

## CPP 程式設計題

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題目名稱(中文/英文)：Class Inheritance

主要測試觀念：class 繼承

### Basics

- ☐ 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

### Functions

- ☐ 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

**題目說明：** Define a class named Document that contains a member variable of type string named text that stores any textual content for the document. Create a method named getText that returns the text field, a way to set this value, and an overloaded assignment operator.

Next, define a class for Email that is derived from Document and includes member variables for the sender, recipient, and title of an email message. Implement appropriate accessor and mutator methods. The body of the email message should be stored in the inherited variable text. Also overload the assignment operator for this class.

Similarly, define a class for File that is derived from Document and includes a member variable for the pathname. Implement appropriate accessor and mutator methods for the pathname and overload the assignment operator.

Finally, create several sample objects of type Email and File in your main method. Test your objects by passing them to the following subroutine that returns true if the object contains the specified keyword in the text property.

```
bool ContainsKeyword(const Document& docObject, string keyword)
{
    if (docObject.getText().find(keyword) != string::npos)
        return true;
    return false;
}
```

For example, you might test to see if an email message contains the text "c++" with the call ContainsKeyword(emailObj, "c++");

**輸入說明：** No Input for this Problem, but we will change different main function to test your Code.

**輸出說明：** Depends on the output of testing main function.

**I/O 範例：**

| Sample Input | Sample Output |
|--------------|---------------|
| main.in      | sample.out    |

**附屬資料：**

☒ 解答程式：document.h, document.cpp, email.h, email.cpp, file.h, file.cpp

☒ 測試資料：main1.cpp, output1.txt, main2.cpp, output2.txt

☒ 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

**解題時間：30 分鐘。**

**其他註記：**

(1) 本題的相關檔案如下(僅供參考)

main.in:

```
int main()
{
    // Create several test objects
    Email email1("Body about programming in C++",
        "Larry", "Curly", "Programming");
    Email email2("Body about running marathons",
        "Speedy", "Gonzales", "races");

    File file1("Contents about some C++ file", "file.txt");
    File file2("Contents about marathon races", "run.txt");

    cout << "Which contains C++?" << endl;
    if (ContainsKeyword(email1, "C++")) cout << " Email1" << endl;
    if (ContainsKeyword(email2, "C++")) cout << " Email2" << endl;
    if (ContainsKeyword(file1, "C++")) cout << " File1" << endl;
    if (ContainsKeyword(file2, "C++")) cout << " File2" << endl;

    // Test our assignment operator
    file2 = file1;
    file2.setPathname("c:");
    cout << "After assignment file2=file1 and file2.setPathname(\"c:\"): "
        << endl;
    cout << "File1's path = " << file1.getPathname() << endl;
    cout << "File2's path = " << file2.getPathname() << endl;

    return 0;
}
```

sample.out:

Which contains C++?

Email1

File1

After assignment file2=file1 and file2.setPathname("c:");

File1's path = file.txt

File2's path = c: