Write a C program for the following

Pass matrices as parameters

- 1. Matrix addition and subtraction
- 2. Multiplication
- 3. Sum of Rows and Columns
- 4. Sum of principle diagonal and non principle diagonal
- 5. Print transpose of given matrix
- 6. Check if matrix is symmetric or not

Code:

```
#include<stdio.h>
#include<conio.h>
void add(int matrix1[3][3], int matrix2[3][3])
{
   int sum[3][3];
   for(int i=0;i<3;i++)
     for(int j=0; j<3; j++)
         sum[i][j]=matrix1[i][j]+matrix2[i][j];
   for(int i=0; i<3; i++){
     printf("\n");
     for(int j=0; j<3; j++){
        printf("\t%d",sum[i][j])
}
void subtract(int matrix1[3][3], int matrix2[3][3])
   int diff[3][3];
   for(int i=0;i<3;i++)
     for(int j=0; j<3; j++)
         diff[i][j]=matrix1[i][j]-matrix2[i][j];
   for(int i=0; i<3; i++){
      printf("\n");
     for(int j=0; j<3; j++){
        printf("\t%d",diff[i][j]);
}
}
void multiply(int matrix1[3][3], int matrix2[3][3])
{
   int product[3][3];
```

```
for(int i=0;i<3;i++){}
     for(int j=0; j<3; j++){
        product[i][j]=0;
           for(int k=0; k<3; k++){
             product[i][j]+=matrix1[i][k]*matrix2[k][j];
        }
     }
   for(int i=0; i<3; i++){
     printf("\n");
     for(int j=0; j<3; j++){
        printf("\t%d",product[i][j]);
}
}
void sumOfRowsColumns(int matrix[3][3])
  int row_sum[3][4],column_sum[3][4],rowsum,columnsum;
  for(int i=0; i<3; i++){
     rowsum=0,columnsum=0;
     for(int j=0; j<3; j++){
        rowsum+=matrix[i][j];
        columnsum+=matrix[j][i];
     row_sum[i][4]=rowsum;
     column_sum[i][4]=columnsum;
  for(int i=0;i<3;i++){
     printf("\n");
     for(int j=0; j<4; j++){
        printf("\t%d",row_sum[i][j]);
        }
  for(int i=0; i<3; i++){
     printf("\n");
     for(int j=0; j<4; j++){
        printf("\t%d",column_sum[i][j]);
}
```

```
}
void transpose(int matrix[3][3])
  int transpose[3][3];
  for(int i=0; i<3; i++){
     for(int j=0; j<3; j++){
        transpose[i][j]=matrix[j][i];
     }
  for(int i=0; i<3; i++){
     printf("\n");
     for(int j=0; j<3; j++){
        printf("\t%d",transpose[i][j]);
}
}
void checkSymmetric(int matrix[3][3])
   for(int i=0;i<3;i++){
     for(int j=0; j<3; j++){
        if(matrix[i][j]!=matrix[j][i]){
           printf("\nAsymmetric matrix");
           return;
        }
     }
  printf("\nMatrix is symmetric");
}
void sumOfDiagonals(int matrix[3][3])
  int sum=0,a=0;
   for (int i=0; i<3; ++i) {
        sum = sum + matrix[i][i];
        a = a + matrix[i][3 - i - 1];
     printf("\nMain diagonal elements sum is = %d\n", sum);
     printf("Off-diagonal elements sum is = %d\n", a);
  }
```

