MUHAMMAD ABUBAKR

25K-0503

BCS-1K

TASK#4:

main.c

```c
#include<stdio.h>

int main() {
    int a[3][3];
    int i, j;
    int upper = 1, lower = 1;

    printf("Enter elements of 3x3 matrix:\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            scanf("%d",&a[i][j]);
        }
    }

    for(i=1;i<3;i++){
        for(j=0;j<i;j++){
            if(a[i][j] != 0)
                upper=0;
        }
    }

    for(i=0;i<3;i++){
        for(j=i+1;j<3;j++){
            if(a[i][j] != 0)
                lower=0;
        }
    }

    if(upper == 1)
        printf("The matrix is an Upper Triangular Matrix.\n");
    else if(lower == 1)
        printf("The matrix is a Lower Triangular Matrix.\n");
    else
        printf("The matrix is Neither Upper nor Lower Triangular.\n");

    return 0;
}
```

```
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:

main.c

```c
#include <stdio.h>

int main() {
    int i, j, space,n;
    printf("Enter number of rows:");
    scanf("%d",&n);

    for (i = 1; i <= n; i++) {
        for (space = 5; space > i; space--) {
            printf(" ");

        }
        for (j = 1; j <= (2 * i - 1); j++) {

            printf("*");

        }
        printf("\n");
    }

    for (i = n; i >= 1; i--) {
        for (space = 5; space > i; space--) {
            printf(" ");
        }
        for (j = 1; j <= (2 * i - 1); j++) {
            printf("*");
        }
        printf("\n");
    }

    return 0;
}
```

```
Enter number of rows:5
    *
   ***
  *****
 *******
*********
*********
 *******
  *****
   ***
    *


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

TASK#6:

main.c

```c
#include <stdio.h>

int main() {
    int arr[3][3], trans[3][3];
    int i, j;

    printf("Enter elements of 3x3 matrix:\n");
    for(i=0; i<3; i++){
        for(j=0; j<3; j++){
            scanf("%d", &arr[i][j]);
        }
    }

    for(i=0; i<3; i++){
        for(j=0; j<3; j++){
            trans[j][i] = arr[i][j];
        }
    }

    printf("\nOriginal Matrix:\n");
    for(i=0; i<3; i++){
        for(j=0; j<3; j++){
            printf("%d ", arr[i][j]);
        }
        printf("\n");
    }

    printf("\nTransposed Matrix:\n");
    for(i=0; i<3; i++){
        for(j=0; j<3; j++){
            printf("%d ", trans[i][j]);
        }
        printf("\n");
    }

    return 0;
}
```

```
Enter elements of 3x3 matrix:
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

```c
#include <stdio.h>

int main() {
    int a[3][3], b[3][3], c[3][3];
    int i, j, k;

    printf("Enter elements of first 3x3 matrix:\n");
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            scanf("%d",&a[i][j]);

    printf("Enter elements of second 3x3 matrix:\n");
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            scanf("%d",&b[i][j]);

    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            c[i][j]=0;
            for(k=0;k<3;k++){
                c[i][j] =c[i][j] + a[i][k] * b[k][j];
            }
        }
    }

    printf("\nResultant Matrix:\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            printf("%d ", c[i][j]);
        }
        printf("\n");
    }
    return 0;
}
```

```
Enter elements of first 3x3 matrix:
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

```c
#include <stdio.h>

int main() {
    int a[3][3];
    int i, j, even=0, odd=0, Positive=0, Negative=0, zero=0;

    printf("Enter 3x3 matrix elements:\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            scanf("%d",&a[i][j]);
        }
    }

    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            if(a[i][j] % 2 == 0)
            even++;
            else
            odd++;

            if(a[i][j] > 0)
            Positive++;
            else if(a[i][j] < 0)
            Negative++;
            else
            zero++;
        }
    }

    printf("\nEvencount: %d\nOddcount: %d\nPositive number: %d\nNegative number: %d\nZero: %d\n", even, odd, Positive, Negative, zero);

    return 0;
}
```

```
Enter 3x3 matrix elements:
4
8
7
5
6
4
9
3
5

Evencount: 4
Oddcount: 5
Positive number: 9
Negative number: 0
Zero: 0


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

TASK#9:

main.c

```c
#include <stdio.h>

int main() {
    int a[3][3], r[3][3];
    int i, j;
     int same = 1;

    printf("Enter 3x3 matrix:\n");
    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            scanf("%d",&a[i][j]);

    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            r[j][2-i] = a[i][j];
        }
    }

    printf("\nRotated Matrix is 90 Degree Clockwise:\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            printf("%d ", r[i][j]);
        }
        printf("\n");
    }

    for(i=0;i<3;i++)
        for(j=0;j<3;j++)
            if(a[i][j] != r[i][j])
                same = 0;

    if(same)
        printf("\nRotated matrix is SAME! \n");
    else
        printf("\nRotated matrix is DIFFERENT! \n");

    return 0;
}
```

```
Enter 3x3 matrix:
3
5
7
5
9
6
3
6
8

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:

main.c

```c

#include <stdio.h>

int main() {
    int n, i, j, num=1;

    printf("Enter number of rows: ");
    scanf("%d", &n);

    for(i = 0; i < n; i++) {
        for(j = 0; j < n-i-1; j++) {
            printf("  ");
        }
 num=1;
        for(j = 0; j <= i; j++) {
            printf("%4d", num);
            num = num * (i - j) / (j + 1);
        }
        printf("\n");
    }

    return 0;
}
```

```
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.
```