1. Write a C program to perform Matrix Multiplication

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#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;
}
```

```
Enter number of rows and columns of first matrix
3
3
Enter elements of first matrix
1 4 6
6 4 9
3 2 1
Enter number of rows and columns of second matrix
3
3
Enter elements of second matrix
1 3 5
7 4 2
6 8 4
Product of the matrices:
65      67      37
88      106     74
23      25      23


...Program finished with exit code 0
Press ENTER to exit console.
```