Experiment 1: Matrix Multiplication

Aim:

To write a C program to multiply two matrices.

Algorithm:

1. Start.
2. Input rows and columns of first matrix.
3. Input rows and columns of second matrix.
4. Check if multiplication is possible (c1 == r2).
5. Read both matrices.
6. Multiply: C[i][j] = Σ (A[i][k] * B[k][j]).
7. Print the result.
8. Stop.

Code:

```
#include <stdio.h>

int main() {
    int A[10][10], B[10][10], C[10][10];
    int r1, c1, r2, c2, i, j, k;

    printf("Enter rows and columns of first matrix: ");
    scanf("%d %d", &r1, &c1);
    printf("Enter rows and columns of second matrix: ");
    scanf("%d %d", &r2, &c2);

    if (c1 != r2) {
        printf("Matrix multiplication not possible!\n");
        return 0;
    }

    printf("Enter elements of first matrix:\n");
    for(i = 0; i < r1; i++)
        for(j = 0; j < c1; j++)
```

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

    printf("Enter elements of second matrix:\n");
    for(i = 0; i < r2; i++)
        for(j = 0; j < c2; j++)
            scanf("%d", &B[i][j]);

    for(i = 0; i < r1; i++) {
        for(j = 0; j < c2; j++) {
            C[i][j] = 0;
            for(k = 0; k < c1; k++)
                C[i][j] += A[i][k] * B[k][j];
        }
    }

    printf("Resultant Matrix:\n");
    for(i = 0; i < r1; i++) {
        for(j = 0; j < c2; j++)
            printf("%d ", C[i][j]);
        printf("\n");
    }

    return 0;
}
```

Sample Output:

```
Enter rows and columns of first matrix: 2 2
Enter rows and columns of second matrix: 2 2
Enter elements of first matrix:
1 2 3 4
Enter elements of second matrix:
5 6 7 8
Resultant Matrix:
19 22
43 50


=== Code Execution Successful ===
```

Result:

Matrix multiplication is successfully performed.