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**S.no: 1**

**Program Title:** Program to check the given number is prime or not

**Source code**

#include <iostream>

#include <cmath>

using namespace std;

int main()

{

    int x;

    cout << "Please enter the no. here : ";

    cin >> x;

    if (x <= 1)

    {

        cout << x << " is not prime";

    }

    else

    {

        int limit = sqrt(x);

        bool isPrime = true;

        for (int i = 2; i <= limit; i++)

        {

            if (x % i == 0)

            {

                cout << x << " is not prime";

                isPrime = false;

                break;

            }

        }

        if (isPrime)

        {

            cout << "The number is prime";

        }

    }

    return 0;

}

**TEST CASES:**

**Case 1;**

Input = 2



**Case 2;**

Input = 10



**Case 3;**

Input = 7



**S.no: 2**

**Program Title:** Program to check the given number is Armstrong

**Source code**

#include <iostream>

#include <cmath>

using namespace std;

bool isArmstrong(int);

int digitCount(int);

int main()

{

    for (int i = 0; i < 100000; i++)

    {

        if (isArmstrong(i))

        {

            cout << i << endl;

        }

    }

    return 0;

}

int digitCount(int x)

{

    if (x == 0)

        return 1;

    int dCount = 0;

    while (x > 0)

    {

        x /= 10;

        dCount++;

    }

    return dCount;

}

bool isArmstrong(int x)

{

    int value = x;

    int digits = digitCount(x);

    int sum = 0;

    while (x > 0)

    {

        sum += pow(x % 10, digits);

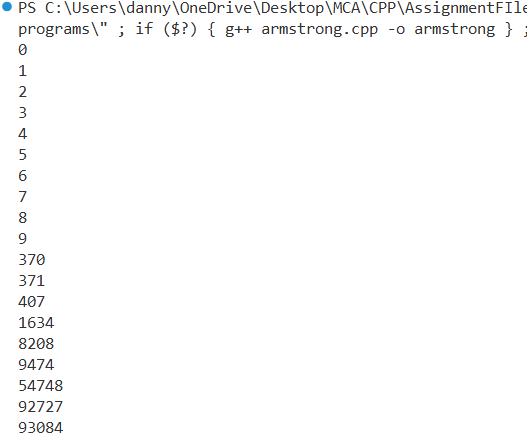
        x /= 10;

    }

    return value == sum;

}

**OUTPUT:**

****

**S.no: 3**

**Program Title:** Program to find the factorial of the given number

**Source code**

#include <iostream>

using namespace std;

int factorial(int n)

{

    return (n <= 1) ? 1 : n \* factorial(n - 1);

}

int main()

{

    int n;

    cout << "Enter the number : ";

    cin >> n;

    cout << "Factorial of " << n << " is " << factorial(n);

    return 0;

}

**TEST CASES:**

**Case 1;**

Input = 5



**Case 2;**

Input = 6



**Case 3;**

Input = 0



**S.no: 4**

**Program Title:** Program to check the number is odd or even

**Source code**

#include <iostream>

using namespace std;

bool isEven(int x)

{

    return x % 2 == 0;

}

int main()

{

    int x;

    cout << "Enter the number here : ";

    cin >> x;

    cout << x << " is " << (isEven(x) ? "even" : "odd");

    return 0;

}

**TEST CASES:**

**Case 1;**

Input = 10



**Case 2;**

Input = 5



**Case 3;**

Input = 0



**S.no: 5**

**Program Title:** Program using function

**Source code**

#include <iostream>

using namespace std;

int factorial(int n);

int main()

{

    int n;

    cout << "Enter the number : ";

    cin >> n;

    cout << "Factorial of " << n << " is " << factorial(n);

    return 0;

}

// Finding factorial using a function

int factorial(int n)

{

    if (n <= 1)

    {

        return 1;

    }

    else

    {

        return n \* factorial(n - 1);

    }

}

**TEST CASES:**

**Case 1;**

Input = 6



**S.no: 6**

**Program Title:** Program using function

**Source code**

#include <iostream>

#include "arrayprint.h"

using namespace std;

int min(int[], int);

int max(int[], int);

int main()

{

    // array input

    int arr[100], n;

    cout << "Enter number of elements: ";

    cin >> n;

    for (int i = 0; i < n; i++)

    {

        cin >> arr[i];

    }

    cout << "Min : " << min(arr, n) << endl;

    cout << "Min : " << max(arr, n);

    return 0;

}

int min(int ar[], int size)

{

    int mn = ar[0];

    for (int i = 0; i < size; i++)

    {

        int c = ar[i];

        mn = (mn > c) ? c : mn;

    }

    return mn;

}

int max(int ar[], int size)

{

    int mx = ar[0];

    for (int i = 0; i < size; i++)

    {

        mx = (mx < ar[i]) ? ar[i] : mx;

    }

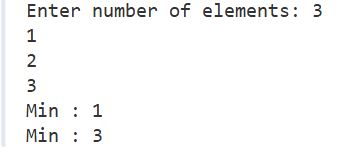
    return mx;

}

**TEST CASES:**

**Case 1;**

Input = [1,2,3]



**S.no: 7**

**Program Title:** Sum of numbers in array.

**Source code**

#include <iostream>

using namespace std;

int sum(int ar[], int size)

{

    int sm = 0;

    for (int i = 0; i < size; i++)

    {

        sm += ar[i];

    }

    return sm;

}

int main()

