Week 1

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Q. Write a program in C on matrices using functions

INPUT :

```
#include <stdio.h>
#include <stdlib.h>

int A[3][3];
int B[3][3];
int C[3][3];

void add(int a[3][3], int b[3][3])
{
   for (int i = 0; i < 3; i++)
   {
      for (int j = 0; j < 3; j++)
      {
         C[i][j] = a[i][j] + b[i][j];
      }
   }
   printf("result\n");
   for (int i = 0; i < 3; i++)
   {
      for (int j = 0; j < 3; j++)
      {
         printf("%d ", C[i][j]);
      }
      printf("\n");
   }
}
```

```
void sub(int a[3][3], int b[3][3])
{
   for (int i = 0; i < 3; i++)
   {
      for (int j = 0; j < 3; j++)
      {
         C[i][j] = a[i][j] - b[i][j];
      }
   }
   printf("result\n");
   for (int i = 0; i < 3; i++)
   {
      for (int j = 0; j < 3; j++)
      {
         printf("%d ", C[i][j]);
      }
      printf("\n");
   }
}
void Mult(int a[3][3], int b[3][3])
{
   for (int i = 0; i < 3; i++)
   {
      for (int j = 0; j < 3; j++)
      {
         C[i][j] = 0;
         for (int k = 0; k < 3; k++)
         {
            C[i][j] += a[i][k] * b[k][j];
         }
      }
   }
```

```
    printf("result\n");
    for (int i = 0; i < 3; i++)
    {
        for (int j = 0; j < 3; j++)
        {
            printf("%d ", C[i][j]);
        }
        printf("\n");
    }
}
void transpose(int a[3][3])
{
    for (int i = 0; i < 3; i++)
    {
        for (int j = 0; j < 3; j++)
        {
            C[i][j] = a[j][i];
        }
    }
    printf("result\n");
    for (int i = 0; i < 3; i++)
    {
        for (int j = 0; j < 3; j++)
        {
            printf("%d ", C[i][j]);
        }
        printf("\n");
    }
}

int main()
{
```

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

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



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

printf("Print the elements for matrix B:\n");
```

```
for (int i = 0; i < 3; i++)
{
   for (int j = 0; j < 3; j++)
   {
      printf("%d ", B[i][j]);
   }
   printf("\n");
}

int ch=0;

while(ch!=5){
   printf("1.ADD\n2.SUB\n3.MULT\n4.TRANSPOSE\n5.EXIT\n");
   scanf("%d",&ch);
   switch(ch){
      case 1:
         add(A,B);
         break;
      case 2:
         sub(A,B);
         break;
      case 3:
         Mult(A,B);
         break;
      case 4:
         printf("Transpose matrix (A->0/B->1)\n");
         int choice;
         scanf("%d",&choice);
         if(choice==0){
            transpose(A);
         }
         else{
```

```
                transpose(B);
            }
            break;
        case 5:
            exit(0);
            break;
        default:
            printf("Invalid choice\n");
            break;
    }
  }
}
```

Output :

```
Enter the elements for matrix A:
1 3 5
2 3 5
1 4 7
Enter the elements for matrix B:
2 4 6
3 6 8
1 2 3
Print the elements for matrix A:
1 3 5
2 3 5
1 4 7
Print the elements for matrix B:
2 4 6
3 6 8
1 2 3
1.ADD
2.SUB
3.MULT
4.TRANSPOSE
5.EXIT
1
Addition result
3 7 11
5 9 13
2 6 10
1.ADD
2.SUB
3.MULT
4.TRANSPOSE
5.EXIT
2
Subtraction result
-1 -1 -1
-1 -3 -3
0 2 4
1.ADD
2.SUB
3.MULT
4.TRANSPOSE
5.EXIT
```

```
3
Multiplication result
16 32 45
18 36 51
21 42 59
1.ADD
2.SUB
3.MULT
4.TRANSPOSE
5.EXIT
4
Transpose matrix (A->0/B->1)
0
Transpose result
1 2 1
3 3 4
5 5 7
1.ADD
2.SUB
3.MULT
4.TRANSPOSE
5.EXIT
4
Transpose matrix (A->0/B->1)
1
Transpose result
2 3 1
4 6 2
6 8 3
1.ADD
2.SUB
3.MULT
4.TRANSPOSE
5.EXIT
5
```