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Experiment 9: Design and implement an Embedded System that outputs factor of a number (input through switch) on LED with buzzer, in between every factor using 8051 Board.

Stuff Required: KEIL μ VISION IDE, 8051 microcontroller.

Program:

C code:

```
#include<p89v51rd2.h>

sbit led1=P3^0;
sbit led2=P3^1;
sbit led3=P3^6;
sbit led4=P3^7;
//led declarations
sbit sw1=P3^2;
sbit sw2=P3^3;
sbit sw3=P3^4;
sbit sw4=P3^5;
//switch declarations
sbit bzz = P0^3;

void delay(unsigned int dela) // delay function
{
    unsigned int i,j;
    for(i=0;i<=1000;i++)
        for(j=0;j<=dela;j++);
}

void buzzer(){
    bzz=0;
    delay(1000);
    bzz=1;
}

unsigned int i,j,t,num,temp;
void main(void)
{
    led1=led2=led3=led4=1;
    sw1=sw2=sw3=sw4=1; // setting all switche's default value
    num=0;
```

```

while(1)
{
    if(sw1==0) num=num+8;
    if(sw2==0) num=num+4;
    if(sw3==0) num=num+2;
    if(sw4==0) num=num+1;

    bzz=1;
    for(i = 2;i<num;i++){
        if(num%i==0){ // checking for factor
            for(j=0;j<4;++j){ // setting up leds
                temp = 1 << j;
                if(j == 0) led1 = !(temp & i);
                else if(j==1) led2 = !(temp & i);
                else if (j==2) led3 = !(temp & i);
                else led4 = !(temp & i);
            }
            delay(1500);
            buzzer();
            led1=led2=led3=led4=1;
        }
    }
}

```

HEX code:

```

:10095F00E4FDFCE4FBFAD3EB9FEA9E50070BBB00D0
:0F096F00010A80F20DBD00010CBC03E7BDE9E4F5
:01097E002256
:0C097F00C2837FE87E0312095FD283224E
:10080000D2B7D2B6D2B1D2B0D2B5D2B4D2B3D2B2BC
:10081000E4F50AF50B20B20B7408250BF50BE43553
:100820000AF50A20B30B7404250BF50BE4350AF521
:100830000A20B40B7402250BF50BE4350AF50A20E7
:10084000B508050BE50B7002050AD283750C00751F
:100850000D02C3E50D950BE50C950A50B3AC0CAD3C
:100860000DAE0AAF0B12090AED4C60030208FFF54A
:100870000EF50F7E007401A80F088005C333CE3338
:10088000CED8F9F5098E08E50F450E7011E508552B
:100890000CFEE509550D4E24FFB392B08041E50FE3
:1008A0006401450E7011E508550CFEE509550D4E25
:1008B00024FFB392B18028E50F6402450E7011E564
:1008C00008550CFEE509550D4E24FFB392B6800F76
:1008D000E508550CFEE509550D4E24FFB392B7050A
:1008E0000FE50F7002050E6404450E70867FC47E0E

```

:1008F0000912095F12097FD2B7D2B6D2B1D2B005C0

:0A0900000DE50D7002050C0208520F

:0300000002098B67

:0C098B00787FE4F6D8FD758111020800A9

:10090A00BC000BBE0029EF8DF084FFADF022E4CCD1

:10091A00F875F008EF2FFFE33FEEC33FCEE9DEC9A

:10092A00984005FCEE9DFE0FD5F0E9E4CEFD22EDE0

:10093A00F8F5F0EE8420D21CFEADF075F008EF2F2A

:10094A00FFED33FD4007985006D5F0F222C398FD1B

:05095A000FD5F0EA22B8

:00000001FF

Result:

Factors of a number are output in binary using LEDs.