

1. Write a C program to perform Matrix Multiplication

```
#include <stdio.h>
```

```
// function to get matrix elements entered by the user
```

```
void getMatrixElements(int matrix[][10], int row, int column) {
```

```
    printf("\nEnter elements: \n");
```

```
    for (int i = 0; i < row; ++i) {
```

```
        for (int j = 0; j < column; ++j) {
```

```
            printf("Enter a%d%d: ", i + 1, j + 1);
```

```
            scanf("%d", &matrix[i][j]);
```

```
        }
```

```
    }
```

```
}
```

```
// function to multiply two matrices
```

```
void multiplyMatrices(int first[][10],
```

```
    int second[][10],
```

```
    int result[][10],
```

```
    int r1, int c1, int r2, int c2) {
```

```
    // Initializing elements of matrix mult to 0.
```

```
    for (int i = 0; i < r1; ++i) {
```

```
        for (int j = 0; j < c2; ++j) {
```

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

```
        }
```

```
    }
```

```
    // Multiplying first and second matrices and storing it in result
```

```
    for (int i = 0; i < r1; ++i) {
```

```

        for (int j = 0; j < c2; ++j) {
            for (int k = 0; k < c1; ++k) {
                result[i][j] += first[i][k] * second[k][j];
            }
        }
    }
}

```

// function to display the matrix

```
void display(int result[][10], int row, int column) {
```

```

    printf("\nOutput Matrix:\n");
    for (int i = 0; i < row; ++i) {
        for (int j = 0; j < column; ++j) {
            printf("%d ", result[i][j]);
            if (j == column - 1)
                printf("\n");
        }
    }
}

```

```
int main() {
```

```
    int first[10][10], second[10][10], result[10][10], r1, c1, r2, c2;
```

```
    printf("Enter rows and column for the first matrix: ");
```

```
    scanf("%d %d", &r1, &c1);
```

```
    printf("Enter rows and column for the second matrix: ");
```

```
    scanf("%d %d", &r2, &c2);
```

```
    // Taking input until
```

```
    // 1st matrix columns is not equal to 2nd matrix row
```

```
    while (c1 != r2) {
```

```

printf("Error! Enter rows and columns again.\n");

printf("Enter rows and columns for the first matrix: ");

scanf("%d%d", &r1, &c1);

printf("Enter rows and columns for the second matrix: ");

scanf("%d%d", &r2, &c2);

}

// get elements of the first matrix
getMatrixElements(first, r1, c1);

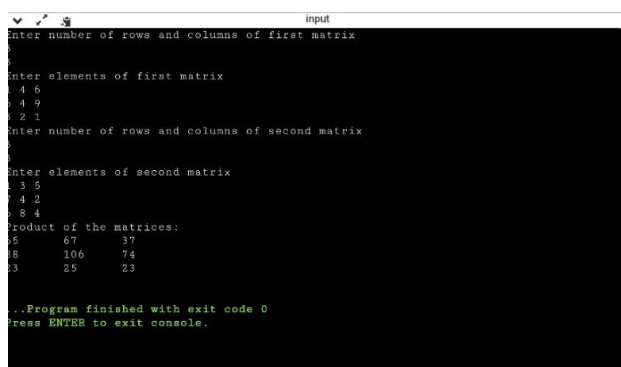
// get elements of the second matrix
getMatrixElements(second, r2, c2);

// multiply two matrices.
multiplyMatrices(first, second, result, r1, c1, r2, c2);

// display the result
display(result, r1, c2);

return 0;
}

```



The screenshot shows a terminal window titled 'input' with the following text:

```

Enter number of rows and columns of first matrix
Enter elements of first matrix
4 6
4 9
2 1
Enter number of rows and columns of second matrix
Enter elements of second matrix
3 5
4 2
8 4
Product of the matrices:
5    67    37
8    106   74
3     25    23
...Program finished with exit code 0
Press ENTER to exit console.

```