**LAB MANUAL**

C++ Programming Lab

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**19bcs003**

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1. *Program to check whether a no. is even or odd.*

#include <iostream> using namespace std ; int main() { int n;

cout << "enter the number \n";

cin >> n;

if (n % 2 == 0)

cout << "number is even\n";

else

cout << "number is odd\n";

}

Program Execution

|  |  |  |
| --- | --- | --- |
| Sr. No. | Input | Output |
| 1. | 15 | 15 is odd no. |
| 2. | 18 | 18 is even no. |
| 3. | 0 | 0 is even no. |

**2. Program to display first 10 prime numbers.**

#include<iostream>

using namespace std;

int main()

{

int i,j,count=1,b=0;

cout<<"First Ten Prime Numbers Are\n"<<"2";

for(i=3;i>0;++i)

{

for(j=2;j<=i/2;++j)

{

if(i%j==0){

b=1;

break;

}

}

if(b==0)

{

cout<<"\n"<<i;

count++;

}

b=0;

if(count==10)

break;

}

return 0;

}

|  |  |  |
| --- | --- | --- |
|  | **First 10 prime nos. are : 2 3 5 7 11 13 17 19 23 29** |  |

**3) Program to display prime numbers from 1 to n.**

#include <iostream>

using namespace std;

int main() {

int num, i, upto;

// Take input from user

cout << "Find prime numbers upto : ";

cin >> upto;

cout << endl << "All prime numbers upto " << upto << " are : " << endl;

for(num = 2; num <= upto; num++) {

for(i = 2; i <= (num / 2); i++) {

if(num % i == 0) {

i = num;

break;

}

}

// If the number is prime then print it.

if(i != num) {

cout << num << " ";

}

}

return 0;

}

|  |  |  |
| --- | --- | --- |
|  | INPUT |  |
| 1 | 30 | All prime numbers upto 30 are : 3 5 7 11 13 17 19 23 29 |
| 2 | 19 | All prime numbers upto 19 are : 3 5 7 11 13 17 19 |

**4**)**Program to check whether a given no. is prime or not**

#include <iostream>

using namespace std;

int main()

{

  int n, i, m=0, flag=0;

  cout << "Enter the Number to check Prime: ";

  cin >> n;

  m=n/2;

  for(i = 2; i <= m; i++)

  {

      if(n % i == 0)

      {

          cout<<"Number is not Prime."<<endl;

          flag=1;

          break;

      }

  }

  if (flag==0)

      cout << "Number is Prime."<<endl;

  return 0;

}

|  |  |  |
| --- | --- | --- |
|  | input | output |
| 1 | 80 | Number is not prime |
| 2 | 17 | Number is prime |

**5) Program to find sum of n natural numbers.**

#include <iostream>

using namespace std;

int main()

{

int n, sum = 0;

cout << "Enter a positive integer: ";

cin >> n;

for (int i = 1; i <= n; ++i) {

sum += i;

}

cout << "Sum = " << sum;

return 0;

}

|  |  |  |
| --- | --- | --- |
|  | INPUT | OUTPUT |
| 1 | 28 | Sum=406 |
| 2 | 40 | Sum=820 |

**6)Program to find whether a given year is a leap year or not.**

#include <iostream>

using namespace std;

int main()

{

int year;

cout << "Enter the year in yyyy format : ";

cin >> year;

if (year % 4 == 0)

cout << year << " is a leap year";

else

cout << year << " is not a leap year";

}

|  |  |  |
| --- | --- | --- |
|  | INPUT | OUTPUT |
| 1 | 2054 | 2054 is not a leap year |
| 2 | 2000 | 2000 is a leap year |

**7)Program to find the ASCII value of a given character**

#include<iostream>

using namespace std;

int main ()

{

char c;

cout << "Enter a character : ";

cin >> c;

cout << "ASCII value of " << c <<" is : " << (int)c;

return 0;

}

|  |  |  |
| --- | --- | --- |
|  | INPUT | OUTPUT |
| 1 | h | ASCII value of h is104 |
| 2 | D | ASCII value of A is 68 |

**8)Program to find duplicate characters in a string.**

#include<iostream>

using namespace std;

bool present(char \*arr,int index,char temp);

void duplicate(string word){

int len=0,index=0;

while(word[len]!='\0') // finding length of string

len+=1;

char arr[len]; // Storing repeated characters

for(int i=0;i<len;i++)

for(int j=i+1;j<len;j++){

if(word[i]==word[j] and !present(arr,index,word[i])){

cout << word[j] << " "; //printing the repetead words only once

arr[index] = word[i]; //storing repeated elements

index+=1;

}}

if(index==0){

cout << "There's no repeated character in the string.";

}}

// to remove duplicate char repetition

bool present(char \*arr,int index,char temp){

int flag=0;

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

if(arr[i]==temp)

return true;

else

flag+=1;

}

if(flag==index and index!=0)

return false;

else

return false;

}

int main(){

string word;

cout << "Please enter string " << endl;

//use getline function instead of cin

getline(cin,word); //We didn't use simply cin because it breaks the string at spaces

duplicate(word);

return 0;

}

|  |  |  |
| --- | --- | --- |
|  | INPUT | OUTPUT |
| 1 | Deepu | e |
| 2 | abhinav | a |

**9)Program to check whether a string is palindrome or not.**

#include <iostream>

#include <string.h>

using namespace std;

int main()

