



C PROGRAMING / LINUX [DASL-100]

WEEK 3 [Section 6]

INSTRUCTOR: JEAN CHAGAS VAZ



Thursday, June 08, 2017, 10:07

➤ C Program to Add Two Matrix Using Multi-dimensional Arrays

➤ This program takes two matrices of order $r \times c$ and stores it in two-dimensional array. Then, the program adds these two matrices and displays it on the screen.

```
Enter number of rows (between 1 and 100): 2
Enter number of columns (between 1 and 100): 3

Enter elements of 1st matrix:
Enter element a11: 2
Enter element a12: 3
Enter element a13: 4
Enter element a21: 5
Enter element a22: 2
Enter element a23: 3
Enter elements of 2nd matrix:
Enter element a11: -4
Enter element a12: 5
Enter element a13: 3
Enter element a21: 5
Enter element a22: 6
Enter element a23: 3

Sum of two matrix is:

-2   8   7
10   8   6
```

```
#include <stdio.h>
int main(){
    int r, c, a[100][100], b[100][100], sum[100][100], i, j;

    printf("Enter number of rows (between 1 and 100): ");
    scanf("%d", &r);
    printf("Enter number of columns (between 1 and 100): ");
    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 a%d%d: ", i+1, j+1);
            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];
        }

    // Displaying the result
    printf("\nSum of two matrix is: \n\n");

    for(i=0; i<r; ++i)
        for(j=0; j<c; ++j)
        {
            printf("%d\t", sum[i][j]);

            if(j==c-1)
            {
                printf("\n\n");
            }
        }

    return 0;
}
```

➤ C Program to Multiply to Matrix Using Multi-dimensional Arrays

➤ This program takes two matrices of order $r1 \times c1$ and $r2 \times c2$ respectively. Then, the program multiplies these two matrices (if possible) and displays it on the screen.

```
#include <stdio.h>

int main()
{
    int a[10][10], b[10][10], result[10][10], r1, c1, r2, c2, i, j, k;

    printf("Enter rows and column for first matrix: ");
    scanf("%d %d", &r1, &c1);

    printf("Enter rows and column for second matrix: ");
    scanf("%d %d", &r2, &c2);

    // Column of first matrix should be equal to column of second matrix and
    while (c1 != r2)
    {
        printf("Error! column of first matrix not equal to row of second.\n\n");
        printf("Enter rows and column for first matrix: ");
        scanf("%d %d", &r1, &c1);
        printf("Enter rows and column for second matrix: ");
        scanf("%d %d", &r2, &c2);
    }

    // Storing elements of first matrix.
    printf("\nEnter elements of matrix 1:\n");
    for(i=0; i<r1; ++i)
        for(j=0; j<c1; ++j)
        {
            printf("Enter elements a%d%d: ", i+1, j+1);
            scanf("%d", &a[i][j]);
        }
}
```

```
// Storing elements of second matrix.
printf("\nEnter elements of matrix 2:\n");
for(i=0; i<r2; ++i)
    for(j=0; j<c2; ++j)
    {
        printf("Enter elements b%d%d: ", i+1, j+1);
        scanf("%d", &b[i][j]);
    }

// Initializing all elements of result matrix to 0
for(i=0; i<r1; ++i)
    for(j=0; j<c2; ++j)
    {
        result[i][j] = 0;
    }

// Multiplying matrices a and b and
// storing result in result matrix
for(i=0; i<r1; ++i)
    for(j=0; j<c2; ++j)
        for(k=0; k<c1; ++k)
        {
            result[i][j] += a[i][k] * b[k][j];
        }

// Displaying the result
printf("\nOutput Matrix:\n");
for(i=0; i<r1; ++i)
    for(j=0; j<c2; ++j)
    {
        printf("%d ", result[i][j]);
        if(j == c2-1)
            printf("\n\n");
    }
return 0;
}
```



Thursday, June 08, 2017, 10:36

➤ C Program to Convert Binary Number to Octal and vice-versa

➤ In this example, you will learn to convert binary number to octal and octal number to binary manually by creating a header file.

➤ Main ()

```
#include <stdio.h>
#include <math.h>
#include "convertBinarytoOctal.h"

int main()
{
    long long binaryNumber;

    printf("Enter a binary number: ");
    scanf("%lld", &binaryNumber);

    printf("%lld in binary = %d in octal", binaryNumber, convertBinarytoOctal(binaryNumber));

    return 0;
}
```

➤ Header file()

```
int convertBinarytoOctal(long long binaryNumber)
{
    int octalNumber = 0, decimalNumber = 0, i = 0;

    while(binaryNumber != 0)
    {
        decimalNumber += (binaryNumber%10) * pow(2,i);
        ++i;
        binaryNumber/=10;
    }

    i = 1;

    while (decimalNumber != 0)
    {
        octalNumber += (decimalNumber % 8) * i;
        decimalNumber /= 8;
        i *= 10;
    }

    return octalNumber;
}
```



Thursday, June 08, 2017, 10:37

➤ **To do List**

- Finish Homework 3
- C Program to Find Transpose of a Matrix (**DUE NEXT SECTION**)
- Research and write a brief summary on “pointers” applied to C and C++ Language [Make sure to give two examples] (**DUE NEXT SECTION**)