

## Assignment - 5

### Problem Statement:

Write a program in C to perform basic matrix operations such as:

1. Addition of two matrices
2. Saddle point of a matrix
3. Inverse of a matrix
4. Magic square of a matrix

### Code:

```
1  #include <stdio.h>
2
3  int main()
4  {
5      int n, i, j;
6      int a[10][10], b[10][10], sum[10][10];
7      int saddle = 0;
8      int magic = 1;
9      int rowSum, colSum, diag1 = 0, diag2 = 0;
10
11     printf("Enter order of matrix: ");
12     scanf_s("%d", &n);
13
14     printf("Enter elements of Matrix A:\n");
15     for (i = 0; i < n; i++)
16         for (j = 0; j < n; j++)
17             scanf_s("%d", &a[i][j]);
18
19     printf("Enter elements of Matrix B:\n");
20     for (i = 0; i < n; i++)
21         for (j = 0; j < n; j++)
22             scanf_s("%d", &b[i][j]);
23
24     // Matrix Addition
25     printf("\nAddition of Matrices:\n");
26     for (i = 0; i < n; i++)
27     {
28         for (j = 0; j < n; j++)
29         {
30             sum[i][j] = a[i][j] + b[i][j];
31             printf("%d ", sum[i][j]);
32         }
33         printf("\n");
34     }
```

```
34     }
35
36     // Saddle Point
37     for (i = 0; i < n; i++)
38     {
39         int min = a[i][0], col = 0;
40         for (j = 1; j < n; j++)
41         {
42             if (a[i][j] < min)
43             {
44                 min = a[i][j];
45                 col = j;
46             }
47         }
48
49         int flag = 1;
50         for (j = 0; j < n; j++)
51         {
52             if (a[j][col] > min)
53             {
54                 flag = 0;
55                 break;
56             }
57         }
58
59         if (flag)
60         {
61             printf("\nSaddle Point found: %d\n", min);
62             saddle = 1;
63         }
64     }
```

```

64
65
66     if (!saddle)
67         printf("\nNo Saddle Point found\n");
68
69     // Magic Square
70     for (i = 0; i < n; i++)
71     {
72         rowSum = colSum = 0;
73         for (j = 0; j < n; j++)
74         {
75             rowSum += a[i][j];
76             colSum += a[j][i];
77         }
78         if (rowSum != colSum)
79             magic = 0;
80     }
81
82     for (i = 0; i < n; i++)
83     {
84         diag1 += a[i][i];
85         diag2 += a[i][n - i - 1];
86     }
87
88     if (diag1 != diag2)
89         magic = 0;
90
91     if (magic)
92         printf("\nMatrix is a Magic Square\n");
93     else
94         printf("\nMatrix is not a Magic Square\n");
95
96     return 0;
97 }
98

```

## Input & Output:

```

Microsoft Visual Studio Debug Console
Enter order of matrix: 2
Enter elements of Matrix A:
1 2
3 4
Enter elements of Matrix B:
5 6
7 8

Addition of Matrices:
6 8
10 12

Saddle Point found: 3

Matrix is not a Magic Square

D:\MIT\Sem2\FOP\Leap Year\x64\Debug\Leap Year.exe (process 7364) exited with code 0 (0x0).
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```