**#2. Array Operations**

**Roll Number: CB.EN.P2EBS22003**

**Date of Submission: 01-Nov-2022**

**Aim:**

To perform following array operations using C Programming:

1. Create a 3-dimensional matrix of dimension 3x3x3. The entries inside the matrix can be as shown below,
2. Perform matrix multiplication of two 3x3 matrix. Matrix data shall be acquired from the user. User defined function can be used for matrix multiplication operation.

**Tools Required:**

Text editor with C Compiler.

**Experiment:**

1. **Code**

#include <stdio.h>

int main()

{

int m,n,l,i,j,k;

printf("Enter the number of matrices in 3D matrix:\n");

scanf("%d",&m);

printf("Enter the number of rows in 3D matrix:\n");

scanf("%d",&n);

printf("Enter the number of columns in 3D matrix:\n");

scanf("%d",&l);

int a[m][n][l];

for(i=0;i<1;i++){

for(j=0;j<n;j++){

for(k=0;k<l;k++){

printf("a[%d][%d][%d]=",i,j,k);

scanf("%d",&a[i][j][k]);

a[1][j][k]=2\*a[i][j][k];

a[2][j][k]=2\*a[1][j][k];

}

}

}

for(i=0;i<m;i++){

printf("The %d dimension matirx is:\n",i+1);

for(j=0;j<n;j++){

for(k=0;k<l;k++){

printf("%d ",a[i][j][k]);

}

printf("\n");

}

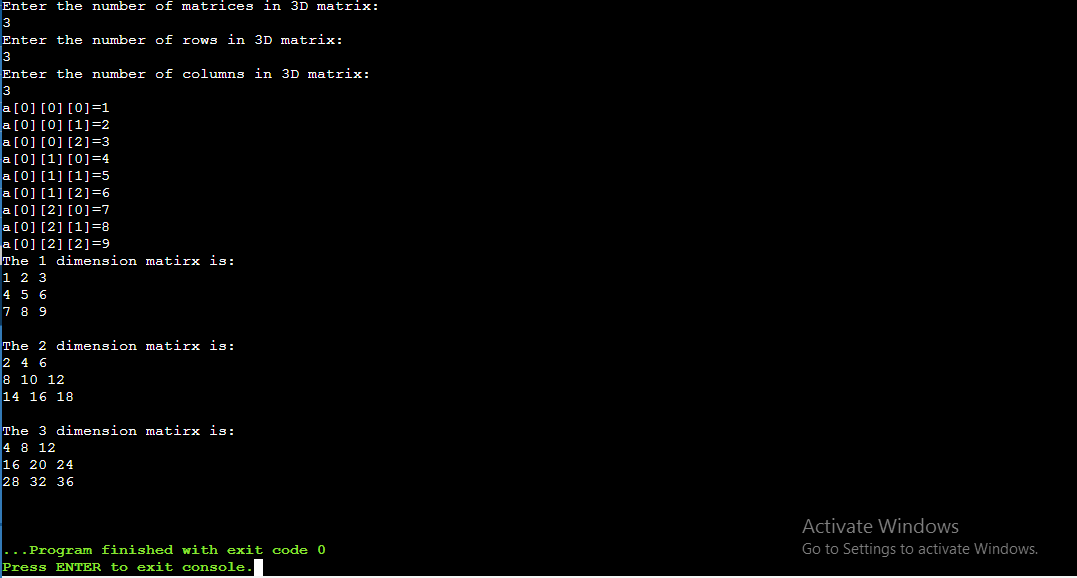
printf("\n");

}

return 0;

}

**Result:**



1. **Code**

#include<stdio.h>

void multiply(int r1, int c1, int r2, int c2,float a[][c1],float b[][c2])

{

int i,j,k;

float mul[r1][c2];

for(i=0;i< r1;i++)

{

for(j=0;j< c2;j++)

{

mul[i][j] = 0;

for(k=0;k< r2;k++)

{

mul[i][j] = mul[i][j] + a[i][k]\*b[k][j];

}

}

}

printf("Multiplied matrix is:\n");

for(i=0;i< r1;i++)

{

for(j=0;j< c2;j++)

{

printf("%f\t", mul[i][j]);

}

printf("\n");

}

}

int main()

{

int i,j,k,r1,c1,r2,c2;

printf("Enter row and column of first matrix\n");

scanf("%d%d", &r1, &c1);

printf("Enter row and column of second matrix\n");

scanf("%d%d", &r2, &c2);

float a[r1][c1], b[r2][c2];

if(c1==r2)

{

printf("Enter elements of first matrix:\n");

for(i=0;i< r1;i++)

{

for(j=0;j< c1;j++)

{

printf("a[%d][%d]=",i,j);

scanf("%f", &a[i][j]);

}

}

printf("Enter elements of second matrix:\n");

for(i=0;i< r2;i++)

{

for(j=0;j< c2;j++)

{

printf("b[%d][%d]=",i,j);

scanf("%f", &b[i][j]);

}

}

multiply(r1,c1,r2,c2,a,b);

}

else

{

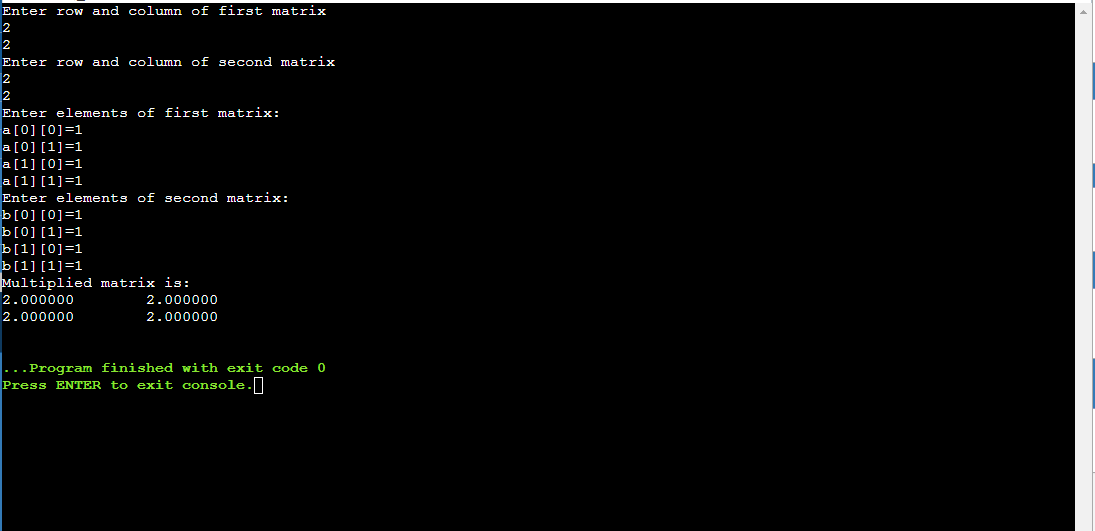
printf("Dimension do not match for multiplication.");

}

return 0;

}

**Result**



**Inference and Result:**

Thus, have worked with array manipulation for single dimensional and multi dimensional has been learnt and implemented using the above programs