INDEX

Danishwer

0026MCA25

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

```
Please enter the no. here : 2
The number is prime
```

Case 2;

Input = 10

```
Please enter the no. here : 10
10 is not prime
```

Case 3;

Input = 7

```
Please enter the no. here : 7
The number is prime
```

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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:

```
PS C:\Users\danny\OneDrive\Desktop\MCA\CPP\AssignmentFIle
programs\" ; if ($?) { g++ armstrong.cpp -o armstrong } ;
0
1
2
3
4
5
6
7
8
9
370
371
407
1634
8208
9474
54748
92727
93084
```

S.no: 3

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

Source code

```cpp
#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

```
Enter the number : 5
Factorial of 5 is 120
```

Case 2;

Input = 6

```
Enter the number : 6
Factorial of 6 is 720
```

Case 3;

Input = 0

```
Enter the number : 0
Factorial of 0 is 1
```

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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

```
Enter the number here : 10
10 is even
```

Case 2;

Input = 5

```
Enter the number here : 5
5 is odd
```

Case 3;

Input = 0

```
Enter the number here : 0
0 is even
```

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S.no: 5

Program Title: Program using function

Source code

```cpp
#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

```
Enter the number : 6
Factorial of 6 is 720
```

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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]

```
Enter number of elements: 3
1
2
3
Min : 1
Min : 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]

```
Enter number of elements: 3
1
2
3
Sum of the elements of the array : 6
```

S.no: 8

Program Title: Even / Odd using array.

Source code

```cpp
#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]

```
❯ g++ array-even-odd.cpp -o array-evo
Even numbers are : 0,2,4,6,8,
-----------------
Odd numbers are : 1,3,5,7,9,
-----------------
```

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

```
Array1
1|2|3|
2|3|4|
4|5|6|
Array2
3|2|1|
4|3|2|
6|5|4|
Sum
4|4|4|
6|6|6|
10|10|10|
```

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

```
PS C:\Users\Danishwer\Desktop\0026MCA25> g++ structure.cp
PS C:\Users\Danishwer\Desktop\0026MCA25> ./a
John's age is 10
```

S.no: 11

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

Source code

```cpp
#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;
}
```

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Test Cases

Case 1;

input =1

```
Enter the number here: 1
1 x 1 = 1
1 x 2 = 2
1 x 3 = 3
1 x 4 = 4
1 x 5 = 5
1 x 6 = 6
1 x 7 = 7
1 x 8 = 8
1 x 9 = 9
1 x 10 = 10
```

Case 2;

input =16

```
Enter the number here: 16
16 x 1 = 16
16 x 2 = 32
16 x 3 = 48
16 x 4 = 64
16 x 5 = 80
16 x 6 = 96
16 x 7 = 112
16 x 8 = 128
16 x 9 = 144
16 x 10 = 160
```

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

```
Before the Call
1,2,3,
After the Call
2,4,6,
```