

# Assignment 4



# Shri G.S Institute of Technology & Science

## C Programming Lab

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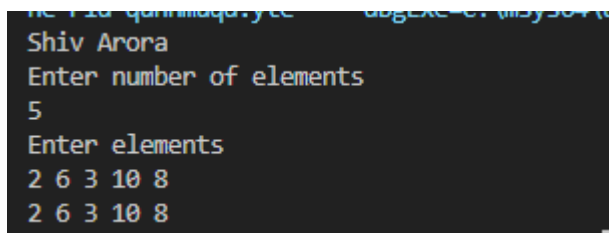
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P1 Write a program to store n no of elements in an array and print them.

```
#include<stdio.h>

int main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n; i++){
        scanf("%d", &arr[i]);
    }
    for(int i=0;i<n; i++){
        printf("%d ", arr[i]);
    }
    return 0;
}
```

OUTPUT:



```
Shiv Arora
Enter number of elements
5
Enter elements
2 6 3 10 8
2 6 3 10 8
```

P2 Write a program in C to find the maximum and minimum elements in an array.

```
#include<stdio.h>

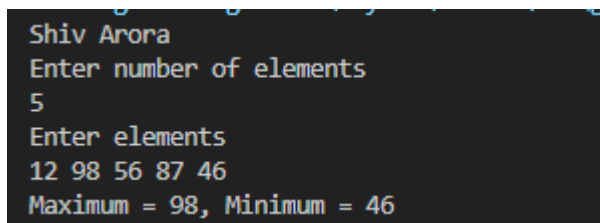
int main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n; i++){
```

```

        scanf("%d", &arr[i]);
    }
    int maxx = arr[0];
    int min = arr[0];
    for(int i=1;i<n; i++){
        if(arr[i] > maxx)
            maxx = arr[i];
        else if (arr[i]< min)
            min = arr[i];
    }
    printf("Maximum = %d, Minimum = %d", maxx, min);
    return 0;
}

```

OUTPUT:



```

Shiv Arora
Enter number of elements
5
Enter elements
12 98 56 87 46
Maximum = 98, Minimum = 46

```

P3 Write a program in C to sort elements of an array in ascending order.

```

#include<stdio.h>

int main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n; i++){
        scanf("%d", &arr[i]);
    }
    for(int i=0; i<n; i++) {
        for(int j=i+1; j<n; j++) {

```

```

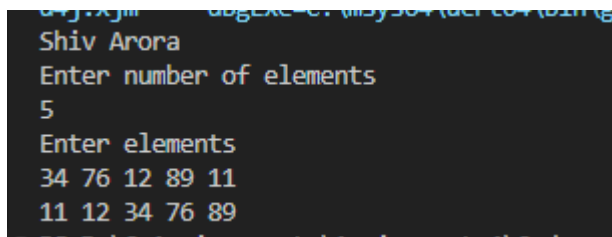
        if(arr[i]>arr[j]){
            int temp = arr[i];
            arr[i] = arr[j];
            arr[j] = temp;
        }
    }
}

for(int i=0;i<n; i++){
    printf("%d ", arr[i]);
}

return 0;
}

```

OUTPUT:



```

Shiv Arora
Enter number of elements
5
Enter elements
34 76 12 89 11
11 12 34 76 89

```

P4 Write a program in C to sort the elements of the array in descending order.

```

#include<stdio.h>

int main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n; i++){
        scanf("%d", &arr[i]);
    }
    for(int i=0; i<n; i++)
    {
        for(int j=i+1; j<n; j++) {

```

```

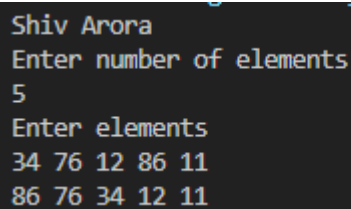
        if(arr[i] < arr[j]){
            int temp = arr[i];
            arr[i] = arr[j];
            arr[j] = temp;
        }
    }
}

for(int i=0;i<n; i++){
    printf("%d ", arr[i]);
}

return 0;
}

