

Programming in C (Matrix multiplication)

Prepared By

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Matrix Multiplication

Two matrices with a given order can be multiplied only when number of columns of first matrix is equal to the number of rows of the second matrix.

```
#include<stdio.h>

int main()
{
    printf("\n\n\t To calculate matrix Multiplication\n\n");

    int n, m, c, d, p, q, k, a[10][10], b[10][10], c[10][10];

    printf("\nEnter the number of rows and columns of the first matrix: \n\n");
    scanf("%d%d", &p, &q);

    printf("\nEnter the elements of the first matrix: \n\n");
    for(i = 0; i < p; i++) // rows
    {
        for(j = 0; j < q; j++) //columns
        {
            scanf("%d", &a[i][j]);
        }
    }

    printf("\nEnter the number of rows and columns of the second matrix: \n\n");
    scanf("%d%d", &r, &s);

    if(q != r)
        printf("Matrices with the given order cannot be multiplied with each other.\n\n");
    else // matrices can be multiplied
    {
        printf("\nEnter the elements of the second matrix: \n\n");

        for(i = 0; i < r; i++) // rows
        {
            for(j = 0; j < s; j++) //columns
            {
                scanf("%d", &b[i][j]);
            }
        }
    }
}
```

```

    }
}
// printing the first matrix
printf("\n\nThe values the first matrix are: \n\n");
for(i = 0; i < p; i++)
{
    for(j = 0; j < q; j++)
    {
        printf("%d", a[i][j]);
    }
    printf("\n");
}

// printing the second matrix
printf("\n\nThe second matrix is: \n\n");
for(i = 0; i < r; i++)
{
    for(j = 0; j < s; j++)
    {
        printf("%d", b[i][j]);
    }
    printf("\n");
}

printf("\n\n\t Calculate the product of the matrices \n\n")
for(i = 0; i < p; i++)
{
    for(j= 0; j < s; j++)
    {
        c[i][j]=0;
        for(k = 0; k < r; k++)
        {
            c[i][j] = c[i][j] + a[i][k]*b[k][j];
        }
    }
}

// Displaying the elements of the product matrix
printf("\n\nThe multiplication of the two matrices is: \n\n");
for(i = 0; i < p; i++)
{
    for(j= 0; j< s; j++)
    {
        printf("%d\t", c[i][j]);
    }
}

```

```
        printf("\n");
    }
}
return 0;
}
```