## Friend-2(09-08-2024)

Author: ThanhTH

Date: 9/8/2024

1. Write a program in C++ to convert an octal number into binary using friend function.

#include <iostream>

#include <string>

using namespace std;

class Number

{

private:

    string num;

public:

    Number(string n) : num(n) {}

    friend string octolToBinary(const Number &num);

};

string octolToBinary(const Number &n)

{

    string octal = n.num;

    for (char c : octal)

    {

        if (c < '0' || c > '7')

        {

            throw invalid\_argument("Invalid octal number");

        }

    }

    // Convert the octal number to decimal

    int decimal = stoi(octal, nullptr, 8);

    string binary;

    while (decimal > 0)

    {

        binary = (decimal % 2 == 0 ? "0" : "1") + binary;

        decimal /= 2;

    }

    return binary;

}

int main()

{

    string octal;

    cout << "Enter a octal number: ";

    cin >> octal;

    Number d(octal);

    cout << "Binary Representation: " << octolToBinary(d) << endl;

    return 0;

}

1. Write a program in C++ to Check Whether a Number can be Express as Sum of Two Prime Numbers using the friend function.

#include <iostream>

using namespace std;

class Prime

{

    int num;

public:

    Prime(int n) : num(n) {}

    friend bool isPrime(const Prime &prime);

    friend bool isSumOfTwoNumber(const Prime &prime);

};

bool isPrime(const Prime &prime)

{

    int temp = prime.num;

    if (temp <= 1)

        return false;

    for (int i = 2; i \* i <= temp; i++)

    {

        if (temp % i == 0)

        {

            return false;

        }

    }

    return true;

}

bool isSumOfTwoNumber(const Prime &prime)

{

    int temp = prime.num;

    for (int i = 2; i < temp / 2; i++)

    {

        if (isPrime(Prime(i)) && isPrime(Prime(temp - i)))

        {

            return true;

        }

    }

    return false;

}

int main(int argc, char const \*argv[])

{

    int num;

    cout << "Enter a number: ";

    cin >> num;

    Prime p(num);

    cout << num << (isSumOfTwoNumber(p) ? " can be expressed as the sum of two prime numbers." : " cannot be expressed as the sum of two prime numbers.") << endl;

    return 0;

}

1. Write a C++ program to find the number and sum of all integer between 100 and 200 which are divisible by 9 with friend function.

#include <iostream>

using namespace std;

class Number

{

    int min;

    int max;

public:

    Number(int min, int max) : min(min), max(max) {}

    friend void sumOfDivisibleByNine(const Number &n);

};

void sumOfDivisibleByNine(const Number &n)

{

    int sum = 0;

    int count = 0;

    for (int i = n.min; i <= n.max; i++)

    {

        if (i % 9 == 0)

        {

            count++;

            sum += i;

        }

    }

    cout << "Number of numbers divisible by 9 is: " << count << endl;

    cout << "Sum of all numbers divisible by 9 is: " << sum << endl;

}

int main(int argc, char const \*argv[])

{

    int min = 100, max = 200;

    Number n(min, max);

    sumOfDivisibleByNine(n);

    return 0;

}

4.Fibonacci series C++ Program with friend function.

#include <iostream>

using namespace std;

class Number

{

    int number;

public:

    Number(int num) : number(num) {}

    friend void findFibonancy(const Number &n);

};

void findFibonancy(const Number &n)

{

    int a = 0;

    int b = 1;

    int next = 0;

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

    {

        cout << next << " ";

        next = a + b;

        a = b;

        b = next;

    }

}

int main(int argc, char const \*argv[])

{

    int n;

    cout << "Enter a number: ";

    cin >> n;

    Number num(n);

    findFibonancy(n);

    return 0;

}