```

OUTPUT:



```

Shiv Arora
Enter number of elements
5
Enter elements
34 76 12 86 11
86 76 34 12 11

```

P5 Write a program in C to read n number of values in an array and display them in reverse order.

```

#include<stdio.h>

int main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n; i++){
        scanf("%d", &arr[i]);
    }
    for(int i=n-1;i>=0; i--){
        printf("%d ", arr[i]);
    }
}

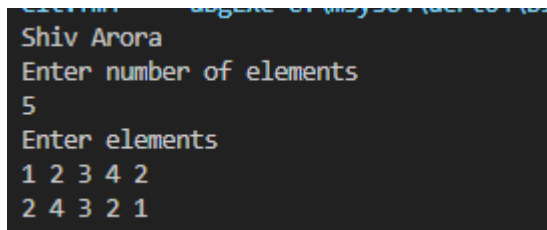
```

```

    return 0;
}

```

OUTPUT:



```

Shiv Arora
Enter number of elements
5
Enter elements
1 2 3 4 2
2 4 3 2 1

```

P6 Write a program in C to insert the values in the array (sorted list).

```

#include<stdio.h>

int main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n-1; i++){
        scanf("%d", &arr[i]);
    }
    int x;
    printf("Enter an elemet to insert\n");
    scanf("%d", &x);
    arr[n-1] = x;
    for(int i=0; i<n; i++){
        for(int j=i+1; j<n; j++) {
            if(arr[i]>arr[j]){
                int temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
    }
}

```

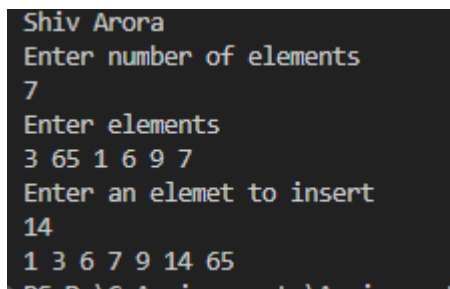


```

    for(int i=0;i<n; i++){
        printf("%d ", arr[i]);
    }
    return 0;
}

```

OUTPUT:



```

Shiv Arora
Enter number of elements
7
Enter elements
3 65 1 6 9 7
Enter an elemet to insert
14
1 3 6 7 9 14 65

```

P7 Write a program in C to insert values in the array (unsorted list).

```

#include<stdio.h>

int main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n-1; i++){
        scanf("%d", &arr[i]);
    }
    int x;
    printf("Enter an elemet to insert\n");
    scanf("%d", &x);
    arr[n-1] = x;
    for(int i=0;i<n; i++){
        printf("%d ", arr[i]);
    }
    return 0;
}

```

OUTPUT:

```
Shiv Arora
Enter number of elements
7
Enter elements
3 65 1 6 9 7
Enter an element to insert
14
3 65 1 6 9 7 14
```

P8 Write a program in C to find the sum of all elements of the array.

```
#include<stdio.h>

int main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n; i++){
        scanf("%d", &arr[i]);
    }
    int sum = 0;
    for(int i=0;i<n; i++){
        sum += arr[i];
    }
    printf("%d", sum);
    return 0;
}
```

OUTPUT:

```
Shiv Arora
Enter number of elements
5
Enter elements
12 13 15 18 19
77
```

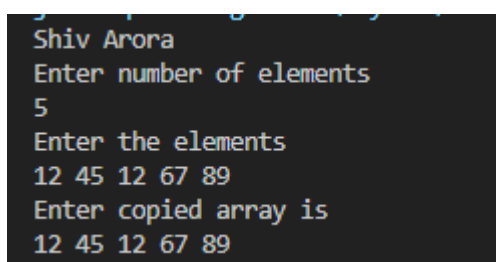
P9 Write a program in C to copy the elements of one array into another array.

```
#include <stdio.h>

void main() {
    printf("Shiv Arora\n");
    int size;
    printf("Enter number of elements\n");
    scanf("%d", &size);
    printf("Enter the elements\n");
    int arr[size];
    for(int i=0;i<size; i++){
        scanf("%d", &arr[i]);
    }
    int destination[size];

    for (int i = 0; i < size; i++) {
        destination[i] = arr[i];
    }
    printf("Enter copied array is\n");
    for (int i = 0; i < size; i++) {
        printf("%d ", destination[i]);
    }
}
```

