Week 1

-YASH GUPTA(1BM21CS251)
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Q. Write a program in C on matrices using functions

INPUT :

```c
#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]);
        }
```

```c
            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(){
```

```c
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;
```

```c
        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
```