



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution

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NAAC – UGC with ‘A+’ Grade

Approved by AICTE, New Delhi & Affiliated to

Anna University, Chennai

**DEPARTMENT OF INFORMATION
TECHNOLOGY**

PROGRAMMING FOR PROBLEM SOLVING

I YEAR

UNIT 3 – ARRAYS AND STRINGS

Matrix operations

MATRIX OPERATIONS

The matrix operations help us to combine two or more matrices, to form a single matrix. The arithmetic operations of addition, subtraction, multiplication can also be performed on matrices

The following are some of the important matrix operations.

- Addition - matrix operations
- Subtraction - matrix operations
- Multiplication - matrix operations

1.Addition - matrix operations

```
#include<stdio.h>
int main()
{
int a[10][10],b[10][10],add[10][10],r,c,i,j,k;
system("cls");
printf("enter the number of row=");
scanf("%d",&r);
printf("enter the number of column=");
scanf("%d",&c);
printf("enter the first matrix element=\n");
for(i=0;i<r;i++)
```

```
{
for(j=0;j<c;j++)
{
scanf("%d",&a[i][j]);
}
}
printf("enter the second matrix element=\n");
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
scanf("%d",&b[i][j]);
}
}
printf("addition of the matrix=\n");
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
add[i][j]=0;
for(k=0;k<c;k++)
{
add[i][j]+=a[i][k]*b[k][j];
}
}
}
//for printing result
```

```
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
printf("%d\t",add[i][j]);
}
printf("\n");
}
return 0;
}
```

Output

```
enter the number of row= 2
enter the number of column= 2
enter the first matrix element=
1
1
1
1
enter the second matrix element= 2
1
1
1
1
addition of the matrix=
4    4
4    4
```

2. Subtraction - matrix operations

```
#include<stdio.h>
int main()
{
int a[10][10],b[10][10],sub[10][10],r,c,i,j,k;
system("cls");
printf("enter the number of row=");
scanf("%d",&r);
printf("enter the number of column=");
scanf("%d",&c);
printf("enter the first matrix element=\n");
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
scanf("%d",&a[i][j]);
}
}
printf("enter the second matrix element=\n");
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
scanf("%d",&b[i][j]);
}
}
```

```
}
```

```
printf("subraction of the matrix=\n");
```

```
for(i=0;i<r;i++)
```

```
{
```

```
for(j=0;j<c;j++)
```

```
{
```

```
sub[i][j]=0;
```

```
for(k=0;k<c;k++)
```

```
{
```

```
sub[i][j]+=a[i][k]*b[k][j];
```

```
}
```

```
}
```

```
}
```

```
//for printing result
```

```
for(i=0;i<r;i++)
```

```
{
```

```
for(j=0;j<c;j++)
```

```
{
```

```
printf("%d\t",sub[i][j]);
```

```
}
```

```
printf("\n");
```

```
}
```

```
return 0;
```

```
}
```

Output

enter the number of row= 2

enter the number of column= 2

enter the first matrix element=

1

1

1

1

enter the second matrix element= 2

1

1

1

1

Subtraction of the matrix=

4 4

4 4

3. Multiplication - matrix operations

```
#include <stdio.h>
int main()
{
int a[10][10],b[10][10],mul[10][10],r,c,i,j,k;
printf("enter the number of row=");
scanf("%d",&r);
printf("enter the number of column=");
scanf("%d",&c);
printf("enter the first matrix element=\n");
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
scanf("%d",&a[i][j]);
}
}
printf("enter the second matrix element=\n");
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
scanf("%d",&b[i][j]);
}
}
```



```
printf("multiply of the matrix=\n");
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
mul[i][j]=0;
for(k=0;k<c;k++)
{
mul[i][j] += a[i][k]*b[k][j];
}
}
}
//for printing result
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
printf("%d\t",mul[i][j]);
}
printf("\n");
}
return 0;
}
```

Output

enter the number of row= 2

enter the number of column= 2

enter the first matrix element=

1

1

1

1

enter the second matrix element= 2

1

1

1

1

multiply of the matrix=

2 2

2 2

Thank you