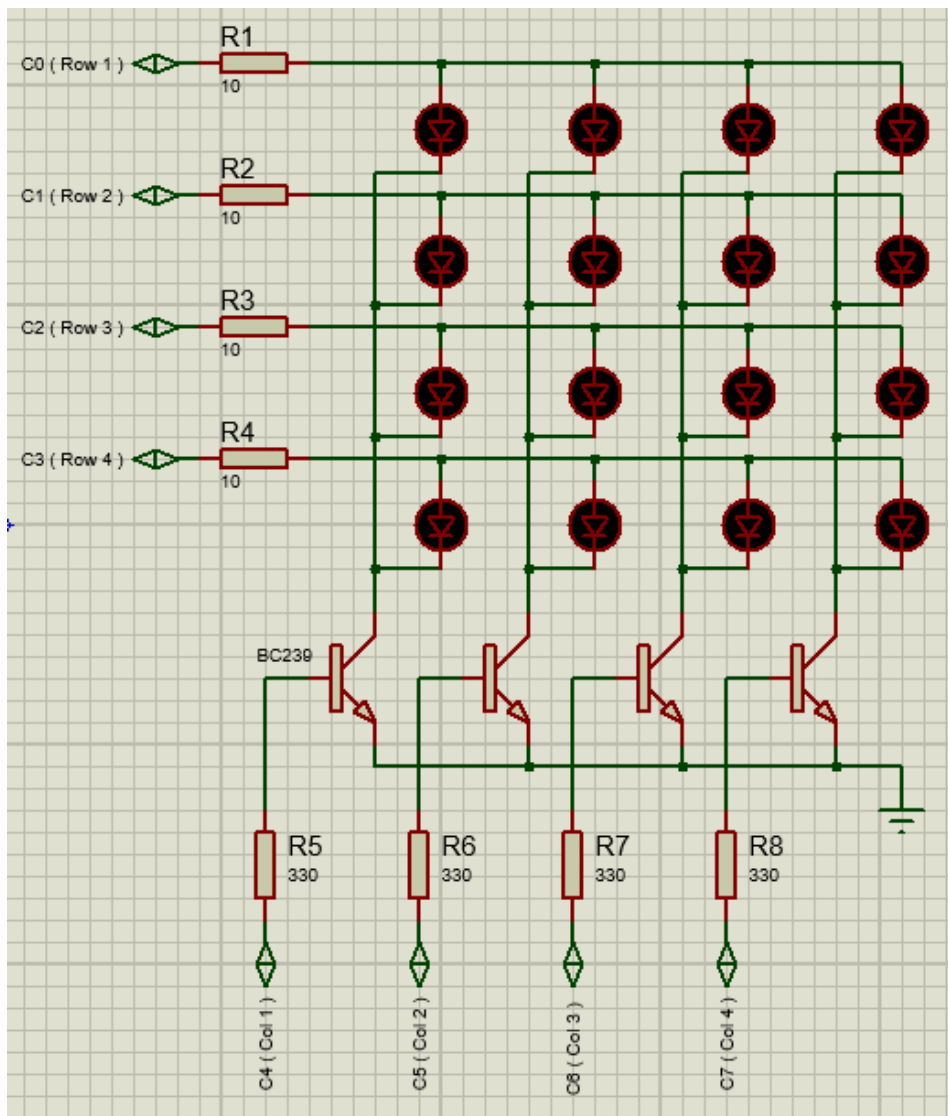
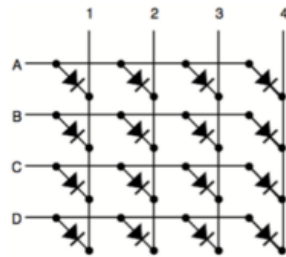


Laboratory Activity -

General Purpose Input Output on the PIC18F4520.

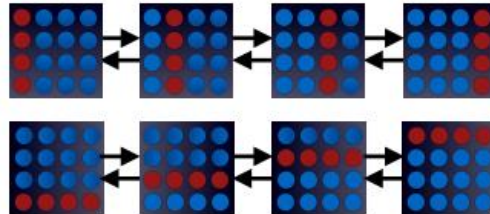
Basic Output: (PORTC)

- a. Build a circuit in PROTEUS that has 4x4 LED matrix as the depicted below.

