KIDUS ABEBE MEKONEN
Roll No- 2106285
Section A11
IT department

23 April Lab questions

#1. WAP to find out the transpose of a given matrix.

Code:

```c
#include <stdio.h>
int main()
{
    int i_285,j_285,m_285,n_285;
    int A_285[10][10];
    printf("State the order of your matrix\n");
    scanf("%d%d",&m_285,&n_285);
    printf("Please provide the elements of your matrix correspondingly\n");
    for(i_285=0;i_285<m_285;i_285++)
    {
        for(j_285=0;j_285<n_285;j_285++)
        {
            printf("A[%d][%d]=",i_285+1,j_285+1);
            scanf("%d",&A_285[i_285][j_285]);
        }
    }
    printf("The matrix is as follows\n");
    for(i_285=0;i_285<m_285;i_285++)
    {
        for(j_285=0;j_285<n_285;j_285++)
        {
            printf("%d\t",A_285[i_285][j_285]);
            if(j_285==n_285-1)
            printf("\n");
        }
    }
    printf("The transpose of the matrix is\n");
    for(j_285=0;j_285<n_285;j_285++)
    {
        for(i_285=0;i_285<m_285;i_285++)
        {
            printf("%d\t",A_285[i_285][j_285]);
            if(i_285==(m_285-1))
            printf("\n");
        }
    }
    return 0;
}
```

Output:

KIDUS ABEBE MEKONEN
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```
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> gcc Matrix_transpose.c
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> ./a.exe
State the order of your matrix
2 3
Please provide the elements of your matrix correspondingly
A[1][1]=1
A[1][2]=23
A[1][3]=3
A[2][1]=4
A[2][2]=5
A[2][3]=6
The matrix is as follows
1       23      3
4       5       6
The transpose of the matrix is
1       4
23      5
3       6
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays>
```

```
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> ./a.exe
State the order of your matrix
3 2
Please provide the elements of your matrix correspondingly
A[1][1]=34
A[1][2]=34
A[2][1]=
56
A[2][2]=76
A[3][1]=67
A[3][2]=32
The matrix is as follows
34      34
56      76
67      32
The transpose of the matrix is
34      56      67
34      76      32
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays>
```

#2. Take input of value of a 2 D array (using scanf) and print the 2 D array (as a matrix).

Code:

```c
#include <stdio.h>
int main()
{
    int i_285,j_285,m_285,n_285;
    int A_285[10][10];
    printf("Give the order of your matrix\n");
    scanf("%d%d",&m_285,&n_285);
    for(i_285=0;i_285<m_285;i_285++)
    {
        for(j_285=0;j_285<n_285;j_285++)
        {
            printf("A[%d][%d]=",i_285+1,j_285+1);
            scanf("%d",&A_285[i_285][j_285]);
        }
    }
    printf("Your 2D array is as follows\n");
    for(i_285=0;i_285<m_285;i_285++)
    {
```

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```
        for(j_285=0;j_285<n_285;j_285++)
        {
            printf("%d\t",A_285[i_285][j_285]);
            if(j_285==n_285-1)
            printf("\n");
        }
    }
    return 0;
}
```

Output:

```
PROBLEMS  OUTPUT  TERMINAL
TERMINAL
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> gcc 2Darray.c
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> ./a.exe
Give the order of your matrix
2 3
A[1][1]=1
A[1][2]=23
A[1][3]=
54
A[2][1]=7
A[2][2]=57
A[2][3]=7
Your 2D array is as follows
1       23      54
7       57      7
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays>
```

```
PROBLEMS  OUTPUT  TERMINAL
TERMINAL
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> ./a.exe
Give the order of your matrix
2 2
A[1][1]=32
A[1][2]=34
A[2][1]=45
A[2][2]=56
Your 2D array is as follows
32      34
45      56
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays>
```

#3. WAP to find out the sum of the elements stored in a matrix.
Code:

