

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

void subtract(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("Resultant matrix\n");
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            printf("%d\t",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("\n");
    }
    printf("Resultant matrix\n");
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            printf("%d\t",C[i][j]);
        }
        printf("\n");
    }
}
void multiply(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("Resultant matrix\n");
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            printf("%d\t",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("matrix A\n");
for(int i=0;i<3;i++){
    for(int j=0;j<3;j++){
        printf("%d\t",A[i][j]);
    }
    printf("\n");
}
printf("matrix B\n");
for(int i=0;i<3;i++){
    for(int j=0;j<3;j++){
        printf("%d\t",B[i][j]);
    }
    printf("\n");
}
int ch=0;
while(ch!=5){
    printf("1.add\n2.subtract\n3.transpose\n4.multiply\n5.exit\n");
    scanf("%d",&ch);
    switch(ch){
        case 1:
            add(A,B);
            break;
        case 2:
            subtract(A,B);
            break;

```

```

case 3:
    printf("enter matrix to transpose(A->1/B->2)\n");
    int c1;
    scanf("%d",&c1);
    if(c1==1){
        transpose(A);
        break;
    }
    else{
        transpose(B);
        break;
    }
    break;
case 4:
    multiply(A,B);
    break;
case 5:
    exit(0);
    break;
default:
    printf("wrong choice entered\n");
    break;
}
}
}

```

Output :

```
enter the elements for matrix A
1 2 3
4 5 6
7 8 9
enter the elements for matrix B
9 8 7
6 5 4
3 2 1
matrix A
1      2      3
4      5      6
7      8      9
matrix B
9      8      7
6      5      4
3      2      1
1.add
2.subtract
3.transpose
4.multiply
5.exit
1
Resultant matrix
10      10      10
10      10      10
10      10      10
1.add
2.subtract
3.transpose
4.multiply
5.exit
2
Resultant matrix
-8      -6      -4
-2      0      2
4      6      8
1.add
2.subtract
3.transpose
4.multiply
5.exit
4
Resultant matrix
30      24      18
84      69      54
138     114     90
```

```
1.add
2.subtract
3.transpose
4.multiply
5.exit
3
enter matrix to transpose(A->1/B->2)
1
```

Resultant matrix

1	4	7
2	5	8
3	6	9

```
1.add
2.subtract
3.transpose
4.multiply
5.exit
3
enter matrix to transpose(A->1/B->2)
2
```

Resultant matrix

9	6	3
8	5	2
7	4	1