

# 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     }
```

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```

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64
65     if (!saddle)
66         printf("\nNo Saddle Point found\n");
67
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 + ▾
1 Enter order of matrix: 2
2 Enter elements of Matrix A:
3 1 2
4 3 4
5 Enter elements of Matrix B:
6 5 6
7 7 8
8
9 Addition of Matrices:
10 6 8
11 10 12
12
13 Saddle Point found: 3
14
15 Matrix is not a Magic Square
16
17 D:\MIT\Sem2\FOP\Leap Year\x64\Debug\Leap Year.exe (process 7364) exited with code 0 (0x0).
18 To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
19 le when debugging stops.
20 Press any key to close this window . . .

```