

Multiplication of matrices with dynamic allocation

Program:

```
#include<stdio.h>

#include<stdlib.h>

int main()
{
    //getting number of rows and columns
    int i,j,row,col;

    printf("Enter number of rows in a matrix:");
    scanf("%d",&row);
    printf("Enter number of columns:");
    scanf("%d",&col);

    //dynamic allocation of 2d arrays
    int **a=(int**)malloc(row*sizeof(int*));
    for(i=0;i<row;i++)
    {
        a[i]=(int*)malloc(col*sizeof(int));
    }
    int **b=(int**)malloc(row*sizeof(int*));
    for(i=0;i<row;i++)
    {
        b[i]=(int*)malloc(col*sizeof(int));
    }

    //getting elements of matrix a
    printf("Enter the elements of matrix a:");
    for(i=0;i<row;i++)
    {
        for(j=0;j<col;j++)
```

```

    {
        scanf("%d",&a[i][j]);
    }
}

//getting elements of matrix b
printf("Enter the elements of matrix b:");
for(i=0;i<row;i++)
{
    for(j=0;j<col;j++)
    {
        scanf("%d",&b[i][j]);
    }
}

//multiplication of matrices
int multi[row][col];
int k;
for(i=0;i<row;i++)
{
    for(j=0;j<col;j++)
    {
        multi[i][j]=0;
        for(k=0;k<row;k++)
        {
            multi[i][j]=multi[i][j]+(a[i][k]*b[k][j]);
        }
    }
}

//printing the resultant matrix
printf("The matrix multiplication:\n");

```

```

for(i=0;i<row;i++)
{
    {
        for(j=0;j<col;j++)
        {
            printf("%d\t",multi[i][j]);
        }
        printf("\n");
    }
}

return 0;

```

The screenshot shows a web browser window with the URL `programiz.com/c-programming/online-compiler/`. The browser's address bar and tabs are visible at the top. Below the browser window is the online compiler interface, which has a dark theme. The interface is divided into two main sections: a code editor on the left and an output window on the right.

The code editor is titled "main.c" and contains the following C code:

```

4  {
5      //getting number of rows and columns
6      int i,j,row,col;
7      printf("Enter number of rows in a matrix:");
8      scanf("%d",&row);
9      printf("Enter number of columns:");
10     scanf("%d",&col);
11     //dynamic allocation of 2d arrays
12     int **a=(int**)malloc(row*sizeof(int*));
13     for(i=0;i<row;i++)
14     {
15         a[i]=(int*)malloc(col*sizeof(int));
16     }
17     int **b=(int**)malloc(row*sizeof(int*));
18     for(i=0;i<row;i++)
19     {
20         b[i]=(int*)malloc(col*sizeof(int));
21     }
22     //getting elements of matrix a
23     printf("Enter the elements of matrix a:");
24     for(i=0;i<row;i++)
25     {
26         for(j=0;j<col;j++)
27         {
28             scanf("%d",&a[i][j]);
29         }
30     }
31     //getting elements of matrix b

```

The output window on the right shows the execution results. It starts with a file path `/tmp/V0VGJ3T6pe.o`. The output text is as follows:

```

Enter number of rows in a matrix:3
Enter number of columns:3
Enter the elements of matrix a:1
2
3
4
5
6
7
8
9
Enter the elements of matrix b:1
3
4
5
6
7
8
9
The matrix multiplication:
30 36 42
66 81 96
102 126 150

```

At the bottom of the browser window, the Windows taskbar is visible, showing the search bar, task view button, and several application icons. The system tray on the right shows the date and time as 11:13 AM on 8/8/2023, along with weather information (33°C Mostly sunny) and language settings (ENG IN).