Exercise 3 - Object Oriented Programming

Objective

The objective behind this exercise is to get some familiarity with objects and classes in scala and how we can interact with them. We also look at companion objects and their functionality.

References

Chapter 3: Slides 49 - 67

Overview

1. Start a new worksheet
2. Create a Person class
   * A person has a name, an age and an email address
   * Write a constructor for the class, ensuring that all the variables are private
   * Write some getters and setters for the fields. The age field should not allow someone to decrease their age, you’re not getting any younger!
   * Override the toString method and provide some implementation for it
3. Create some person objects from the class and print out their contents. Change the various values and test if your class is behaving as it should
4. Implement a bank account class
   * A bank account has two constructors
     1. The primary constructor takes an account number and an opening balance
     2. The secondary constructor takes just the account number and sets the balance to zero
   * Add a deposit and withdraw method and a getter for the balance
   * Override the toString method for the class
   * Ensure that you can get the account number. Hint – you can do this without a getter method!
   * The withdraw method should check that the person cannot withdraw more money than they have in their account.
5. Create some bank account objects
6. Create a companion object for your bank account class that stores the next bank account number to use. Remember that you need to place the companion object in the same *file* as the class is declared.

You will need to create some apply methods which will return a new object of type bank account. One of these apply methods should require no parameters and set the account number to the next in the sequence (stored in the companion object) and set the balance to zero.

You may get an error saying, “Wrong forward reference” in your sheet, this happens when there is a reference to something that appears in the worksheet later on. They are read from top to bottom, and so the Person class may not know about the BankAccount companion object at the time it is being created. To fix this change the position of the reference to be before you use it for the first time.

1. Now edit the person object to include a bank account created with the companion object(this bank only allows people to have a single account. When we do collections later we will look at how to have lists of objects).