Pratical1:

Design and develop a reprogrammable embedded computer using 8051 microcontrollers and to show the following aspects.(a)Programming (b)Execution (c)Debugging

Code:

```
 #include<reg52.H>
sbit LED = P2^0;
void Delay(void);
void main(void)
 {
 while(1)
 {
LED = 0;
Delay();
LED = 1;
Delay();
}
}
void Delay(void)
{
 int j;               int i;
for(i = 0; i < 10; i++)
{
for(j = 0; j < 10000; j++)
{
}
}
}
```

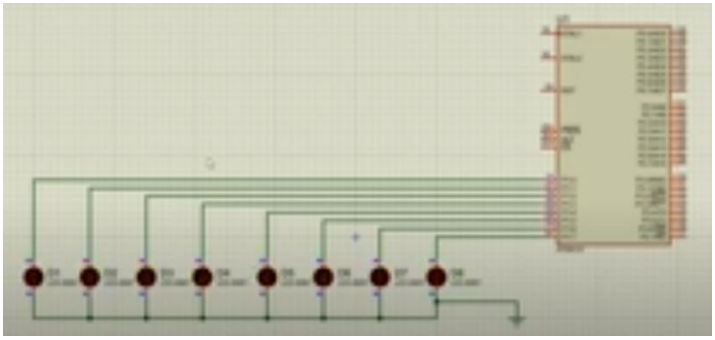
Output:

2. A	Configure timer control registers of 8051 and develop a program to generate given time delay.

Code:

```
 #include<reg51.H>
 void Delay(void);
void main(void)
 {
while(1)
 {
P1 = 0xFF; // Make all bits of P1 high
 Delay();
P1 = 0x00; // Make all bits of P1 low
 Delay();
}
 }
 void Delay(void)
 {
 int j;
 int i;
 for(i = 0; i < 1000; i++)
 {
 }
 for(j = 0; j < 1000; j++)
{
 }
 }
```

Output:



B	To demonstrate use of general purpose port i.e. Input/ output port of two controllers for data transfer between them.

Code control 1:

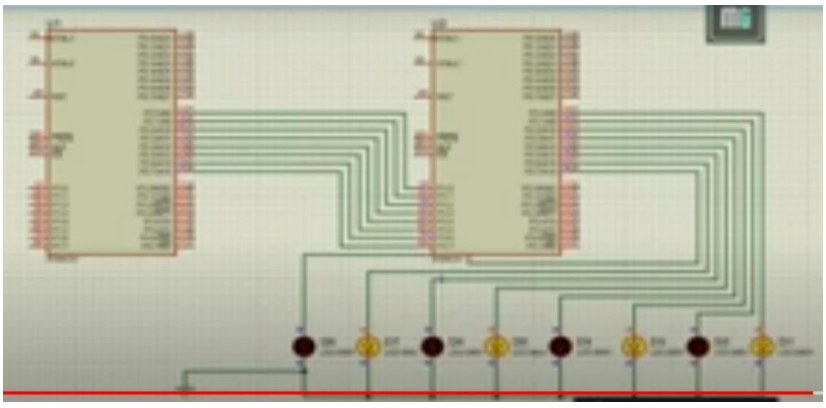
```
 #include<reg51.h>
                    void Delay(unsigned int time);
                    void main(void)
                    {
                          P2 = 0xAA;
                          Delay(1000);
                          P2 = 0x55;
                          Delay(1000);
                    }
```

```
void Delay(unsigned int time)
{
      unsigned int i,j;
      for (i = 0; i < time; i++){
            for (j = 0; j < 23; j++){
              }
       }
}
```

Control2 :

```
#include<reg51.h>


void Delay(unsigned int time);
void main(void)
{
      while(1){
             P2 = P1;
            Delay(1000);
       }
}


void Delay(unsigned int time)
{
     unsigned int i,j;
    for (i = 0; i < time; i++){
           for (j = 0; j < 23; j++){
              }
      }
}
```