OUTPUT:

A screenshot of a terminal window showing the execution of the C program. The output is as follows:  
Shiv Arora  
Enter number of elements  
5  
Enter the elements  
12 45 12 67 89  
Enter copied array is  
12 45 12 67 89

P10 Write a program in C to merge two arrays of the same size sorted in descending order.

```
#include <stdio.h>

void main() {
    printf("Shiv Arora\n");
    int size;
```

```
printf("Enter the number of elements: ");
scanf("%d", &size);

printf("Enter elements of the 1st array:\n");
int arr1[size];
for (int i = 0; i < size; i++) {
    scanf("%d", &arr1[i]);
}

printf("Enter elements of the 2nd array:\n");
int arr2[size];
for (int i = 0; i < size; i++) {
    scanf("%d", &arr2[i]);
}

int final[size * 2];
for (int i = 0; i < size; i++) {
    final[i] = arr1[i];
}

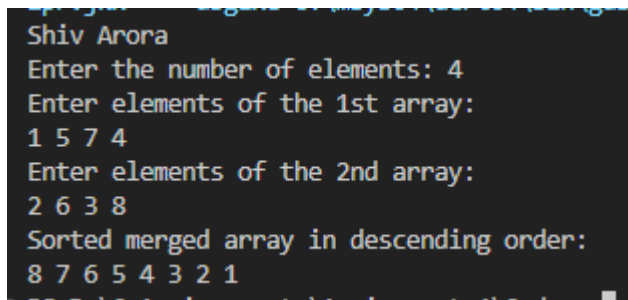
for (int i = 0; i < size; i++) {
    final[size + i] = arr2[i];
}

for (int i = 0; i < size * 2; i++) {
    for (int j = i + 1; j < size * 2; j++) {
        if (final[i] < final[j]) {
            int temp = final[i];
            final[i] = final[j];
            final[j] = temp;
        }
    }
}

printf("Sorted merged array in descending order:\n");
for (int i = 0; i < size * 2; i++) {
    printf("%d ", final[i]);
}
```

```
printf("\n");
}
```

OUTPUT:



```
Shiv Arora
Enter the number of elements: 4
Enter elements of the 1st array:
1 5 7 4
Enter elements of the 2nd array:
2 6 3 8
Sorted merged array in descending order:
8 7 6 5 4 3 2 1
```

P11 Write a program in C to count the total number of duplicate elements in an array.

```
#include<stdio.h>

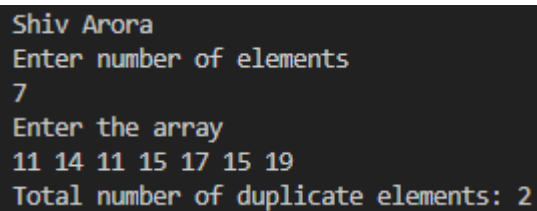
void main(){
    printf("Shiv Arora\n");
    int size, count=0;
    printf("Enter number of elements\n");
    scanf("%d", &size);
    int arr[size], freq[size];
    printf("Enter the array\n");
    for(int i=0;i<size; i++){
        scanf("%d", &arr[i]);
        freq[i] = -1;
    }
    for (int i = 0; i < size; i++) {
        int duplicateCount = 1;
        for (int j = i + 1; j < size; j++) {
            if (arr[i] == arr[j]) {
                duplicateCount++;
                freq[j] = 0;
            }
        }
        if (freq[i] != 0) {
            freq[i] = duplicateCount;
        }
    }
}
```

```

    }
    for (int i = 0; i < size; i++) {
        if (freq[i] > 1) {
            count++;
        }
    }
    printf("Total number of duplicate elements: %d\n", count);
}

```

OUTPUT:



```

Shiv Arora
Enter number of elements
7
Enter the array
11 14 11 15 17 15 19
Total number of duplicate elements: 2

