

Lab 10

Low Budget Padlocks

Objective

To use classes with private data and public member functions and to use a single constructor.

Assignment

The Low Budget Padlock Company (LBPC) is the world's foremost maker of low-quality, low-security combination locks. Unlike normal combination locks, these Low Budget padlocks only require that a single number be dialed before they can be opened. C++ objects having the following members can represent these locks:

Member Functions (public)

<code>void setCode(int newCode)</code>	Sets <code>actualCombo</code> , the secret code to <code>newCode</code> .
<code>void dialCode(int newGuess)</code>	Sets <code>guessCombo</code> to <code>newGuess</code> on the lock.
<code>bool isOpen()</code>	Returns <code>true</code> if the lock is open and <code>false</code> if it is not.

Data (private)

<code>int actualCombo</code>	The secret code that opens the lock.
<code>int guessCombo</code>	The code that has been dialed on the lock. If <code>guessCombo</code> matches <code>actualCombo</code> , the lock is considered to be open. Otherwise, the lock is closed.

Part I

Define the class `Lock` in a new file called `Lock.h`. The data members should be private so that the codes may only be altered via the interface functions.

Part II

Write a program called `locktest.cpp` which declares a `Lock`-type variable, initializes its secret code to some value, then enters a loop in which it asks the user for a code to dial and states whether the lock is open or not.

Part III

The security provided by this type of lock is not bad, but it is still possible for anyone to change the secret code just by calling the member function `setCode`. We will therefore modify the class `Lock` to make it more secure. Instead of having a function that sets the secret code, write a constructor function that will allow the programmer to specify the code for a `Lock` at the time it is declared. After that time, there should be no way to modify the lock's secret code. Modify your guess-the-code program from Part II to include a separate function and use it to demonstrate the lock's new functionality. You *must* use a constructor. Refer to the Reference for information.

Part IV

The Princeton Padlock Company (PPC) produces slightly more advanced combination locks. Like the locks you're probably familiar with, these provide heightened security in that they require a three-digit code. Modify your class to model Princeton padlocks using a `vector` of `int`'s to store the codes. You'll need to consult the Reference for information on initializing `vector` objects that are members of a class. Again modify your guess-the-code program it include another function to demonstrate the lock's new functionality.