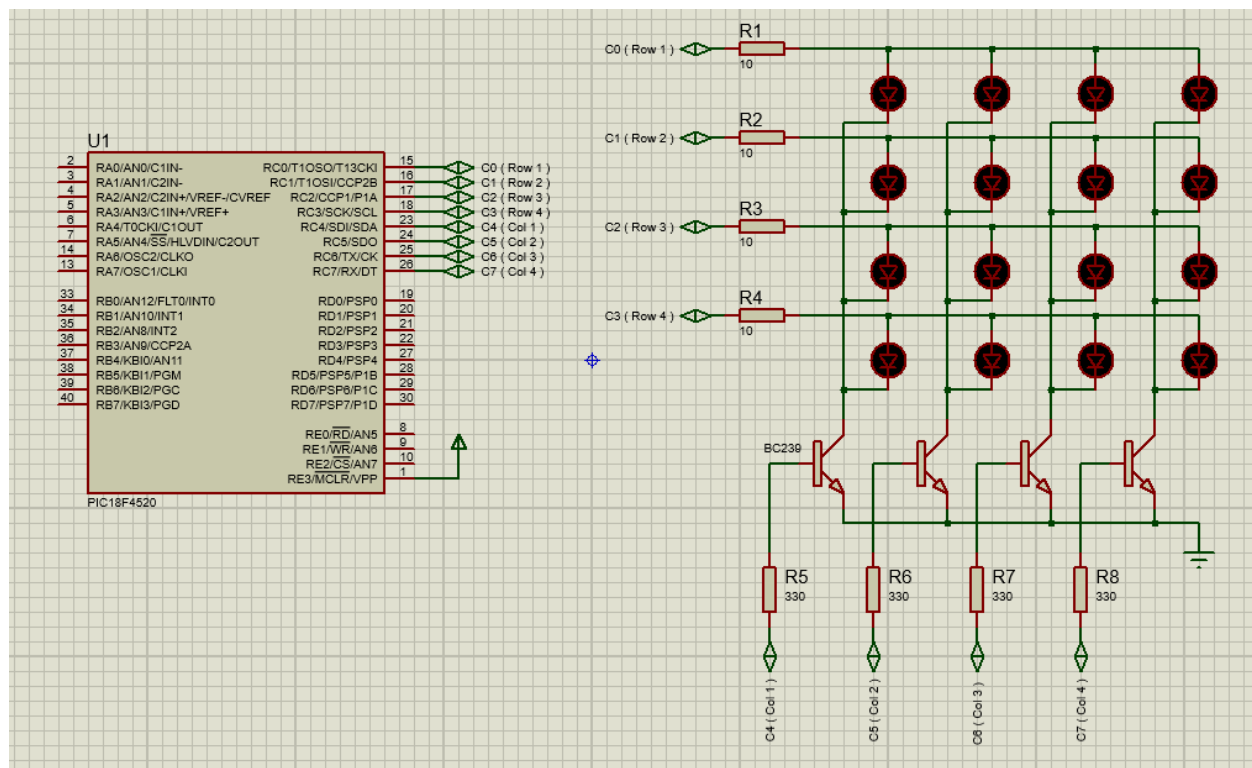


- c. Using the structure definition below to control your 4x4 LED matrix. Write a program that sweeps the columns from left to right followed by low to high and back with a in-step delay of 500ms.

```
struct myMatrix{
    int COL:4;
    int ROW:4;
};
```



- d. Simulate your matrix and show your instructor. Signature _____
- e. Attach the Proteus circuit schematic and C source code to this report.



Module 2 – Lab – James Martin

```
1 // Program to control a 4x4 LED matrix
2
3 #include <18f4520.h>
4 #use delay( clock = 2000000 ) // Set clock to 20MHz
5 #fuses HS, NOWDT, NOLVP
6
7 struct myMatrix {
8     int ROW:4;
9     int COL:4;
10 };
11
12 struct myMatrix *LATC = 0xF8B;
13 int *TRISC = 0xF94;
14
15 int main( void ) {
16
17     *TRISC = 0x00; // Make all of port C OUTPUT
18     *LATC = 0x00;
19
20     int mask = 0x01; // Mask for shifting bits
21
22     while( 1 ) {
23
24         // Chaser COL
25         for( mask = 0x01; mask <= 0x08; mask <= 1 ) {
26             LATC -> ROW = 0xF;
27             LATC -> COL = mask;
28             delay_ms( 500 );
29         }
30
31         // Chaser ROW
32         for( mask = 0x01; mask <= 0x08; mask <= 1 ) {
33             LATC -> ROW = mask;
34             LATC -> COL = 0xF;
35             delay_ms( 500 );
36         }
37
38         // Snake
39         for( mask = 0x01; mask <= 0x08; mask <= 1 ) {
40             LATC -> ROW = 0x01;
41             LATC -> COL = mask;
42             delay_ms( 500 );
43         }
44         for( mask = 0x08; mask >= 0x01; mask >= 1 ) {
45             LATC -> ROW = 0x02;
46             LATC -> COL = mask;
47             delay_ms( 500 );
48         }
49         for( mask = 0x01; mask <= 0x08; mask <= 1 ) {
50             LATC -> ROW = 0x04;
51             LATC -> COL = mask;
52             delay_ms( 500 );
53         }
54         for( mask = 0x08; mask >= 0x01; mask >= 1 ) {
55             LATC -> ROW = 0x08;
56             LATC -> COL = mask;
57             delay_ms( 500 );
58         }
59     }
60 }
61
```