```

P12 Write a program in C to delete an element at a desired position from an array.

```

#include<stdio.h>

void main(){
    printf("Shiv Arora\n");
    int size, pos;
    printf("Enter number of elements\n");
    scanf("%d", &size);
    int arr[size];
    printf("Enter the array\n");
    for(int i=0;i<size; i++){
        scanf("%d", &arr[i]);
    }
    printf("Enter the position of the element to delete (1 to %d): ", size);
    scanf("%d", &pos);

    for (int i = pos - 1; i < size - 1; i++) {
        arr[i] = arr[i + 1];
    }
}

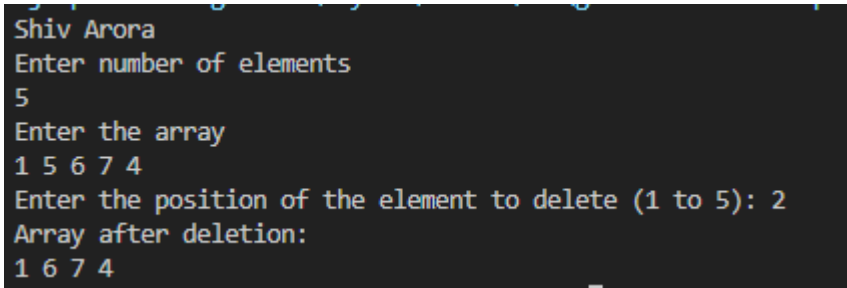
```

```

size--;
printf("Array after deletion:\n");
for (int i = 0; i < size; i++) {
    printf("%d ", arr[i]);
}
printf("\n");
}

```

OUTPUT:



```

Shiv Arora
Enter number of elements
5
Enter the array
1 5 6 7 4
Enter the position of the element to delete (1 to 5): 2
Array after deletion:
1 6 7 4

```

P13 Write a program in C to find the second largest element in an array.

```

#include<stdio.h>

void main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n; i++){
        scanf("%d", &arr[i]);
    }

    for(int i=0; i<n; i++)
    {
        for(int j=i+1; j<n; j++) {
            if(arr[i] < arr[j]){
                int temp = arr[i];
                arr[i] = arr[j];
            }
        }
    }
}

```

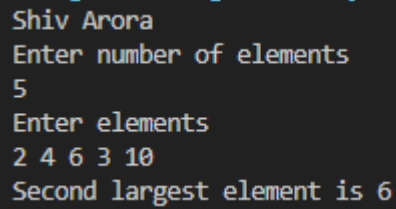
```

        arr[j] = temp;
    }
}
}

printf("Second largest element is %d ", arr[1]);
}

```

OUTPUT:



```

Shiv Arora
Enter number of elements
5
Enter elements
2 4 6 3 10
Second largest element is 6

```

P14 Write a program in C to find the second smallest element in an array.

```

#include<stdio.h>

void main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter number of elements\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter elements\n");
    for(int i=0;i<n; i++){
        scanf("%d", &arr[i]);
    }

    for(int i=0; i<n; i++)
    {
        for(int j=i+1; j<n; j++) {
            if(arr[i]>arr[j]){
                int temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
    }
}

```

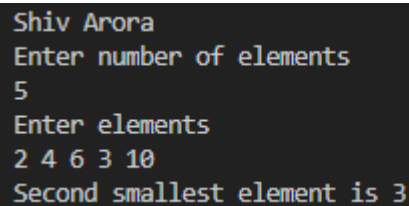


```

    }
}
printf("Second smallest element is %d ", arr[1]);
}

```

OUTPUT:



```

Shiv Arora
Enter number of elements
5
Enter elements
2 4 6 3 10
Second smallest element is 3

```

P15 Write a program in C for a 2D array of size 2x2 and print the matrix.

```

#include<stdio.h>

void main(){
    printf("Shiv Arora\n");
    int r, c;
    printf("Enter number of rows and columns\n");
    scanf("%d %d", &r, &c);
    int arr[r][c];
    printf("Enter elements\n");
    for(int i=0;i<r; i++){
        for(int j=0;j<c; j++){
            scanf("%d", &arr[i][j]);
        }
    }
    printf("The 2D array is\n");
    for(int i=0;i<r; i++){
        for(int j=0;j<c; j++){
            printf("%d ", arr[i][j]);
        }
        printf("\n");
    }
}

