

TASK#4:

```
main.c
```

```
1 #include<stdio.h>
2
3 int main() {
4     int a[3][3];
5     int i, j;
6     int upper = 1, lower = 1;
7
8     printf("Enter elements of 3x3 matrix:\n");
9     for(i=0;i<3;i++){
10         for(j=0;j<3;j++){
11             scanf("%d",&a[i][j]);
12         }
13     }
14
15     for(i=1;i<3;i++){
16         for(j=0;j<i;j++){
17             if(a[i][j] != 0)
18                 upper=0;
19         }
20     }
21
22     for(i=0;i<3;i++){
23         for(j=i+1;j<3;j++){
24             if(a[i][j] != 0)
25                 lower=0;
26         }
27     }
28
29     if(upper == 1)
30         printf("The matrix is an Upper Triangular Matrix.\n");
31     else if(lower == 1)
32         printf("The matrix is a Lower Triangular Matrix.\n");
33     else
34         printf("The matrix is Neither Upper nor Lower Triangular.\n");
35
36     return 0;
37 }
```

```
Enter elements of 3x3 matrix:
3
4
5
8
4
9
4
3
2
Result: The matrix is Neither Upper nor Lower Triangular.
...Program finished with exit code 0
Press ENTER to exit console.
```

TASK #5:

TASK#6:

```
main.c | Enter elements of 3x3 matrix:  
1 #include <stdio.h>  
2  
3 int main() {  
4     int arr[3][3], trans[3][3];  
5     int i, j;  
6  
7     printf("Enter elements of 3x3 matrix:\n");  
8     for(i=0; i<3; i++){  
9         for(j=0; j<3; j++){  
10            scanf("%d", &arr[i][j]);  
11        }  
12    }  
13  
14    for(i=0; i<3; i++){  
15        for(j=0; j<3; j++){  
16            trans[j][i] = arr[i][j];  
17        }  
18    }  
19  
20    printf("\nOriginal Matrix:  
21    for(i=0; i<3; i++){  
22        for(j=0; j<3; j++){  
23            printf("%d ", arr[i][j]);  
24        }  
25        printf("\n");  
26    }  
27  
28    printf("\nTransposed Matrix:  
29    for(i=0; i<3; i++){  
30        for(j=0; j<3; j++){  
31            printf("%d ", trans[i][j]);  
32        }  
33        printf("\n");  
34    }  
35  
36    return 0;  
37 }  
38
```

4
3
5
7
4
8
6
4
8

Original Matrix:
4 3 5
7 4 8
6 4 8

Transposed Matrix:
4 7 6
3 4 4
5 8 8

...Program finished with exit code 0
Press ENTER to exit console.□

TASK#7:

```
main.c | Enter elements of first 3x3 matrix:  
1 #include <stdio.h>  
2  
3 int main() {  
4     int a[3][3], b[3][3], c[3][3];  
5     int i, j, k;  
6  
7     printf("Enter elements of first 3x3 matrix:\n");  
8     for(i=0;i<3;i++)  
9         for(j=0;j<3;j++)  
10            scanf("%d",&a[i][j]);  
11  
12     printf("Enter elements of second 3x3 matrix:\n");  
13     for(i=0;i<3;i++)  
14         for(j=0;j<3;j++)  
15            scanf("%d",&b[i][j]);  
16  
17     for(i=0;i<3;i++){  
18         for(j=0;j<3;j++){  
19             c[i][j]=0;  
20             for(k=0;k<3;k++){  
21                 c[i][j] =c[i][j] + a[i][k] * b[k][j];  
22             }  
23         }  
24     }  
25  
26     printf("\nResultant Matrix:  
27     for(i=0;i<3;i++){  
28         for(j=0;j<3;j++){  
29             printf("%d ", c[i][j]);  
30         }  
31         printf("\n");  
32     }  
33     return 0;  
34 }
```

5
6
5
9
4
7
3
9
6

Enter elements of second 3x3 matrix:
4
9
7
4
8
6
7
2
1

Resultant Matrix:
79 103 76
101 127 94
90 111 81

...Program finished with exit code 0
Press ENTER to exit console.□

TASK#8:

```
main.c | Enter 3x3 matrix elements:
1 #include <stdio.h>
2
3 int main() {
4     int a[3][3];
5     int i, j, even=0, odd=0, Positive=0, Negative=0, zero=0;
6
7     printf("Enter 3x3 matrix elements:\n");
8     for(i=0;i<3;i++){
9         for(j=0;j<3;j++){
10            scanf("%d",&a[i][j]);
11        }
12    }
13
14    for(i=0;i<3;i++){
15        for(j=0;j<3;j++){
16            if(a[i][j] % 2 == 0)
17                even++;
18            else
19                odd++;
20
21            if(a[i][j] > 0)
22                Positive++;
23            else if(a[i][j] < 0)
24                Negative++;
25            else
26                zero++;
27        }
28    }
29
30    printf("\nEvenCount: %d\nOddCount: %d\nPositive number: %d\nNegative number: %d\nZero: %d\n", even, odd, Positive, Negative, zero);
31
32    return 0;
33 }
```

...Program finished with exit code 0
Press ENTER to exit console.

TASK#9:

```
main.c | Enter 3x3 matrix:
1 #include <stdio.h>
2
3 int main() {
4     int a[3][3], r[3][3];
5     int i, j;
6     int same = 1;
7
8     printf("Enter 3x3 matrix:\n");
9     for(i=0;i<3;i++)
10        for(j=0;j<3;j++)
11            scanf("%d",&a[i][j]);
12
13    for(i=0;i<3;i++){
14        for(j=0;j<3;j++){
15            r[j][2-i] = a[i][j];
16        }
17    }
18
19    printf("\nRotated Matrix is 90 Degree Clockwise:\n");
20    for(i=0;i<3;i++){
21        for(j=0;j<3;j++){
22            printf("%d ", r[i][j]);
23        }
24        printf("\n");
25    }
26
27    for(i=0;i<3;i++)
28        for(j=0;j<3;j++)
29            if(a[i][j] != r[i][j])
30                same = 0;
31
32    if(same)
33        printf("\nRotated matrix is SAME! \n");
34    else
35        printf("\nRotated matrix is DIFFERENT! \n");
36
37    return 0;
38 }
```

Rotated Matrix is 90 Degree Clockwise:
3 5 3
6 9 5
8 6 7

Rotated matrix is DIFFERENT!

...Program finished with exit code 0
Press ENTER to exit console.

TASK#10:

The screenshot shows a terminal window with two panes. The left pane contains the source code for a C program named `main.c`. The right pane shows the output of running the program.

Code (main.c):

```
1 #include <stdio.h>
2
3 int main() {
4     int n, i, j, num=1;
5
6     printf("Enter number of rows: ");
7     scanf("%d", &n);
8
9     for(i = 0; i < n; i++) {
10        for(j = 0; j < n-i-1; j++) {
11            printf(" ");
12        }
13        num=1;
14        for(j = 0; j <= i; j++) {
15            printf("%4d", num);
16            num = num * (i - j) / (j + 1);
17        }
18        printf("\n");
19    }
20
21    return 0;
22 }
```

Output:

```
Enter number of rows: 5
      1
     1   1
    1   2   1
   1   3   3   1
  1   4   6   4   1
...Program finished with exit code 0
Press ENTER to exit console.
```