Output:

```
Enter your choice: 3
Enter the number of rows and columns of matrix1: 2 2
Enter the number of columns of matrix2: 2 2
Enter elements of matrix1:
Enter elements of matrix2:
76
Resultant matrix after multiplication:
396
512
            685
Matrix Operations:
1. Addition
Subtraction
3. Multiplication
4. Sum of Diagonals
5. Sum of Rows and Columns
 5. Transpose
7. Check Symmetry
0. Exit
Enter your choice: 4
Enter the number of rows and columns of the matrix: 2 2
Enter elements of the matrix:
 54
Sum of principal diagonal: 55
Sum of non-principal diagonal: 76
Matrix Operations:
1. Addition
 2. Subtraction
 3. Multiplication
4. Sum of Diagonals
5. Sum of Rows and Columns
 5. Transpose

    Check Symmetry
    Exit

Enter your choice: 5
Enter the number of rows and columns of the matrix: 2 2
Enter elements of the matrix:
78
90
Sum of elements in Row 1: 168
Sum of elements in Row 2: 0
Sum of elements in Column 1: 78
Sum of elements in Column 2: 90
```

```
Matrix Operations:
1. Addition
2. Subtraction
2. Suptraction
3. Multiplication
4. Sum of Diagonals
5. Sum of Rows and Columns
TransposeCheck Symmetry
0. Exit
Enter your choice: 1
Enter the number of rows and columns of the matrices: 2 2
Enter elements of matrix1:
Enter elements of matrix2:
12
78
55
23
Resultant matrix after addition:
16 85
63
             26
Matrix Operations:
1. Addition
2. Subtraction
3. Multiplication
4. Sum of Diagonals
5. Sum of Rows and Columns
6. Transpose
7. Check Symmetry
0. Exit
Enter your choice: 2
Enter the number of rows and columns of the matrices: 2 2
Enter elements of matrix1:
34
78
99
24
Enter elements of matrix2:
65
55
88
11
Resultant matrix after subtraction:
```

```
Enter your choice: 6
Enter the number of rows and columns of the matrix: 2 2
Enter elements of the matrix:
56
Transpose of the matrix:
        56
43
Matrix Operations:
1. Addition
2. Subtraction
Multiplication
4. Sum of Diagonals
5. Sum of Rows and Columns
6. Transpose
7. Check Symmetry
0. Exit
Enter your choice: 7
Enter the number of rows and columns of the matrix: 2 2
Enter elements of the matrix:
87
The matrix is not symmetric.
```

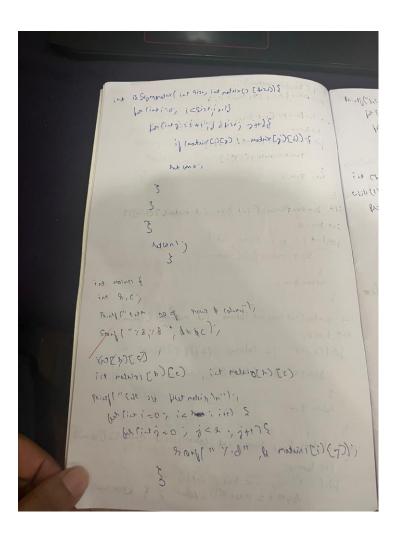
Observation:

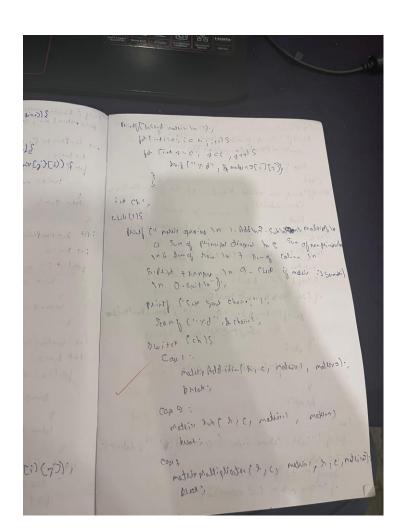
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Remarks

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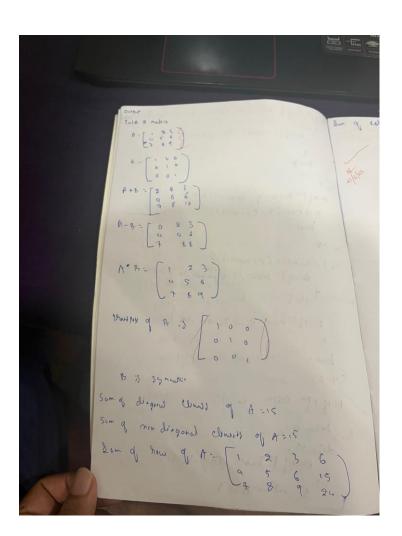




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