```

OUTPUT:

```
Shiv Arora
Enter number of rows and columns
3 3
Enter elements
1 2 3
2 4 5
1 5 6
The 2D array is
1 2 3
2 4 5
1 5 6
```

P16 Write a program in C for adding two matrices of the same size.

```
#include <stdio.h>

void main() {
    printf("Shiv Arora\n");
    int r, c;

    printf("Enter the number of rows and columns : ");
    scanf("%d %d", &r, &c);

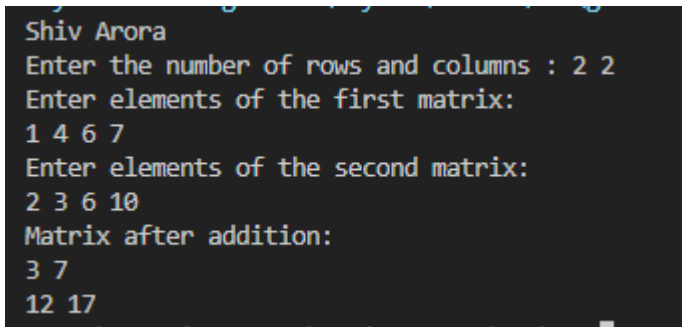
    int mat1[r][c], mat2[r][c], sum[r][c];
    printf("Enter elements of the first matrix:\n");
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            scanf("%d", &mat1[i][j]);
        }
    }
    printf("Enter elements of the second matrix:\n");
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            scanf("%d", &mat2[i][j]);
        }
    }
    printf("Matrix after addition:\n");
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
```

```

        sum[i][j] = printf("%d ", mat1[i][j] + mat2[i][j]);
    }
    printf("\n");
}
}

```

OUTPUT:



```

Shiv Arora
Enter the number of rows and columns : 2 2
Enter elements of the first matrix:
1 4 6 7
Enter elements of the second matrix:
2 3 6 10
Matrix after addition:
3 7
12 17

```

P17 Write a program in C for the subtraction of two matrices.

```

#include <stdio.h>

void main() {
    printf("Shiv Arora\n");

    int r, c;

    printf("Enter the number of rows and columns : ");
    scanf("%d %d", &r, &c);

    int mat1[r][c], mat2[r][c], sum[r][c];

    printf("Enter elements of the first matrix:\n");
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            scanf("%d", &mat1[i][j]);
        }
    }

    printf("Enter elements of the second matrix:\n");
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            scanf("%d", &mat2[i][j]);
        }
    }
}

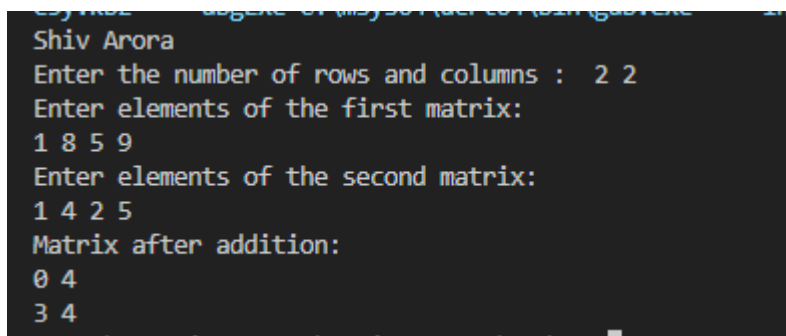
```

```

    }
    printf("Matrix after addition:\n");
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            sum[i][j] = printf("%d ", mat1[i][j] - mat2[i][j]);
        }
        printf("\n");
    }
}

```

OUTPUT:



```

Shiv Arora
Enter the number of rows and columns : 2 2
Enter elements of the first matrix:
1 8 5 9
Enter elements of the second matrix:
1 4 2 5
Matrix after addition:
0 4
3 4

