

# Assignment Lab 8

QNO.1 Write a C program that generates a sequence of prime numbers within a given range using nested loops.

```
PFlab > lab8 > C lab8q1.c > main(void)
1  #include<stdio.h>
2  int main(void)
3  {
4      int n;
5      printf("Enter the number: ");
6      scanf("%d",&n);
7      for(int i=2;i<=n;i++)
8      {
9          int count = 0;
10         for(int j=1;j<=i;j++)
11         {
12             if(i % j == 0)
13             {
14                 count++;
15             }
16         }
17         if(count == 2)
18         {
19             printf("%d ",i);
20         }
21     }
22
23     return 0;
24 }
25
```

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PS C:\UNI ASSIGNMENT\pflab\lab8> .\lab8q1  
Enter the number: 23  
2 3 5 7 11 13 17 19 23

QNO.2 Generate a pattern of odd numbers in decreasing order starting from a user-specified number using nested loops.

```
PFlab > lab8 > C lab8q2.c > main()
1  #include <stdio.h>
2
3  int main() {
4      int n;
5      printf("Enter the number: ");
6      scanf("%d",&n);
7      if(n % 2 != 0)
8      {
9          for(int i=n;i>=1;i-=2)
10         {
11             for(int j=i;j>=1;j-=2)
12             {
13                 printf("%d ",j);
14             }
15             printf("\n");
16         }
17     }
18
19     return 0;
20 }
```

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```
PS C:\UNI ASSIGNMENT\pflab\lab8> .\lab8q2
Enter the number: 9
9 7 5 3 1
7 5 3 1
5 3 1
3 1
1
```

QNO.3 Write a C program to find the saddle point(s) in a given 3x3 matrix. A saddle point is an element that is the smallest in its row and the largest in its column.

```
PS/leh > lab8 > C lab8.c > main()
1  #include <stdio.h>
2
3  int min(int mat[], int n){
4      int minimum = mat[0];
5      int position = 0;
6      for(int i = 0; i < n; i++){
7          if(mat[i] < minimum){
8              minimum = mat[i];
9              position = i;
10         }
11     }
12     return position;
13 }
14
15 int main() {
16     int nr,nc;
17     printf("Enter the number of rows: ");
18     scanf("%d",&nr);
19     printf("Enter the number of columns: ");
20     scanf("%d",&nc);
21     int mat[nr][nc];
22     for(int i=0; i<nr;i++){
23         {
24             for(int j=0;j<nc;j++){
25                 {
26                     scanf("%d",&mat[i][j]);
27                 }
28             }
29             printf("\n");
30             for(int i=0; i<nr;i++){
31                 {
32                     for(int j=0;j<nc;j++){
33                         {
34                             printf("%d ",mat[i][j]);
35                         }
36                     }
37                     printf("\n");
38                 }
39             }
40             for(int i =0;i<nr;i++){
41                 int min_position = min(mat[i],nr);
42                 int minimum = mat[i][min_position];
43                 int maximum = minimum;
44                 for(int j = 0;j<nc;j++){
45                     if(mat[j][min_position] > maximum){
46                         maximum = mat[j][min_position];
47                     }
48                 }
49                 if(maximum == minimum){
50                     printf("The saddle in this Matrix is : %d",maximum);
51                 }
52             }
53         }
54     }
55 }
```

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3  
5  
3  
2  
7  
4  
9

2 3 5  
3 2 7  
8 4 9

The saddle in this Matrix is : 4

QNO.4 Write a C program to multiply two matrices of size 3x3 and display the result matrix.

```
PFab> lsB8 > C h88qLc > main()
1  #include <stdio.h>
2
3  int main()
4  {
5      int nr, nc;
6      printf("Enter the number of rows: ");
7      scanf("%d", &nr);
8      printf("Enter the number of columns: ");
9      scanf("%d", &nc);
10     int mat1[nr][nc];
11     int mat2[nr][nc];
12     int mat3[nr][nc];
13     for (int i = 0; i < nr; i++)
14     {
15         for (int j = 0; j < nc; j++)
16         {
17             scanf("%d", &mat1[i][j]);
18         }
19     }
20     printf("\n");
21     for (int i = 0; i < nr; i++)
22     {
23         for (int j = 0; j < nc; j++)
24         {
25             scanf("%d", &mat2[i][j]);
26         }
27     }
28     printf("First Matrix:\n");
29     printf("\n");
30     for (int i = 0; i < nr; i++)
31     {
32         for (int j = 0; j < nc; j++)
33         {
34             printf("%d ", mat1[i][j]);
35         }
36         printf("\n");
37     }
38     printf("\n");
39     printf("Second Matrix:\n");
40     for (int i = 0; i < nr; i++)
41     {
42         for (int j = 0; j < nc; j++)
43         {
44             printf("%d ", mat2[i][j]);
45         }
46         printf("\n");
47     }
48     printf("\n");
49     for (int i = 0; i < nr; i++)
50     {
51         for (int j = 0; j < nc; j++)
52         {
53             mat3[i][j] = 0;
54         }
55     }
56     for (int i = 0; i < nr; i++)
57     {
58         for (int j = 0; j < nc; j++)
59         {
60             for (int k = 0; k < nr; k++)
61             {
62                 mat3[i][j] += mat1[i][k] * mat2[k][j];
63             }
64         }
65     }
66     printf("\n");
67     printf("Multiplication matrix:\n");
68     for (int i = 0; i < nr; i++)
69     {
70         for (int j = 0; j < nc; j++)
71         {
72             printf("%d ", mat3[i][j]);
73         }
74         printf("\n");
75     }
76     return 0;
77 }
78 }
```

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2  
1  
First Matrix:  
  
1 2 3  
4 5 6  
7 8 9  
  
Second Matrix:  
9 8 7  
6 5 4  
3 2 1  
  
Multiplication matrix:  
30 24 18  
84 60 54  
110 114 90

QNO.5 Write a C program to generate a diamond shape pattern using nested loops. The program should take the number of rows for the upper half of the diamond as input from the user.

```
PFlab > lab8 > C lab8q5.c > main()
1  #include <stdio.h>
2
3  int main()
4  {
5      for(int i=1;i<=4;i++)
6      {
7          for(int s=1;s<=4-i;s++)
8          {
9              printf(" ");
10         }
11         for(int j=1;j<=i;j++)
12         {
13             printf("* ");
14         }
15         printf("\n");
16     }
17     for(int i=4-1;i>=1;i--)
18     {
19         for(int s=1;s<=4-i;s++)
20         {
21             printf(" ");
22         }
23         for(int j=1;j<=i;j++)
24         {
25             printf("* ");
26         }
27         printf("\n");
28     }
29     return 0;
30 }
```

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```
PS C:\UNI ASSIGNMENT\pflab\lab8> .\lab8q5
*
* *
* * *
* * * *
* * *
* *
*
```