{

char str1[20], str2[20];

int i, j, len = 0, flag = 0;

cout << "Enter the string : ";

gets(str1);

len = strlen(str1) - 1;

for (i = len, j = 0; i >= 0 ; i--, j++)

str2[j] = str1[i];

if (strcmp(str1, str2))

flag = 1;

if (flag == 1)

cout << str1 << " is not a palindrome";

else

cout << str1 << " is a palindrome";

return 0;

}

|  |  |  |
| --- | --- | --- |
| 1 |  |  |
| 2 | I am me | Not a palindrome |
| 3 | sunnyynnus | Is a palindrome |

**10)Program to find factorial of a given no.**

#include<iostream>

using namespace std;

int main() {

int num,factorial=1;

cout<<" Enter Number To Find Its Factorial: ";

cin>>num;

for (int a=1;a<=num;a++) {

factorial=factorial\*a;

}

cout<<"Factorial of Given Number is ="<<factorial<<endl;

return 0;

}

|  |  |  |
| --- | --- | --- |
|  | INPUT | OUTPUT |
| 1 | 3 | 6 |
| 2 | 6 | 720 |

**11.  Program to display Fibonacci series upto 100.**

#include<iostream>

int main()

{

int fib1 = 0, fib2 = 1, fib3 = 1;

std::cout << "The Fibonacci Series is follows : " << std::endl << fib1 << " " << fib2 << " ";

while (fib1 + fib2 < 100)

{

fib3 = fib1 + fib2;

fib1 = fib2;

fib2 = fib3;

std::cout << fib3 << " ";

}

std::cout << std::endl;

return 0;

}

|  |  |  |
| --- | --- | --- |
| **S.N** | **Input** | **Output** |
| **1.** | **NA** | **The Fibonacci Series is follows :**  **0 1 1 2 3 5 8 13 21 34 55 89** |

**12. Program to sort a given set of numbers in ascending and descending order.**

#include<iostream>

int main()

{int a[100],n,i,j;

std::cout<< "enter Array size: ";

std::cin>>n;

std::cout<<"enter Elements: ";

for(i=0;i<n;i++)

{

std::cin>>a[i];

}

for (int i = 0; i < n; i++)

for (int j = 0; j < n; j++)

{

if (a[j] > a[i])

{

int tmp = a[i];

a[i] = a[j];

a[j] = tmp;

}

}

}

std::cout<<"\n\nAscending : ";

for (int i = 0; i < n; i++)

{

std::cout<<a[i]<<" ";

}

for (int i = 0; i < n; i++)

{

for (int j = 0; j < n; j++)

{

if (a[j] < a[i])

{

int tmp = a[i];

a[i] = a[j];

a[j] = tmp;

}

}

}

std::cout<<"\n\nDescending : ";

for (int i = 0; i < n; i++) //Loop to print descending order

{

std::cout<<a[i]<<" " ;

}

return 0;

}}

|  |  |  |
| --- | --- | --- |
| **S.N** | **Input** | **Output** |
| **1.** | **4**  **22 3 2 80**  **22 66 88 98** | **Ascending : 2 3 22 80**  **Descending : 95 20 3 2** |
| **2.** | **5**  **3 2 4 9 1**  **12 56 0 23 11** | **Ascending : 1 2 3 4 9**  **Descending : 9 4 3 2 1** |

**13)Program to reverse a word in a string.**

#include <bits/stdc++.h>

using namespace std;

void rev(string s, int start , int end) {

int i,n = end - start + 1;

for (i = 0; i < n / 2; i++) { // loop to reverse the word

swap(s[i + start], s[n - i - 1 + start]);

}

for (i = 0; i < s.length(); i++) { // printing the resultant string

cout << s[i] ;} }

int main()

{

char s[150] ;

cout << "enter your string :->";

cin.getline(s,sizeof(s)); // gets input string and length of s

int start, end ;

cout << "Please enter start index and end index of substring:->";

cin >> start >> end ; //starting and ending index of string to be reverse

rev(s, start, end); //inbuilt function to reverse

return 0;

}

|  |  |  |
| --- | --- | --- |
| S.N | Input | Output |
| 1 | Hey what is the time  4 7 | Hey tahw is the time |
| 2 | Gonna get a cab now  12 14 | Gonna get a bac now |

**14)Check whether a given no. is Armstrong no. or not.**

#include <iostream>

using namespace std;

int main()

{

int n,r,sum=0,temp;

cout<<"Enter the Number= ";

cin>>n;

temp=n;

while(n>0)

{

r=n%10;

sum=sum+(r\*r\*r);

n=n/10;

}

if(temp==sum)

cout<<"Armstrong Number."<<endl;

else

cout<<"Not Armstrong Number."<<endl;

return 0;

}

|  |  |  |
| --- | --- | --- |
|  | INPUT | OUTPUT |
| 1 | 436 | Armstrong Number |
| 2 | 370 | Not an Armstrong Number |

**15)program to make calculator using switch statement**

# include <iostream>

using namespace std;

int main()

{

char op;

float num1, num2;

cout << "Enter operator either + or - or \* or /: ";

cin >> op;

cout << "Enter two operands: ";

cin >> num1 >> num2;

switch(op)

{

case '+':

cout << num1+num2;

break;

case '-':

cout << num1-num2;

break;

case '\*':

cout << num1\*num2;

break;

case '/':

cout << num1/num2;

break;

default:

// If the operator is other than +, -, \* or /, error message is shown

cout << "Error! operator is not correct";

break;

}

return 0;

}

|  |  |  |
| --- | --- | --- |
|  | INPUT | OUTPUT |
| 1 | +  2 40 | 42 |
| 2 | \*  6 10 | 60 |