```

P18 Write a program in C for the **multiplication** of two square matrices.

```

#include<stdio.h>

void main(){
    printf("Shiv Arora\n");
    int n;
    printf("Enter the matrix size :");
    scanf("%d", &n);
    int mat1[n][n], mat2[n][n];
    printf("Enter elements of the first matrix:\n");
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            scanf("%d", &mat1[i][j]);
        }
    }
    printf("Enter elements of the second matrix:\n");
    for (int i = 0; i < n; i++) {

```

```

        for (int j = 0; j < n; j++) {
            scanf("%d", &mat2[i][j]);
        }
    }

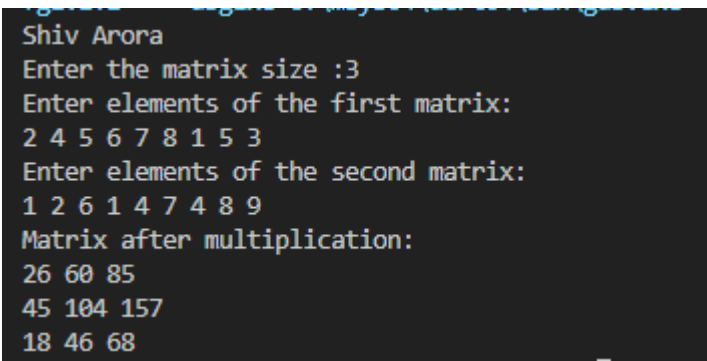
    int result[n][n];
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            result[i][j] = 0;
        }
    }

    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            for (int k = 0; k < n; k++) {
                result[i][j] += mat1[i][k] * mat2[k][j];
            }
        }
    }

    printf("Matrix after multiplication:\n");
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            printf("%d ", result[i][j]);
        }
        printf("\n");
    }
}

```

OUTPUT:



```

Shiv Arora
Enter the matrix size :3
Enter elements of the first matrix:
2 4 5 6 7 8 1 5 3
Enter elements of the second matrix:
1 2 6 1 4 7 4 8 9
Matrix after multiplication:
26 60 85
45 104 157
18 46 68

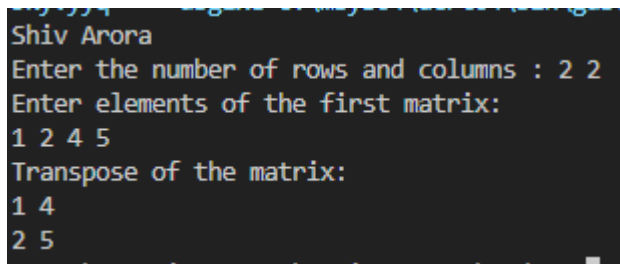
```

P19 Write a program in C to find the transpose of a given matrix.

```
#include <stdio.h>

void main() {
    printf("Shiv Arora\n");
    int r, c;
    printf("Enter the number of rows and columns : ");
    scanf("%d %d", &r, &c);
    int mat[r][c], transpose[r][c];
    printf("Enter elements of the first matrix:\n");
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            scanf("%d", &mat[i][j]);
        }
    }
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            transpose[j][i] = mat[i][j];
        }
    }
    printf("Transpose of the matrix:\n");
    for (int i = 0; i < c; i++) {
        for (int j = 0; j < r; j++) {
            printf("%d ", transpose[i][j]);
        }
        printf("\n");
    }
}
```

OUTPUT:



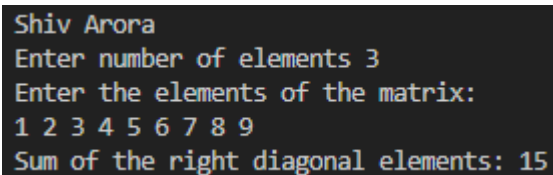
```
Shiv Arora
Enter the number of rows and columns : 2 2
Enter elements of the first matrix:
1 2 4 5
Transpose of the matrix:
1 4
2 5
```

P20 Write a program in C to find the sum of the right diagonals of a matrix.

```
#include <stdio.h>

void main() {
    printf("Shiv Arora\n");
    int n, sum = 0;
    printf("Enter number of elements ");
    scanf("%d", &n);
    int mat[n][n];
    printf("Enter the elements of the matrix:\n");
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            scanf("%d", &mat[i][j]);
        }
    }
    for (int i = 0; i < n; i++) {
        sum += mat[i][n - i - 1];
    }
    printf("Sum of the right diagonal elements: %d\n", sum);
}
```

