University of Kalyani

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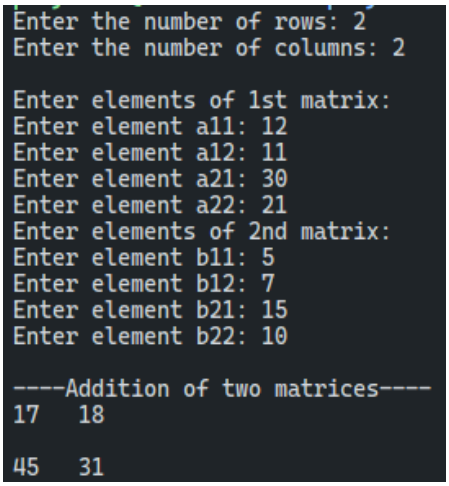
Q1. Write a Program to add matrix

Program Code:

```
#include <stdio.h>
int main() {
  int r, c, a[100][100], b[100][100], sum[100][100], i, j;
  printf("Enter the number of rows: ");
  scanf("%d", &r);
  printf("Enter the number of columns: ");
  scanf("%d", &c);
  printf("\nEnter elements of 1st matrix:\n");
  for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
      printf("Enter element a%d%d: ", i + 1, j + 1);
      scanf("%d", &a[i][j]);
    }
  printf("Enter elements of 2nd matrix:\n");
  for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
      printf("Enter element b%d%d: ", i + 1, j + 1);
      scanf("%d", &b[i][j]);
    }
  for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
      sum[i][j] = a[i][j] + b[i][j];
    }
  printf("\n----Addition of two matrices---- \n");
  for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
      printf("%d   ", sum[i][j]);
      if (j == c - 1) {
        printf("\n\n");
      }
    }
  return 0;
}
```

Output:



Q2. Write a Program to multiply two matrices

Program Code:

```
#include <stdio.h>
void getMatrixElements(int matrix[][10], int row, int column) {
  for (int i = 0; i < row; ++i) {
    for (int j = 0; j < column; ++j) {
      printf("Enter element %d%d: ", i + 1, j + 1);
      scanf("%d", &matrix[i][j]);
    }
  }
}
void multiplyMatrices(int first[][10],
                      int second[][10],
                      int result[][10],
                      int r1, int c1, int r2, int c2) {
  for (int i = 0; i < r1; ++i) {
    for (int j = 0; j < c2; ++j) {
      result[i][j] = 0;
    }
  }
  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];
      }
    }
```

```
    }
  }
  void display(int result[][10], int row, int column) {
    printf("\n----Matrix Multiplication Result----\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);
    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);
    }
    getMatrixElements(first, r1, c1);
    getMatrixElements(second, r2, c2);
    multiplyMatrices(first, second, result, r1, c1, r2, c2);
    display(result, r1, c2);
    return 0;
  }
```

Output:

```
Enter rows and column for the first matrix: 2
2
Enter rows and column for the second matrix: 2
2
Enter element 11: 6
Enter element 12: 7
Enter element 21: 4
Enter element 22: 9
Enter element 11: 4
Enter element 12: 2
Enter element 21: 1
Enter element 22: 0

----Matrix Multiplication Result----
31  12
25  8
```

Q3. Write a Program to multiply two matrices

Program Code:

```
#include <stdio.h>
int main() {
  int a[10][10], transpose[10][10], r, c;
  printf("Enter rows and columns: ");
  scanf("%d %d", &r, &c);
  printf("\nEnter matrix elements:\n");
  for (int i = 0; i < r; ++i)
  for (int j = 0; j < c; ++j) {
    printf("Enter element a%d%d: ", i + 1, j + 1);
    scanf("%d", &a[i][j]);
  }
  printf("\nEntered matrix: \n");
  for (int i = 0; i < r; ++i)
  for (int j = 0; j < c; ++j) {
    printf("%d  ", a[i][j]);
    if (j == c - 1)
    printf("\n");
  }
  for (int i = 0; i < r; ++i)
  for (int j = 0; j < c; ++j) {
    transpose[j][i] = a[i][j];
  }
  printf("\n----Transpose of the matrix----\n");
  for (int i = 0; i < c; ++i)
  for (int j = 0; j < r; ++j) {
    printf("%d  ", transpose[i][j]);
    if (j == r - 1)
    printf("\n");
  }
  return 0;
}
```

Output:

```
Enter rows and columns: 2
2

Enter matrix elements:
Enter element a11: 12
Enter element a12: 11
Enter element a21: 14
Enter element a22: 16

Entered matrix:
12  11
14  16

----Transpose of the matrix----
12  14
11  16
```