**CPP程式設計題**

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| **Subject：Class Inheritance** |
| **Main testing concept：**class繼承   |  |  | | --- | --- | | **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：**  Please define a class named **Document** that meets the following requirements:   * A *private* member variable **text(string)** to store the internal text of the document. * Two constructors:  **Document():** construct a Document with all member variables being null. **Document(string text):** construct a Document with the member variables having the given values. * Overwrite the operator =, assign the right-valued **Document** to the left-valued **Document**.   Next, define a class **Email** that is derived from **Document**:   * Three *private* member variables: **sender(string)**, **recipient(string)**, and **title(string)** of an email message. * Two constructors:  **Email():** construct an Email with all member variables being null. **Email(string text, string sender, string recipient, string title):** constructs an Email with the member variables having the given values. * Overwrite the operator =, assigns the right-valued **Email** to the left-valued **Email**.   Similarly, define a class **File** that is derived from **Document**:   * A *private* member variable **pathname****(string)**. * Two constructors:  **File ():** construct a File with all member variables being null. **File (string text, string pathname):** constructs a File with the member variables having the given values. * Overwrite the operator =, assigns the right-valued **File** to the left-valued **File**.   \*\* Please implement the getter and setter functions for all private member variables.  **Input:**  No inputs.  \*\*The main() function in your submission will be replaced when judging.  \*\*You can use the main() function in “Other Notes” to test your program.  **Output:**  The result of executing your program with the given main function.  **Sample Input / Output：**   |  |  | | --- | --- | | **Sample Input** | **Sample Output** | | No inputs | Which contains C++?  Email1  File1  After assignment file2=file1 and file2.setPathname("c:"):  File1's path = file.txt  File2's path = c: | |

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| **□ Easy, only basic programming syntax and structure are required.**  **■ Medium, multiple programming grammars and structures are required.**  **□ Hard, need to use multiple program structures or complex data types.** |
| **Expected solving time:**  40 minutes |

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| **Other notes：** #include "Document.h"  #include "Email.h"  #include "File.h"  bool ContainsKeyword(const Document& docObject, string keyword)  {  if (docObject.getText().find(keyword) != string::npos) return true;  return false;  }  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;  } |