Output:



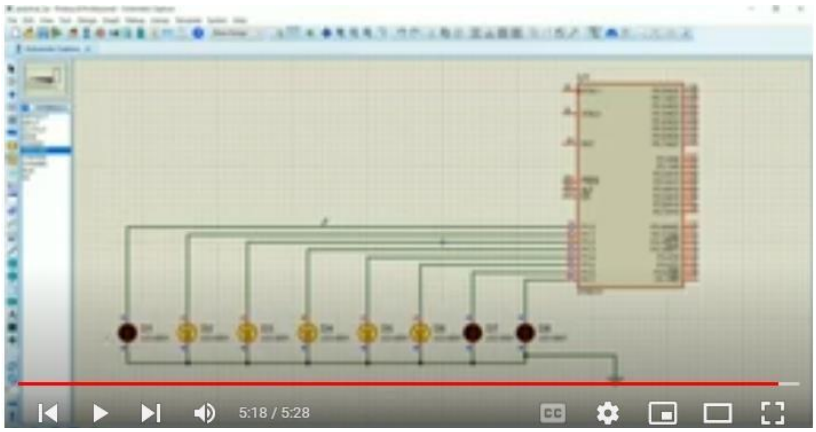
4

3. A	Port I / O: Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's

Code:

```
 #include<reg51.h>
 void delay(int time);    void main()

{
 P1 = 00000000;           while(1)

{
P1++;
delay(100);
}
}
void delay(int time)
{
int i, j;
for(i = 0; i <= time; i++)
{
for(j = 0; j <= 23; j++)
{
}
}
}
```

Output:

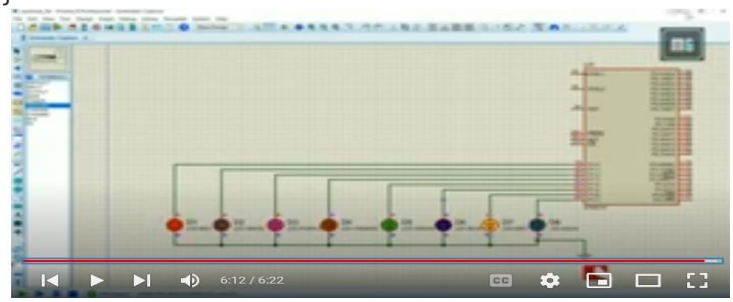


3B	To interface 8 LEDs at Input-output port and create different patterns.

Code:

```
 #include<reg51.h>
void delay();

void main()
{
 while(1)
 {
                                P1 = 0xAA; // Pattern to turn on alternate
                  10101010      LEDs -
                                delay();
                                P1 = 0x55; // Reverse the pattern
```

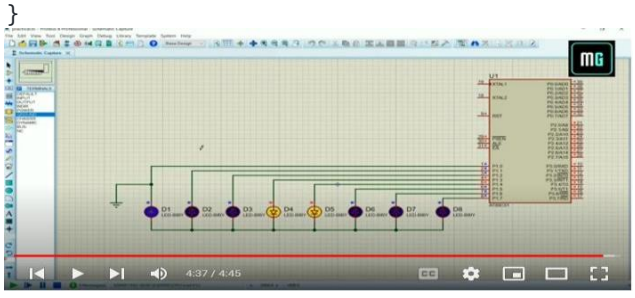
```
                                delay();
 }
}

void delay()
{
 unsigned int i, j;              for(i = 0; i <
 23; i++)
{
                                for(j = 0; j < 1000;
                                j++)
                                {
                                }
 }
}
```



3C	To demonstrate timer working in timer mode and blink LED without using any loop delay routine.

