

# 8051 Microcontroller Based Traffic Signal

```
# include<reg51.h>

//In this program,the two for loops set the counter value while the function (bcd) returns the hex
// value for the counter,which is thjen assigned to the relevant port...

//The result can be on Port 0(less significant) and Port 1(more significant) or alternatively on Port 3
and Port 4...

//Preprocessor Directories

unsigned int bcd(unsigned int);
void delay(unsigned int);
void counter(unsigned int);
void initial();
void display();
void blink();

sbit red_a      =P2^0;
sbit yellow_a=P2^1;
sbit green_a =P2^2;

sbit red_b      =P2^3;
sbit yellow_b=P2^4;
sbit green_b =P2^5;

sbit red_c      =P2^6;
sbit yellow_c=P2^7;
```

```
sbit green_c =P3^0;
```

```
sbit red_d      =P3^1;
```

```
sbit yellow_d=P3^2;
```

```
sbit green_d =P3^3;
```

```
void main()
```

```
{
```

```
initial();
```

```
counter(1);
```

```
while(1)
```

```
{
```

```
red_a=0;
```

```
yellow_a=1;
```

```
counter(1);
```

```
yellow_a=0;
```

```
green_a=1;
```

```
display();
```

```
green_a=0;
```

```
red_a=1;
```

```
red_b=0;
```

```
yellow_b=1;
counter(1);
yellow_b=0;
green_b=1;
display();
```

```
green_b=0;
red_b=1;
red_c=0;
yellow_c=1;
counter(1);
yellow_c=0;
green_c=1;
display();
```

```
green_c=0;
red_c=1;
red_d=0;
yellow_d=1;
counter(1);
yellow_d=0;
green_d=1;
display();
green_d=0;red_d=1;
}
```

```
}
```

```
//function to create a bcd value on every count.
```

```
//In this Method a direct Hex value is Created for each BCD and Assigned to the Port.
```

```
//The least significant bit i.e 0(on the right side) represents decimal point..It is always kept off.
```

```
unsigned int bcd(unsigned int val)
```

```
{
```

```
unsigned int port=0;
```

```
if (val==0)
```

```
port=0xFC; //If x is set to 0
```

```
if (val==1) //If x is set to 1
```

```
port=0x60;
```

```
else if(val==2) //If x is set to 2
```

```
port=0xDA;
```

```
else if(val==3) //If x is set to 3
```

```
port=0xF2;
```

```
else if(val==4) //If x is set to 4
```

```
port=0x66;
```

```
else if(val==5) //If x is set to 5
```

```
port=0xB6;
```

```
else if(val==6)                //If x is set to 6
port=0xBE;

else if(val==7)                //If x is set to 7
port=0xE0;

else if(val==8)                //If x is set to 8
port=0xFE;

else if(val==9)                //If x is set to 9
port=0xF6;

else if(val==10)               //To switch all pins to zero.
port=0x00;

return port;                   //returning the calculated valuse to main.
}
```

```
//Function to set size of clock intervals.
```

```
void delay(unsigned int k)
```

```
{
```

```
unsigned int i;
```

```
for (i=0; i<k ; i++)
```

```
{  
    TMOD = 0x01;  
    TLO = 0x67;  
    TH0 = 0xFC;  
    TR0 = 1;  
    while(TF0==0);  
    TR0 = 0;  
    TFO = 0;  
}  
}
```

```
void counter(unsigned int a)
```

```
{  
    unsigned int i;  
    for(i=0;i<=a;i++)  
        delay(1000);  
}
```

```
void display()
```

```
{  
    unsigned int i;  
    for(i=3;i>=1;i--)  
    {  
        P1=bcd(i);  
    }
```

```
delay(1000);
```

```
}
```

```
P1=bcd(0);
```

```
}
```

```
void initial()
```

```
{
```

```
red_a=1;
```

```
red_b=1;
```

```
red_c=1;
```

```
red_d=1;
```

```
yellow_a=0;
```

```
yellow_b=0;
```

```
yellow_c=0;
```

```
yellow_d=0;
```

```
green_a=0;
```

```
green_b=0;
```

```
green_c=0;
```

```
green_d=0;
```

```
P1=bcd(0);
```

```
}
```



```
void blink()  
{  
P1=bcd(0);  
delay(30);  
P1=bcd(10);  
}
```