CPP Problem Design Example

Subject: Prime Number

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Main testing concept: Class 設計

Basics	Functions
□ C++ BASICS	□ SEPARATE COMPILATION AND NAMESPACES
□ FLOW OF CONTROL	□ STREAMS AND FILE I/O
□ FUNCTION BASICS	□ RECURSION
□ PARAMETERS AND OVERLOADING	□ INHERITANCE
□ ARRAYS	□ POLYMORPHISM AND VIRTUAL FUNCTIONS
□ STRUCTURES AND CLASSES	□ TEMPLATES
■ CONSTRUCTORS AND OTHER TOOLS	□ LINKED DATA STRUCTURES
□ OPERATOR OVERLOADING, FRIENDS,AND REFERENCES	□ EXCEPTION HANDLING
	□ STANDARD TEMPLATE LIBRARY
□ STRINGS	□ PATTERNS AND UML
□ POINTERS AND DYNAMIC ARRAYS	

Description:

Define a class named **PrimeNumber** that stores a prime number.

- The class PrimeNumber has only one variable **value(int)**.

- The class PrimeNumber has two constructors:
  - ➢ **PrimeNumber()**: construct a PrimeNumber where the **value** is 1.
  - ➢ **PrimeNumber(int _value)**: construct a PrimeNumber where the **value** is _value.

- You should implement the following function:
  - ➢ **get**(): return the value of this PrimeNumber.

- And you are required to Overload all the following operators:
  - ➢ ++: return the next larger prime number.
  - ➢ --: return the next smaller prime number.
    ** If the PrimeNumber value equals to 2, -- operator should return 1. In the testing data, the PrimeNumber won't be less than 2.

Input:

The main() function in your submission will be replaced when judging.
You can use the main() function in "Other Notes" to test your program.
No inputs for this exercise.

Output:

The result of executing your program with the given main function.

Sample Input / Output：

	Sample Input	Sample Output
第一組測資與輸出	No inputs	2 2 13 17
…		

Expected solving time:

15 分鐘

Other notes:

```cpp
int main()
{
        PrimeNumber p1, p2(13);
        PrimeNumber a = ++p1;
        PrimeNumber b = p2++;
        cout << a.get() << endl;
        cout << p1.get() << endl;
        cout << b.get() << endl;
        cout << p2.get() << endl;
        system("pause");
        return 0;
}
```