Code:

```
 #include<reg51.h>
int i = 0;

void timer_ISR(void)interrupt 1
{
i++;
if(i == 10)
{
 i=0;                          P1++;
}
 }
void main(void)
{
TMOD = 0x01;
ET0 = 1;
 TR0 = 1;             EA = 1;
       while(1);
}
```

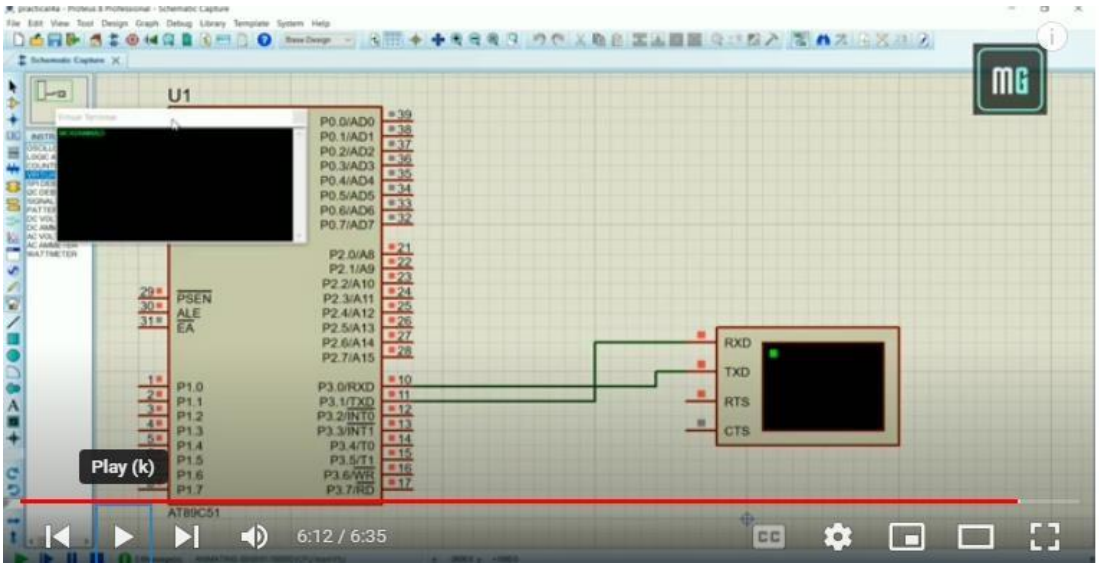


4. A	Serial I / O: Configure 8051 serial port for asynchronous serial communication with serial port of PC exchange text messages to PC and display on PC screen. Signify end of message by carriage return.

Code:

```
#include<reg51.h>


void send(char x);   void main(void)
{
                              TMOD = 0x20;
                              TH1 = 0xFD;
                              SCON = 0x50;

                              TR1 = 1;
                              send('M');
                              send('O');
                              send('H');
                              send('A');
                              send('M');
                              send('M');
                              send('A');
                              send('D');
                              while(1);
 }


void send(char x)
{
SBUF = x;
while(TI == 0);

                              TI = 0;
                        }
```

Output:

