WEEK-1

Q.Write a c program on matrices using functions.

```
#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;
printf("1.add\t2.subtract\t3.transpose\t4.multiply\t5.exit\n");
scanf("%d",&ch);
while(ch!=5){
    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;
    }
    printf("1.add\t2.subtract\t3.transpose\t4.multiply\t5.exit\n");
    printf("Enter your choice\n");
    scanf("%d",&ch);
  }
}
```

Output:

```
enter the elements for matrix A
1
2
3
4
5
6
7
8
9
enter the elements for matrix B
1 3 5 7 9 2 4 6 8
matrix A
1       2       3
4       5       6
7       8       9
matrix B
1       3       5
7       9       2
4       6       8
1.add   2.subtract      3.transpose     4.multiply      5.exit
1
Resultant matrix
2       5       8
11      14      8
11      14      17
1.add   2.subtract      3.transpose     4.multiply      5.exit
Enter your choice
```

```
1.add   2.subtract      3.transpose     4.multiply      5.exit
Enter your choice
2
Resultant matrix
0       -1      -2
-3      -4      4
3       2       1
1.add   2.subtract      3.transpose     4.multiply      5.exit
Enter your choice
```

```
4
Resultant matrix
27      39      33
63      93      78
99      147     123
1.add   2.subtract      3.transpose     4.multiply      5.exit
Enter your choice
```

```
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
Enter your choice
```