**SVKM’s NMIMS**

**Mukesh Patel School of Technology Management and Engineering, Mumbai**

**Department of Electronics & Telecommunication**



**Programming for Problem Solving (Exp 7)**

|  |  |
| --- | --- |
| **Roll No: J001** | **Name: Adith Ramakrishna** |
| **Program: B. Tech Data Science (1st)** | **Batch: J1** |
| **Date of Experiment: 10/10/2022** | **Date of Submission: 10/10/2022** |

**Task 1:**

123450

**Task 2:**

#include <iostream>

using namespace std;

int main() {

int size\_arr\_x, size\_arr\_y;

cout << "Enter the size of the array (x,y): ";

cin >> size\_arr\_x >> size\_arr\_y;

int two\_dim\_arr[size\_arr\_x][size\_arr\_y];

cout << endl;

for (int x = 0; x < size\_arr\_x; x++) {

for (int y = 0; y < size\_arr\_y; y++) {

cout << "Enter the value at (" << x + 1 << ", " << y + 1 << "): ";

cin >> two\_dim\_arr[x][y];

}

}

int choice, sum\_diagonal = 0, transpose\_arr[size\_arr\_y][size\_arr\_x];

cout << "\nChoose an option:\n1. Sum of elements of each row\n2. Sum of diagonal elements\n3. Finding transpose of matrix\n";

cin >> choice;

switch (choice) {

case 1:

cout << "\nSum of elements of Rows:\n";

for (int x = 0; x < size\_arr\_x; x++) {

int sum\_row = 0;

for (int y = 0; y < size\_arr\_y; y++) {

sum\_row += two\_dim\_arr[x][y];

}

cout << x + 1 << ": " << sum\_row << endl;

}

break;

case 2:

for (int x = 0; x < size\_arr\_x; x++) {

for (int y = 0; y < size\_arr\_y; y++) {

if (x == y) {

sum\_diagonal += two\_dim\_arr[x][y];

}

}

}

cout << "\nSum of Diagonal Elements:" << sum\_diagonal << endl;

break;

case 3:

cout << "\nTranspose Array:\n";

for (int x = 0; x < size\_arr\_x; x++) {

for (int y = 0; y < size\_arr\_y; y++) {

transpose\_arr[y][x] = two\_dim\_arr[x][y];

}

}

for (int x = 0; x < size\_arr\_y; x++) {

for (int y = 0; y < size\_arr\_x; y++) {

cout << " " << transpose\_arr[x][y] << " ";

}

cout << endl;

}

break;

default:

cout << "\nThat is not a valid option!";

break;

}

return 0;

}

**Task 3:**

#include <iostream>

using namespace std;

int main() {

int size\_arr\_m, size\_arr\_n;

cout << "Enter the size of the array A (m x n): ";

cin >> size\_arr\_m >> size\_arr\_n;

int arr\_A[size\_arr\_m][size\_arr\_n];

cout << endl;

for (int m = 0; m < size\_arr\_m; m++) {

for (int n = 0; n < size\_arr\_n; n++) {

cout << "Enter the value at A (" << m + 1 << ", " << n + 1 << "): ";

cin >> arr\_A[m][n];

}

}

int size\_arr\_p, size\_arr\_q;

cout << "\nEnter the size of the array B (p x q): ";

cin >> size\_arr\_p >> size\_arr\_q;

int arr\_B[size\_arr\_p][size\_arr\_q];

cout << endl;

for (int p = 0; p < size\_arr\_p; p++) {

for (int q = 0; q < size\_arr\_q; q++) {

cout << "Enter the value at B (" << p + 1 << ", " << q + 1 << "): ";

cin >> arr\_B[p][q];

}

}

int final\_arr[size\_arr\_m][size\_arr\_n];

for (int m = 0; m < size\_arr\_m; m++) {

for (int q = 0; q < size\_arr\_q; q++) {

final\_arr[m][q] = 0;

}

}

if (size\_arr\_n == size\_arr\_p) {

for (int m = 0; m < size\_arr\_m; m++) {

for (int n = 0; n < size\_arr\_n; n++) {

for (int q = 0; q < size\_arr\_q; q++) {

final\_arr[m][q] += arr\_A[m][n] \* arr\_B[n][q];

}

}

}

cout << "\n\nArray A:\n";

for (int m = 0; m < size\_arr\_m; m++) {

for (int n = 0; n < size\_arr\_n; n++) {

cout << " " << arr\_A[m][n] << " ";

}

cout << endl;

}

cout << "\n\nArray B:\n";

for (int p = 0; p < size\_arr\_p; p++) {

for (int q = 0; q < size\_arr\_q; q++) {

cout << " " << arr\_B[p][q] << " ";

}

cout << endl;

}

cout << "\n\nProduct Array:\n";

for (int m = 0; m < size\_arr\_m; m++) {

for (int q = 0; q < size\_arr\_q; q++) {

cout << " " << final\_arr[m][q] << " ";

}

cout << endl;

}

} else {

cout << "\nArrays are incompatible for multiplication! ";

}

return 0;

}

**Homework Questions:**

**1:**

#include <iostream>

using namespace std;

int main() {

int size\_arr\_x, size\_arr\_y;

cout << "Enter the size of the arrays (x,y): ";

cin >> size\_arr\_x >> size\_arr\_y;

int arr\_A[size\_arr\_x][size\_arr\_y], arr\_B[size\_arr\_x][size\_arr\_y], arr\_sum[size\_arr\_x][size\_arr\_y];

cout << endl;

for (int x = 0; x < size\_arr\_x; x++) {

for (int y = 0; y < size\_arr\_y; y++) {

cout << "Enter the value at A (" << x + 1 << ", " << y + 1 << "): ";

cin >> arr\_A[x][y];

}

}

cout << endl;

for (int x = 0; x < size\_arr\_x; x++) {

for (int y = 0; y < size\_arr\_y; y++) {

cout << "Enter the value at B (" << x + 1 << ", " << y + 1 << "): ";

cin >> arr\_B[x][y];

}

}

for (int x = 0; x < size\_arr\_x; x++) {

for (int y = 0; y < size\_arr\_y; y++) {

arr\_sum[x][y] = arr\_A[x][y] + arr\_B[x][y];

}

}

cout << "\n\nSum of Arrays:\n";

for (int x = 0; x < size\_arr\_y; x++) {

for (int y = 0; y < size\_arr\_x; y++) {

cout << " " << arr\_sum[x][y] << " ";

}

cout << endl;

}

return 0;

}