**#2. Array Operations**

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**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:**

Code

#include <stdio.h>

int main()

{

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

scanf("%d",&m);

scanf("%d",&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++){

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

}

}

}

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

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

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

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

}

printf("\n");

}

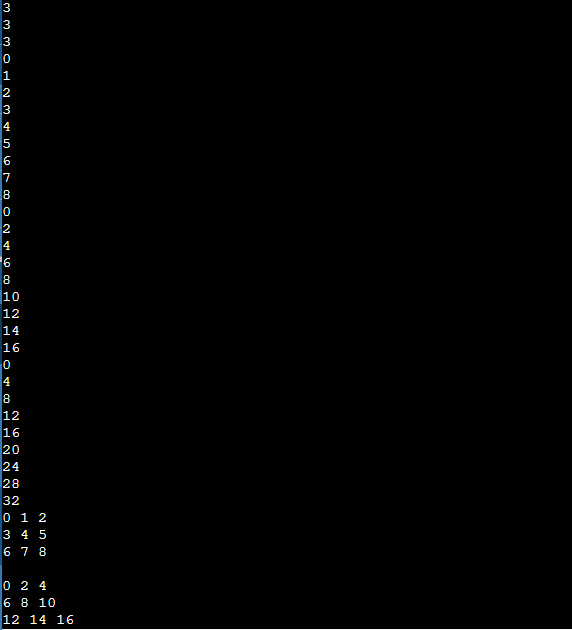
printf("\n");

}

return 0;

}

Result





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

{

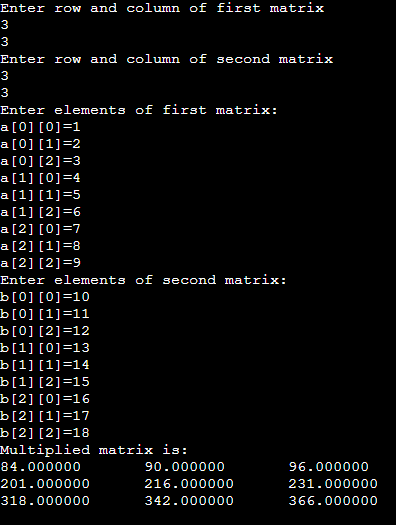
printf("Dimension does not match for multiplication.");

}

return 0;

}

Result



**Inference and Result:**

From the above codes, the 3-dimensional matrix with the dimension 3x3x3 has been created, obtained the elements from user and displayed. The matrix multiplication of two 3x3 matrix has been done using function and the result has been stored in the new matrix.