



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE NAME : 23ITT101- PROBLEM SOLVING & C PROGRAMMING

I YEAR /I SEMESTER

Unit II – ARRAYS AND STRINGS

Topic : Matrix Addition and Subtraction



Matrix Addition

- Matrix addition in C involves adding corresponding elements from two matrices of the same dimensions. The result of adding two matrices is another matrix of the same size, where each element is the sum of the corresponding elements from the original matrices.



Example: Matrix Addition



```
// matrix addition
#include <stdio.h>

int main() {
    int r, c, a[10][10], b[10][10], sum[10][10], i, j;
    printf("Enter the number of rows (between 1 and 10): ");
    scanf("%d", &r);
    printf("Enter the number of columns (between 1 and 10): ");
    scanf("%d", &c);

    printf("\nEnter %d elements of 1st matrix:\n",r*c);
    for (i = 0; i < r; ++i)
        for (j = 0; j < c; ++j) {
            scanf("%d", &a[i][j]);
        }
    printf("Enter %d elements of 2nd matrix:\n",r*c);
    for (i = 0; i < r; ++i)
        for (j = 0; j < c; ++j) {
            scanf("%d", &b[i][j]);
        }
}
```

```
// adding two matrices
for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
        sum[i][j] = a[i][j] + b[i][j];
    }

// printing the result
printf("\nSum 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:

Enter number of rows (between 1 and 10): 2
Enter the number of columns (between 1 and 10): 3

Enter 6 elements of 1st matrix:
1 2 3
4 5 6

Enter 6 elements of 2nd matrix:
7 8 9
10 11 12

Sum of two matrices:
8 10 12
14 16 18



Matrix Subtraction

- Matrix subtraction is similar to matrix addition, where we subtract corresponding elements of two matrices of the same size. The result of the subtraction will be another matrix of the same dimensions, where each element is the difference of the corresponding elements from the original matrices.



Example: Matrix Addition



```
// matrix subtraction
#include <stdio.h>

int main() {
    int r, c, a[10][10], b[10][10], diff[10][10], i, j;
    printf("Enter the number of rows (between 1 and 10): ");
    scanf("%d", &r);
    printf("Enter the number of columns (between 1 and 10): ");
    scanf("%d", &c);

    printf("\nEnter %d elements of 1st matrix:\n",r*c);
    for (i = 0; i < r; ++i)
        for (j = 0; j < c; ++j) {
            scanf("%d", &a[i][j]);
        }
    printf("Enter %d elements of 2nd matrix:\n",r*c);
    for (i = 0; i < r; ++i)
        for (j = 0; j < c; ++j) {
            scanf("%d", &b[i][j]);
        }
}
```

```
//subtracting two matrices
for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
        diff[i][j] = a[i][j] - b[i][j];
    }
// printing the result
printf("\nDifference of two matrices: \n");
for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
        printf("%d ", diff[i][j]);
        if (j == c - 1) {
            printf("\n\n");
        }
    }
return 0;
}
```

Output:

Enter number of rows (between 1 and 10): 2
Enter the number of columns (between 1 and 10): 3

Enter 6 elements of 1st matrix:
7 8 9
10 11 12

Enter 6 elements of 2nd matrix:
1 2 3
4 5 6

Difference of two matrices:
6 6 6
6 6 6

