Friend-2(09-08-2024)

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

```cpp
#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;
}
```

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

```cpp
#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;
}
```

3. 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;
}
```