OUTPUT:



```
Shiv Arora
Enter number of elements 3
Enter the elements of the matrix:
1 2 3 4 5 6 7 8 9
Sum of the right diagonal elements: 15
```

P21 Write a program in C to find the sum of rows and columns of a matrix.

```
#include <stdio.h>

void main() {
    printf("Shiv Arora\n");
    int r, c;
    printf("Enter the number of rows and columns: ");
    scanf("%d %d", &r, &c);
    int matrix[r][c];
    int rowSum[r], colSum[c];
```

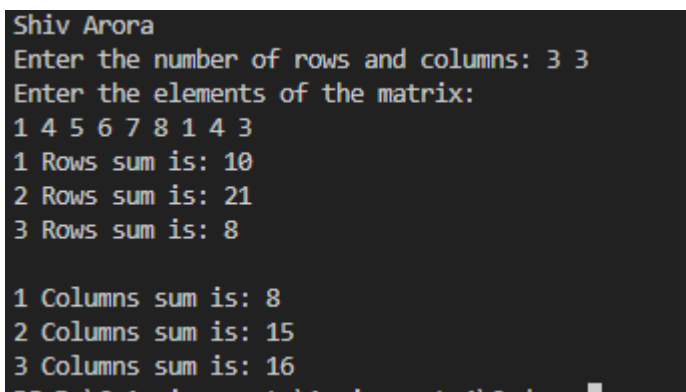
```

for (int i = 0; i < r; i++) rowSum[i] = 0;
for (int j = 0; j < c; j++) colSum[j] = 0;
printf("Enter the elements of the matrix:\n");
for (int i = 0; i < r; i++) {
    for (int j = 0; j < c; j++) {
        scanf("%d", &matrix[i][j]);
    }
}
for (int i = 0; i < r; i++) {
    for (int j = 0; j < c; j++) {
        rowSum[i] += matrix[i][j];
        colSum[j] += matrix[i][j];
    }
}
// Rows sums
for (int i = 0; i < r; i++) {
    printf("%d Rows sum is: %d\n", i + 1, rowSum[i]);
}

printf("\n");
// Column sums
for (int i = 0; i < c; i++) {
    printf("%d Columns sum is: %d\n", i + 1, colSum[i]);
}
}

```

OUTPUT:



```

Shiv Arora
Enter the number of rows and columns: 3 3
Enter the elements of the matrix:
1 4 5 6 7 8 1 4 3
1 Rows sum is: 10
2 Rows sum is: 21
3 Rows sum is: 8

1 Columns sum is: 8
2 Columns sum is: 15
3 Columns sum is: 16

```



P22 Write a program in C to check whether a given matrix is an identity.

```
#include <stdio.h>

void main() {
    printf("Shiv Arora\n");
    int n, isIdentity = 1;
    printf("Enter number of elements\n");
    scanf("%d", &n);

    int mat[n][n];
    printf("Enter the elements of the matrix:\n");
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            scanf("%d", &mat[i][j]);
        }
    }
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            if (i == j && mat[i][j] != 1) {
                isIdentity = 0;
            } else if (i != j && mat[i][j] != 0) {
                isIdentity = 0;
            }
        }
    }
    if (isIdentity) {
        printf("The matrix is an identity matrix.\n");
    } else {
        printf("The matrix is NOT an identity matrix.\n");
    }
}
```

OUTPUT:

```
Shiv Arora
Enter number of elements
3
Enter the elements of the matrix:
1 0 0 0 1 0 0 0 1
The matrix is an identity matrix.
```



# Shri G.S Institute of Technology & Science

## C Programming Lab

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3	Write a C program to print all alphabets from a to z. – using while loop	2	
4	Write a C program to print all even numbers between 1 to 100. – using while loop	2-3	
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15	Write a C program to calculate product of digits of a number.	9	
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17	Write a C program to find frequency of each digit in a given integer.	10-11	
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