

Q)Write a C program to do the following by passing matrix as parameter:

- 1) Matrix addition and subtraction.
- 2) Matrix multiplication.
- 3) Sum of principle and non principle diagonal of matrix.
- 4) Sum of rows and columns.
- 5) Print the transpose
- 6) Check if a given matrix is symmetric or not.

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- Q1. Write a C/C++ program to do the following
- pass the matrices as parameters in all these programs.
- (1) Matrix addition, subtraction
  - (2) Matrix multiplication
  - (3) Sum of principle & non principle diagonal
  - (4) sum of rows & columns.
  - (5) Print the ~~the~~ transpose matrix
  - (6) Check if a given matrix is symmetric

// addition

```
void add(int n, int mat1[n][n], int mat2[n][n])  
{  
    int sum[n][n];  
    for(i=0; i<n; i++){  
        for(j=0; j<n; j++){  
            sum[i][j] = mat1[i][j] + mat2[i][j];  
        }  
    }  
    printmat(n, sum)  
}
```

```
void sub(int n, int mat1[n][n], int mat2[n][n])  
{  
    int sub[n][n];  
    for(i=0; i<n; i++){  
        for(j=0; j<n; j++){  
            sub[i][j] = mat1[i][j] - mat2[i][j];  
        }  
    }  
    printmat(n, sub)  
}
```

```

multiply(int n, int mat1[n][n], int mat2[n][n])
{
    int prod[n][n];
    for(i=0; i<n; i++){
        for(j=0; j<n; j++){
            prod[i][j]=0;
            for(int k=0; k<n; k++){
                prod[i][j] += mat1[i][k] * mat2[k][j];
            }
        }
    }
    printmat(n, prod);
}

```

```

sop(int n, int mat1[n][n]) {
    * sump=0, sumnp=0, i, j, k;
    for(i=0; i<n; i++){
        for(j=0; j<n; j++){
            if(j==i){
                sump += mat1[i][j];
            }
        }
    }
}

```

```

for(i=0; i<n; i++){
    for(j=0; j<n; j++){
        if(j==i){
            sumnp += mat1[i][n-1-i];
        }
    }
}

```

```

printf("principle diagonal sum %.d\n",
       non principle diagonal sum %.d\n",
       sump, sumnp);
}

```



```
void sumrc(int n, int mat1[n][n]) {
    int sumr, sumc, i, j;
    int mat3[n+1][n+1];
    for (i = 0; i < n; i++) {
        sumr = 0;
        mat3[i][j] = mat1[i];
        for (j = 0; j < n; j++) {
            mat3[i][j] = mat1[i][j];
            sumr += mat1[i][j];
        }
        mat3[i][n] = sumr;
    }
    for (i = 0; i < n; i++) {
        sumc = 0;
        for (j = 0; j < n; j++) {
            sumc += mat1[j][i];
        }
        mat3[n][i] = sumc;
    }
    mat3[n][n] = 0;
    printmat(n+1, mat3);
}
```

```
void transpose(int n, int mat1[n][n])
{
    int transpose[n][n];
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            transpose[j][i] = mat1[i][j];
        }
    }
    printmat(n, transpose);
}
```

```
void sym (int n, int mat[n][n])
{
    int flag = 1;
    for (int i = 0; i < n; i++)
        for (int j = 0; j < n; j++) {
            if (mat[i][j] != mat[j][i])
            {
                flag = 0;
            }
        }
    if (flag == 0) printf("not symmetric\n");
    else printf("symmetric");
}
```

```
void printMatrix (int n, int mat[n][n])
{
    int i, j;
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            printf("%d ", mat[i][j]);
        }
        printf("\n");
    }
}
```

Enter values of  $n$  for  $n \times n$  matrix:

2

Enter the values of matrix 1

1

2

2

1

Enter the values of matrix 2

1

2

3

4

Menu

1. Addition

2. Subtraction

3. Multiplication

4. Sum of principle and non principle diagonals

5. Sum of rows & columns

6. Transpose matrix

7. Check if matrix is symmetric

8. Exit

Enter your choice

1

2 4

5 5

Enter your choice

-2

0 0

-1 -3



Enter your choice

3

7 10

5 8

Sum

Enter your choice

4

Sum of principle diagonal is 2

Sum of non principle diagonal is 4

Enter your choice

5

1 2 3

2 1 3

3 3 0

Enter your choice

6

1 2

2 1

Enter your choice

7

Symmetric

14/6/22

Output:

```
"C:\Users\Admin\Desktop\1BI" X + v
Enter the values of n for nxn and matrix
2
Enter the values for matrix 1
1
2
2
1
Enter the values for matrix 2
1
2
3
4

Menu
1.Addition
2.Subtraction
3.Multiplication
4.Sum of principle and non principle diagonals
5.Sum of rows and columns
6.Transpose matrix
7.Check if the matrix is symmetric
8.Exit

Enter your choice
1
2 4
5 5
Enter your choice
2
0 0
-1 -3
Enter your choice
3
7 10
5 8
Enter your choice
4
sum of principle diagonal is 2
sum of non principle diagonal is 4
Enter your choice
5
1 2 3
2 1 3
3 3 0
Enter your choice
6
1 2
2 1
Enter your choice
7
Symmetric
```