

CFS2160: Programming Stream

Tutorial/Practical 17 and 18

The Abstract

Introduction

Today we will explore abstract classes and interfaces using the Bank Account example.

You should by now have a `BankAccount` class and several sub-classes, and even sub-classes of sub-classes. In all, you should have a `CurrentAccount`, `SavingsAccount`, `StudentAccount`, and a `YoungSaversAccount`. If not, revisit previous weeks, and catch up!

Class Activities

1. After this week's lecture, you should be able to see that `BankAccount` is clearly best implemented as an abstract class. Make the necessary changes and verify that everything still works. If the class has any methods, consider making them abstract too.
2. If you have not already done so, now create a class called `Bank` to contain a collection of `BankAccount` objects. Add a method that returns the total of the Bank's current assets (that is, the sum of the balances of all the accounts.)
3. Add a method to the `Bank` class that will add interest to all accounts that have an interest rate¹, leaving all other accounts unchanged.
4. Suppose that the Bank offers certain account holders "Gold" status. Such account holders are paid a monthly bonus (on top of any interest) and also pay a monthly fee in return for lavish benefits. The fee and payment vary depending on the type of account. This additional feature is available to all types of account. To show how this might work, implement a `GoldCurrentAccount` using an architecture that would allow the creation of other "Gold" accounts.
Hint: Use an interface.

Work to do Outside Class

Now you should be working on the assignment.

This does not mean that you should not be completing these Java practicals, which use features that you should be aiming to use in the assignment.

You are welcome to ask for feedback and advice on the assignment in practical sessions, but we will give preference to those working on the practicals intended for the session.

¹ Hint: That means that they are standard Deposit Accounts, or some special kind of deposit account.