Week 8

Q1)

main.c

Share Run

```c
#include <stdio.h>

int main() {
    printf("Enter number of rows: ");
    int rows;
    scanf("%d", &rows);
    for(int i=1; i<=rows; i++) {
        for(int j=1; j<=i; j++) {
            printf("%d ", j);
        }
        printf("\n");
    }
    return 0;
}
```

Output

```
/tmp/O5pIHDn2A2.o
Enter number of rows: 5
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5


=== Code Execution Successful ===
```

Q2)

main.c

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```c
#include <stdio.h>

int main () {

    int matrix[3][3];

    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            printf("Enter input [%d][%d]: ", i, j);
            scanf("%d", &matrix[i][j]);
        }
    }

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

    printf("\nTranspose of this matrix is:\n");
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            printf("%d ", matrix[j][i]);
        }
        printf("\n");
    }

    return 0;
```

Output

```
Enter input [0][2]: 4
Enter input [1][0]: 5
Enter input [1][1]: 4
Enter input [1][2]: 5
Enter input [2][0]: 6
Enter input [2][1]: 7
Enter input [2][2]: 2

Original matrix is:
2 3 4
5 4 5
6 7 2

Transpose of this matrix is:
2 5 6
3 4 7
4 5 2
```

Q3)

main.c

Share Run

```c
#include <stdio.h>
int main () {
    int matrix[2][3][3] = { {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}},
        {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}} };

    int page = 1;
    for (int k=0; k<2; k++) {
        int sum=0;
        for (int i=0; i<3; i++) {
            for (int j=0; j<3; j++){
                sum += matrix[k][i][j];
            }
        }
        printf("Sum of Elements in Matrice %d: %d", page, sum);
        printf("\n\n");
        page++;
    }
```

Output

```
/tmp/JigT7g4YAF.o
Sum of Elements in Matrice 1: 45

Sum of Elements in Matrice 2: 45



=== Code Execution Successful ===
```

Q4)

main.c

Share Run

```c
#include <stdio.h>

int main() {
    printf("Enter start of range: ");
    int num1;
    scanf("%d", &num1);
    printf("Enter end of range: ");
    int num2;
    scanf("%d", &num2);

    for (int i=num1; i<=num2; i++) {
        int counter = 0;
        for (int j=1; j<=i; j++) {
            if (i%j==0) counter++;
        }
        if (counter==2) printf("\n%d is a prime number", i);
    }

    return 0;
```

Output

```
/tmp/AvFtgWuBXe.o
Enter start of range: 34
Enter end of range: 55

37 is a prime number
41 is a prime number
43 is a prime number
47 is a prime number
53 is a prime number

=== Code Execution Successful ===
```

Q5)

main.c

Share Run

```c
#include <stdio.h>

int main() {
    printf("Enter a number: ");
    int num;
    scanf("%d", &num);
    int oddnums;
    if (num%2==0) num--;

    for (int i=num; i>0; i--) {
        for (int j=num; j>num-i-1; j--) {
            printf(" ");
        }
        for (int k=0; k<=num-i; k++) {
            if (i%2!=0) printf("%d ", i);
        }
        printf("\n");
    }
    return 0;
```

Output

```
/tmp/iXBERhr3cF.o
Enter a number: 11
           11

          9 9 9

        7 7 7 7 7

      5 5 5 5 5 5 5

    3 3 3 3 3 3 3 3 3

  1 1 1 1 1 1 1 1 1 1 1


=== Code Execution Successful ===
```

Q6)

main.c

Share Run

Output

```
int main() {
    int matrix[3][3] = {{7, 8, 9}, {4, 5, 6}, {1, 2, 3}};
    for (int i=0; i<3; i++) {
        int minimum = matrix[i][0];
        int iofmin = i, jofmin = 0;
        for (int j=1; j<3; j++) {
            if (matrix[i][j] < minimum) {
                minimum = matrix[i][j];
                jofmin = j;
                iofmin = i;
            }
        }
        int saddle = 0, maximum = minimum;
        for (int k=0; k<3; k++) {
            if (k!=iofmin && maximum > matrix[k][jofmin]) {
                saddle++;
            }
        }
        if (saddle==2) {
            printf("\n%d is the saddle point found at (%d, %d)"
                , minimum, jofmin, iofmin);
        } else {
            printf("\nNo saddle point found in row %d", i+1);
        }
    }
```

```
/tmp/Ow8xEEgi2T.o

7 is the saddle point found at (0, 0)
No saddle point found in row 2
No saddle point found in row 3

=== Code Execution Successful ===
```

Online C Compiler - Programiz - Google Chrome

Q7)

main.c

Share Run

```c
int main() {
    int matrix1[3][3] = {   {1, 2, 3},
                            {4, 5, 6},
                            {7, 8, 9}   };

    int matrix2[3][3] = {   {10, 11, 12},
                            {13, 14, 15},
                            {16, 17, 18}    };

    int resultmatrix[3][3] = {0};
    int sum;

    for (int i=0; i<3; i++) {
        sum = 0;
        for (int j=0; j<3; j++) { // 1st row 1st column
            int product = matrix1[i][j] * matrix2[j][0];
            sum += product;
            if (j==2) {
```

Output

```
/tmp/aAN4TiFAZO.o
[84, 90, 96]
[201, 216, 231]
[318, 342, 366]


=== Code Execution Successful ===
```

```
21              resultmatrix[i][0] = sum;
22              sum = 0;
23          }
24      }
25      for (int j=0; j<3; j++) { // 1st row 2nd column
26          int product = matrix1[i][j] * matrix2[j][1];
27          sum += product;
28          if (j==2) {
29              resultmatrix[i][1] = sum;
30              sum = 0;
31          }
32      }
33      for (int j=0; j<3; j++) { // 1st row 3rd column
34          int product = matrix1[i][j] * matrix2[j][2];
35          sum += product;
36          if (j==2) {
37              resultmatrix[i][2] = sum;
38              sum = 0;
39          }
40      }
41      printf("[%d, %d, %d]\n", resultmatrix[i][0],
            resultmatrix[i][1], resultmatrix[i][2]);
42  }
43
44  return 0;
```

Q8)

main.c

Share Run

```c
int main() {
    int rows;

    printf("Enter the number of rows for upper half: ");
    scanf("%d", &rows);

    for (int i=1; i <= rows; i++) {
        for (int j=i; j < rows; j++) {
            printf(" ");
        }
        for (int j=1; j <= (2*i-1); j++) {
            printf("*");
        }
        printf("\n");
    }

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

    return 0;
```

Output

```
/tmp/7F6Q2hDvbc.o
Enter the number of rows for upper half: 4
   *
  ***
 *****
*******
 *****
  ***
   *


=== Code Execution Successful ===
```