{

    // array input

    int arr[100], n;

    cout << "Enter number of elements: ";

    cin >> n;

    for (int i = 0; i < n; i++)

    {

        cin >> arr[i];

    }

    cout << "Sum of the elements of the array : " << sum(arr, n);

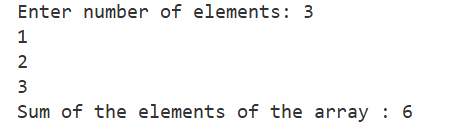
    return 0;

}

**TEST CASES:**

**Case 1;**

Input = [1,2,3]



**S.no: 8**

**Program Title:** Even / Odd using array.

**Source code**

#include <iostream>

using namespace std;

void even\_fliter(int arr[], int size)

{

    cout << "Even numbers are : ";

    for (int i = 0; i < size; i++)

    {

        if (arr[i] % 2 == 0)

        {

            cout << arr[i] << ",";

        }

    }

    cout << "\n-----------------\n";

}

void odd\_fliter(int arr[], int size)

{

    cout << "Odd numbers are : ";

    for (int i = 0; i < size; i++)

    {

        if (arr[i] % 2)

        {

            cout << arr[i] << ",";

        }

    }

    cout << "\n-----------------\n";

}

int main()

{

    int arr[10] = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};

    even\_fliter(arr, 10);

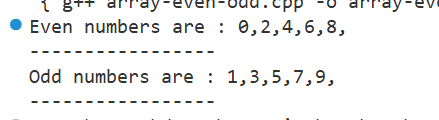
    odd\_fliter(arr, 10);

    return 0;

}

**Output**

array **=** [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]



**S.no: 9**

**Program Title:** Sum of 2d array.

**Source code**

#include <iostream>

using namespace std;

void print(int ar[][3])

{

    for (int i = 0; i < 3; i++)

    {

        for (int j = 0; j < 3; j++)

        {

            cout << ar[i][j] << "|";

        }

        cout << endl;

    }

}

void sum(int ar1[][3], int ar2[][3])

{

    int result[3][3];

    int range = 9;

    for (int i = 0; i < 9; i++)

    {

        result[i / 3][i % 3] = ar1[i / 3][i % 3] + ar2[i / 3][i % 3];

    }

    print(result);

}

int main()

{

    int ar1[3][3] = {{1, 2, 3}, {2, 3, 4}, {4, 5, 6}};

    int ar2[3][3] = {{3, 2, 1}, {4, 3, 2}, {6, 5, 4}};

    cout << "Array1" << endl;

    print(ar1);

    cout << "Array2" << endl;

    print(ar2);

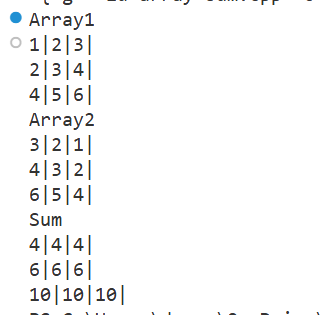
    cout << "Sum " << endl;

    sum(ar1, ar2);

    return 0;

}

**Output**



**S.no: 10**

**Program Title:** Program of Structure

**Source code**

#include <iostream>

using namespace std;

struct Person

{

    string name;

    int age;

    void show\_details()

    {

        cout << name << "'s age is " << age;

    }

};

int main()

{

    struct Person p;

    p.name = "John";

    p.age = 10;

    p.show\_details();

    return 0;

}

**Output**

****

**S.no: 11**

**Program Title:** Program to print table of the given number by user.

**Source code**

#include <iostream>

using namespace std;

void table\_print(int number)

{

    for (int i = 1; i <= 10; i++)

    {

        cout << number << " x " << i << " = " << number \* i << endl;

    }

}

int main()

{

    int i;

    cout << "Enter the number here: ";

    cin >> i;

    table\_print(i);

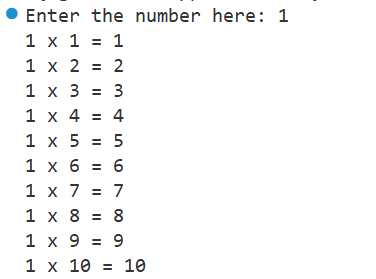
    return 0;

}

**Test Cases**

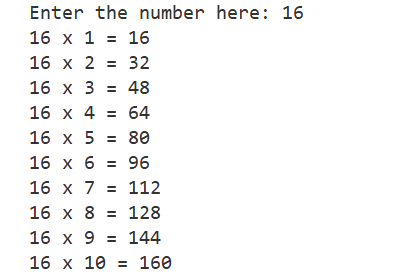
**Case 1;**

input =1

****

**Case 2;**

input =16



**S.no: 12**

**Program Title:** Program array passed by reference.

**Source code**

#include <iostream>

using namespace std;

int double\_elements(int array[], int size)

{

    for (int i = 0; i < size; i++)

    {

        array[i] = array[i] \* 2;

    }

}

int main()

{

    int arr[3] = {1, 2, 3};

    cout << "Before the Call\n";

    for (int e : arr)

    {

        cout << e << ",";

    }

    double\_elements(arr, 3);

    cout << "\nAfter the Call\n";

    // the array is modified here too

    for (int e : arr)

    {

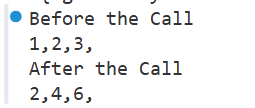
        cout << e << ",";

    }

    return 0;

}

**OUTPUT**

****