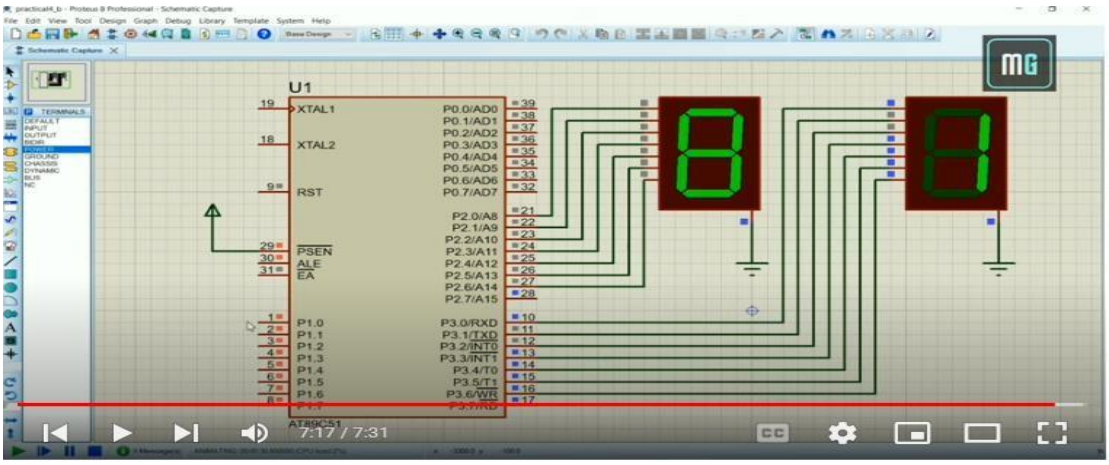


4B	To demonstrate interfacing of seven-segment LED display and generate counting from 0 to 99 with fixed time delay.

Code:

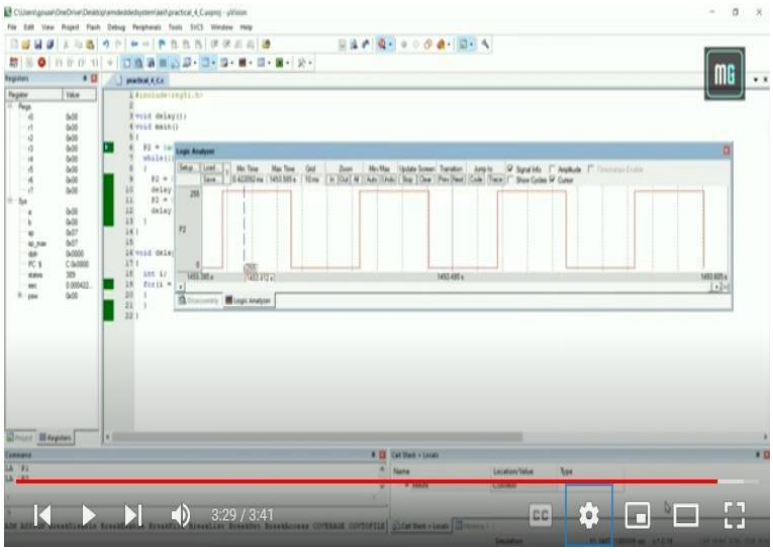
```
 #include<reg51.h>
void delay(unsigned int ms)
{
 unsigned int i, j;          for(i = 0; i<ms; i++)
{
for(j = 0; j<=1275; j++)
{
}
}
}

void main(void)
{
char number[] = {0x3F, 0x06, 0x5B, 0x4F, 0x66, 0x6D, 0x7D, 0x07,
                      0x7F, 0x6F}; int
                             i, j; P2
                             = 0x00;
                             P3 = 0x00;
                             while(1)
                             {
for(i = 0; i<=9; i++)
{
                             P2 = number[i];              for(j
                             = 0; j<=9; j++)
{
 P3 = number[j];                                  delay(50);
}
}
}
}
```

Output:



4C	Interface 8051 with D/A converter and generate square wave of given frequency on oscilloscope.

