

Points to remember for matrix multiplication

- In matrix multiplication *first matrix one row element is multiplied by second matrix all column elements.*
- To multiply two matrices, **the number of columns of the first matrix should be equal to the number of rows of the second matrix.**
- And the result will have the same number of **rows as the 1st matrix**, and the same number of **columns as the 2nd matrix.**

Matrix Multiplication of 3 x 3 Matrix

Matrix X[3][3]

1	2	3
4	5	6
7	8	9

Matrix Y[3][3]

1	4	7
2	5	8
3	6	9

X

=

Process of Matrix Multiplication

$1*1+2*2+3*3$	$1*4+2*5+3*6$	$1*7+2*8+3*9$
$4*1+5*2+6*3$	$4*4+5*5+6*6$	$4*7+5*8+6*9$
$7*1+8*2+9*3$	$7*4+8*5+9*6$	$7*7+8*8+9*9$

Matrix Z[3][3]

Final Result is

14	32	50
32	77	122
50	122	194

Example : Write a C program to perform multiplication of any two [3 x 3] matrix.

```
#include<stdio.h>
#include<conio.h>
void main( )
{
    int x[3][3],y[3][3],z[3][3],i,j,k,sum;
    clrscr( ) ;
    printf("\nEnter values for first 3 x 3 matrix:\n");
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
            scanf("%d",&x[i][j]);
    }
    printf("\nEnter values for second 3 x 3 matrix:\n");
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
            scanf("%d",&y[i][j]);
    }
    printf("\n The first 3 x 3 matrix entered by you is:\n");
    for(i=0;i<3;i++)
    {
```

```

    for(j=0;j<3;j++)
        printf("\t%d",x[i][j]);
        printf("\n");
    }
    printf("\n the second 3 x 3 matrix entered :\n");
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
            printf("\t%d",y[i][j]);
            printf("\n");
        }
        for(i=0;i<3;i++)
        {
            for(j=0;j<3;j++)
            {
                sum=0;
                for(k=0;k<3;k++)
                    sum=sum+x[i][k]*y[k][j];
                z[i][j]=sum;
            }
        }
        printf("\nThe product of the above two matrices is:\n");
        for(i=0;i<3;i++)
        {
            for(j=0;j<3;j++)
                printf("\t%d",z[i][j]);
                printf("\n");
            }
            printf("\n Press any key to exit.");
            getch();
        }
    }

```

Output :

```

The first 3 x 3 matrix entered by you is:
    1    2    3
    4    5    6
    7    8    9

the second 3 x 3 matrix entered :
    1    4    7
    2    5    8
    3    6    9

The product of the above two matrices is:
    14    32    50
    32    77    122
    50    122    194

Press any key to exit.

```