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```c
#include <stdio.h>
int main()
{
    int i_285,j_285,m_285,n_285,sum_285;
    int A_285[10][10];
    printf("Provide the order of the matrix\n");
    scanf("%d%d",&m_285,&n_285);
    printf("provide the elements of your matrix\n");
    for(i_285=0;i_285<m_285;i_285++)
    {
        for(j_285=0;j_285<n_285;j_285++)
        {
            printf("A[%d][%d]=",i_285+1,j_285+1);
            scanf("%d",&A_285[i_285][j_285]);
        }
    }
    printf("Your 2D array is as follows\n");
    for(i_285=0;i_285<m_285;i_285++)
    {
        for(j_285=0;j_285<n_285;j_285++)
        {
            printf("%d\t",A_285[i_285][j_285]);
            if(j_285==n_285-1)
            printf("\n");
        }
    }
    for(i_285=0;i_285<m_285;i_285++)
    {
        for(j_285=0;j_285<n_285;j_285++)
        {
            sum_285= sum_285+A_285[i_285][j_285];
        }
    }
    printf("The sum of your elements is=> %d",sum_285);
    return 0;
}
```

Output:

```
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> gcc matrix_sum.c
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> ./a.exe
Provide the order of the matrix
2 3
provide the elements of your matrix
A[1][1]=12
A[1][2]=233
A[1][3]=45
A[2][1]=5
A[2][2]=76
A[2][3]=87
Your 2D array is as follows
12      233     45
5       76      87
The sum of your elements is=> 458
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays>
```

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```
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> ./a.exe
Provide the order of the matrix
3
3
provide the elements of your matrix
A[1][1]=34
A[1][2]=45
A[1][3]=65
A[2][1]=76
A[2][2]=8
A[2][3]=9
A[3][1]=54
A[3][2]=34
A[3][3]=6
Your 2D array is as follows
34      45      65
76      8       9
54      34      6
The sum of your elements is=> 331
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays>
```

#4. WAP to find out the sum of the diagonal elements of a matrix.

Code:

```c
#include <stdio.h>
int main()
{
    int i_285,j_285,m_285,n_285,sum_285;
    int A_285[10][10];
    printf("Provide the order of the your square matrix\n");
    scanf("%d%d",&m_285,&n_285);
    printf("provide the elements of your matrix\n");
    for(i_285=0;i_285<m_285;i_285++)
    {
        for(j_285=0;j_285<n_285;j_285++)
        {
            printf("A[%d][%d]=",i_285+1,j_285+1);
            scanf("%d",&A_285[i_285][j_285]);
        }
    }
    printf("Your 2D array is as follows\n");
    for(i_285=0;i_285<m_285;i_285++)
    {
        for(j_285=0;j_285<n_285;j_285++)
        {
            printf("%d\t",A_285[i_285][j_285]);
            if(j_285==n_285-1)
            printf("\n");
        }
    }
    for(i_285=0;i_285<m_285;i_285++)
    {
        for(j_285=0;j_285<n_285;j_285++)
        {
            if(i_285==j_285)
            {
                sum_285=sum_285+A_285[i_285][j_285];
```

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```
            }
        }
    }
    printf(" sum of your array is %d",sum_285);
}
```

Output:

```
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> gcc diagonal_sum.c
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays> ./a.exe
Provide the order of the your square matrix
4 4
provide the elements of your matrix
A[1][1]=1
A[1][2]=23
A[1][3]=34
A[1][4]=34
A[2][1]=34
A[2][2]=1
A[2][3]=43
A[2][4]=34
A[3][1]=45
A[3][2]=45
A[3][3]=1
A[3][4]=43
A[4][1]=3
A[4][2]=35
A[4][3]=35
A[4][4]=1
Your 2D array is as follows
1       23      34      34
34      1       43      34
45      45      1       43
3       35      35      1
 sum of your array is 4
PS C:\Users\KIIT\Desktop\Programming\23_april_2D Arrays>
```