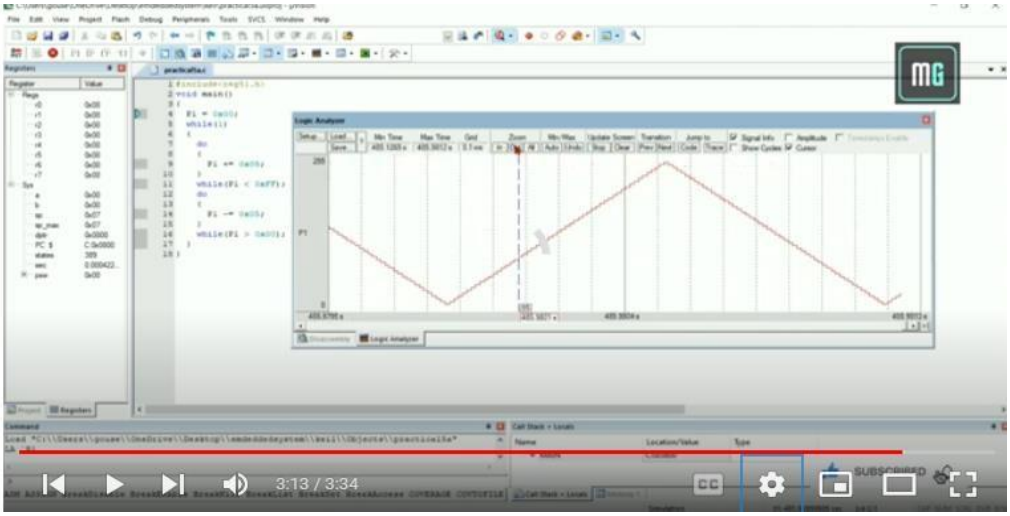
```
#include<reg51.h>
void delay();
void main()
{
P2 = 0x00;
while(1)
{
P2 = 0xFF;
delay();
P2 = 0x00;
delay();
}
}
void delay()
{
int i;
for(i = 0; i <= 5000; i++)
{
}
}
```



5. A	Interface 8051 with D/A converter and generate triangular wave of given frequency on oscilloscope.

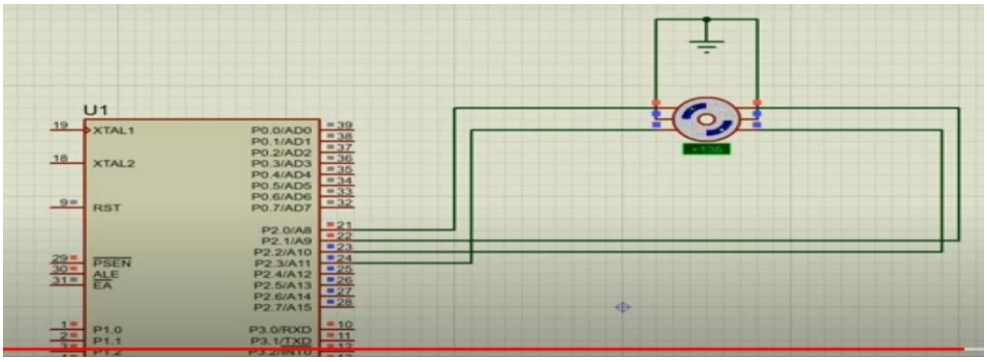
```
#include<reg51.h>
                    void main()
                    {
              P2= 0x00;             while(1)
                                {
                                      do
                                      {
                                            P2 += 0x05;
                                      } while(P2 <
                                      0xFF); do
```

```
                {
                        P2 -= 0x05;
                }
                while(P2 > 0x00);
        }
}
```



6.	Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clock wise direction.

```
#include<reg51.h>
                void delay()
                {
                        int i, j;
                        for(i = 0; i <= 100; i++)
                        {
                                for(j = 0; j < 100; j++)
                                {
                                }
                        }
}
                void main()
                {
                        while(1)
                        {
                                P2 = 0x09;
                        delay();       P2
                        = 0x03;
                        delay(); P2 =
                        0x06; delay(); P2
                        = 0x0C; delay();
                        }
                }
```




```
 #include<reg51.h>
 sbit red = P2^0;     sbit yellow = P2^1;
       sbit green = P2^2;    void
 delay(int time);     void main()
{
red = yellow = green = 0;
while(1)
{
                              red = 1;
```

7.	Generate traffic signal.

```
                              delay(1000);   red = 0;
                              yellow = 1;
                              delay(200);    yellow
                              = 0;

 green = 1;                   delay(1000);
       green = 0;

yellow = 1;                   delay(200);
       yellow = 0;
}
}

void delay(int time)
{
int i, j;
```

```
for(i = 0; i < time; i++)
{
for(j = 0; j < 1000; j++)
{
}
}
}
```