**CPP Problem Design Example**

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| **Subject: Prime Number** |
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| **Main testing concept: Class 設計**   |  |  | | --- | --- | | **Basics** | **Functions** | | □ C++ BASICS  □ FLOW OF CONTROL  □ FUNCTION BASICS  □ PARAMETERS AND OVERLOADING  □ ARRAYS  □ STRUCTURES AND CLASSES  ■ CONSTRUCTORS AND OTHER TOOLS  □ OPERATOR OVERLOADING, FRIENDS,AND REFERENCES  □ STRINGS  □ POINTERS AND DYNAMIC ARRAYS | □ SEPARATE COMPILATION AND NAMESPACES  □ STREAMS AND FILE I/O  □ RECURSION  □ INHERITANCE  □ POLYMORPHISM AND VIRTUAL FUNCTIONS  □ TEMPLATES  □ LINKED DATA STRUCTURES  □ EXCEPTION HANDLING  □ STANDARD TEMPLATE LIBRARY  □ PATTERNS AND UML | |
| **Description:** Define a class named PrimeNumber that stores a prime number. The default constructor should set the prime number to 1. Add another constructor that allows the caller to set the prime number. Also, add a function to get the prime number. Finally, overload the prefix and postfix ++ and -- operators so they return a PrimeNumber object that is the next largest prime number (for ++) and the next smallest prime number (for --). For example, if the object's prime number is set to 13, then invoking ++ should return a PrimeNumber object whose prime number is set to 17, invoking -- should return a PrimeNumber object whose prime number is set to 11.    Please use the following main program to test for the class.  **Input:**  No Input for this Problem, but we will change different main function to test your Code.  **Output:**  According main function output.  **Sample Input / Output：**   |  |  |  | | --- | --- | --- | |  | **Sample Input** | **Sample Output** | | 第一組測資與輸出 | sample.in | Sample.out | | … |  |  | |
| ■易，僅需用到基礎程式設計語法與結構  □中，需用到多項程式設計語法與結構  □難，需用到多項程式結構或較為複雜之資料型態或結構 |
| **Expected solving time:**  15分鐘 |
| **Other notes:**  When PrimeNumber equal to 2, --operator should return 1. In the testing data, PrimeNumber won’t be less than 2. |