**Array assignment**

**1. Display marks of five students ?**

#include <stdio.h>

int main() {

int marks[5][5];

int i, j;

printf("Enter marks of 5 students in 5 subjects:\n");

for (i = 0; i < 5; i++) {

printf("Student %d:\n", i+1);

for (j = 0; j < 5; j++) {

printf("Subject %d: ", j+1);

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

}

}

printf("\nMarks of 5 students in 5 subjects:\n");

printf(" Tam Eng Mat Sci Soc\n");

for (i = 0; i < 5; i++) {

printf("%d ", i+1);

for (j = 0; j < 5; j++) {

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

}

printf("\n");

}

return 0;

}

**2. Insert five subjects marks of five students?**

#include <stdio.h>

int main() {

int marks[5][5] = {

{90, 85, 95, 92, 88},

{88, 92, 89, 90, 85},

{76, 81, 78, 80, 82},

{95, 98, 96, 97, 94},

{82, 86, 84, 83, 81} };

int i, j;

printf("Marks of Five Students:\n");

printf("Student\tTam\tEng\tMat\tSci\tSoc\n");

for (i = 0; i < 5; i++) {

printf("Student %d\t%d\t%d\t%d\t%d\t%d\n",

i + 1,

marks[i][0],

marks[i][1],

marks[i][2],

marks[i][3],

marks[i][4]);

}

return 0;

}

**3. Addition of two arrays ?**

#include <stdio.h>

int main() {

int arr1[2][2] = {{1, 2}, {3, 4}};

int arr2[2][2] = {{5, 6}, {7, 8}};

int sum[2][2];

for (int i = 0; i < 2; i++) {

for (int j = 0; j < 2; j++) {

sum[i][j] = arr1[i][j] + arr2[i][j];

}

}

printf("Sum of arrays:\n");

for (int i = 0; i < 2; i++) {

for (int j = 0; j < 2; j++) {

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

}

printf("\n");

}

return 0;

}

**4. Addition of 3d arrays ?**

#include <stdio.h>

int main() {

int arr1[2][2][2] = {{{1, 2}, {3, 4}}, {{5, 6}, {7, 8}}};

int arr2[2][2][2] = {{{9, 10}, {11, 12}}, {{13, 14}, {15, 16}}};

int sum[2][2][2];

for (int i = 0; i < 2; i++) {

for (int j = 0; j < 2; j++) {

for (int k = 0; k < 2; k++) {

sum[i][j][k] = arr1[i][j][k] + arr2[i][j][k];

}

}

}

printf("Sum of 3D arrays:\n");

for (int i = 0; i < 2; i++) {

for (int j = 0; j < 2; j++) {

for (int k = 0; k < 2; k++) {

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

}

printf("\n");

}

printf("\n");

}

return 0;

}

**5. Subtraction of 2d arrays ?**

#include <stdio.h>

int main() {

int arr1[2][2] = {{10, 12}, {14, 16}};

int arr2[2][2] = {{5, 6}, {7, 8}};

int sub[2][2];

for (int i = 0; i < 2; i++) {

for (int j = 0; j < 2; j++) {

sub[i][j] = arr1[i][j] - arr2[i][j];

}

}

printf("Subtraction of 2D arrays:\n");

for (int i = 0; i < 2; i++) {

for (int j = 0; j < 2; j++) {

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

}

printf("\n");

}

return 0;

}

**6. Subtraction of 3d arrays ?**

#include <stdio.h>

int main() {

int arr1[2][2][2] = {{{10, 12}, {14, 16}}, {{18, 20}, {22, 24}}};

int arr2[2][2][2] = {{{5, 6}, {7, 8}}, {{9, 10}, {11, 12}}};

int sub[2][2][2];

for (int i = 0; i < 2; i++) {

for (int j = 0; j < 2; j++) {

for (int k = 0; k < 2; k++) {

sub[i][j][k] = arr1[i][j][k] - arr2[i][j][k];

}

}

}

printf("Subtraction of 3D arrays:\n");

for (int i = 0; i < 2; i++) {

for (int j = 0; j < 2; j++) {

for (int k = 0; k < 2; k++) {

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

}

printf("\n");

}

printf("\n");

}

return 0;

