=250;i>0;i--)
            {}
            for(i=250;i>0;i--)
            {}

    }
}
```

**Output:**



**Task 7:**

Write a 8051 program to toggle one bit of PORT 1 continuously with delay of 2000 $ms$

**HARDWARE TASKS:**

**Task 8: Write a 8051 program to toggle one bits of PORT 1 50000times and show the output in hardware using ESA MCS-8051 kit and LED.**

Program: [Same as task 4]

Procedure: Change the output to 'keil monitor' in target options after building the c program.

Output: [Paste the screenshot of hardware here]

**Task 9: Write a 8051 program to toggle one bit of PORT 1 continuously with delay of 250ms show the output in hardware using ESA MCS-8051 kit and LED.**

Program: [Same as task 6]

Procedure: Change the output to 'keil monitor' in target options after building the c program.

Output: [Paste the screenshot of hardware here]