}

**7. Transpose of a matrix 2d array ?**

#include <stdio.h>

int main() {

int arr[3][3] = {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}};

int transpose[3][3];

int i, j;

for (i = 0; i < 3; i++) {

for (j = 0; j < 3; j++) {

transpose[j][i] = arr[i][j];

}

}

printf("Original Matrix:\n");

for (i = 0; i < 3; i++) {

for (j = 0; j < 3; j++) {

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

}

printf("\n");

}

printf("\nTranspose Matrix:\n");

for (i = 0; i < 3; i++) {

for (j = 0; j < 3; j++) {

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

}

printf("\n");

}

return 0;

}

**8. Transpose of a matrix 3d array ?**

#include <stdio.h>

int main() {

int arr[2][3][2] = {{{1, 2}, {3, 4}, {5, 6}}, {{7, 8}, {9, 10}, {11, 12}}};

int transpose[3][2][2];

int i, j, k;

for (i = 0; i < 3; i++) {

for (j = 0; j < 2; j++) {

for (k = 0; k < 2; k++) {

transpose[i][k][j]=arr[k][i][j];

}

}

}

printf("Original Matrix:\n");

for (i = 0; i < 2; i++) {

for (j = 0; j < 3; j++) {

for (k = 0; k < 2; k++) {

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

}

printf("\n");

}

printf("\n");

}

printf("\nTranspose Matrix:\n");

for (i = 0; i < 3; i++) {

for (j = 0; j < 2; j++) {

for (k = 0; k < 2; k++) {

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

}

printf("\n");

}

printf("\n");

}

return 0;

}

**9. Multiplication of matrix 2d array ?**

#include <stdio.h>

int main() {

int arr1[2][2] = {{1, 2}, {3, 4}};

int arr2[2][2] = {{5, 6}, {7, 8}};

int multi[2][2];

int i, j, k;

// Calculate product

for (i = 0; i < 2; i++) {

for (j = 0; j < 2; j++) {

multi[i][j] = 0;

for (k = 0; k < 2; k++) {

multi[i][j] += arr1[i][k] \* arr2[k][j];

}

}

}

// Print matrices and multi

printf("Matrix 1:\n");

for (i = 0; i < 2; i++) {

for (j = 0; j < 2; j++) {

printf("%d ", arr1[i][j]);

}

printf("\n");

}

printf("\nMatrix 2:\n");

for (i = 0; i < 2; i++) {

for (j = 0; j < 2; j++) {

printf("%d ", arr2[i][j]);

}

printf("\n");

}

printf("\nMultiplication:\n");

for (i = 0; i < 2; i++) {

for (j = 0; j < 2; j++) {

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

}

printf("\n");

}

return 0;

}

**10. Multiplication of matrix 3d array ?**

#include <stdio.h>

int main() {

int arr1[2][2][2] = {{{1, 2}, {3, 4}}, {{5, 6}, {7, 8}}};

int arr2[2][2][2] = {{{9, 10}, {11, 12}}, {{13, 14}, {15, 16}}};

int multi[2][2][2];

int i, j, k, l, m;

// Calculate multi

for (i = 0; i < 2; i++) {

for (j = 0; j < 2; j++) {

for (k = 0; k < 2; k++) {

multi[i][j][k] = 0;

for (l = 0; l < 2; l++) {

for (m = 0; m < 2; m++) {

multi[i][j][k] += arr1[i][l][m] \* arr2[l][j][k];

}

}

}

}

}

// Print matrices and multi

printf("Matrix 1:\n");

for (i = 0; i < 2; i++) {

for (j = 0; j < 2; j++) {

for (k = 0; k < 2; k++) {

printf("%d ", arr1[i][j][k]);

}

printf("\n");

}

printf("\n");

}

printf("Matrix 2:\n");

for (i = 0; i < 2; i++) {

for (j = 0; j < 2; j++) {

for (k = 0; k < 2; k++) {

printf("%d ", arr2[i][j][k]);

}

printf("\n");

}

printf("\n");

}

printf("Product:\n");

for (i = 0; i < 2; i++) {

for (j = 0; j < 2; j++) {

for (k = 0; k < 2; k++) {

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

}

printf("\n");

}

printf("\n");

}

return 0;

}