Homework 4

This is an individual homework assignment. You may receive help from other class mates, but you may NOT copy their work. Copied work will be considered plagiarism and dealt with according to the syllabus and university policy.

Objective: For this assignment, you will demonstrate that you can properly use inheritance, polymorphism, interfaces and explicit type casting to create a complex program solving a basic business need. Your solution is expected to conform to all Java coding conventions and expectations.

Description: Using the various class construction techniques cooperatively to create complex solutions is yet another requirement of contemporary object-oriented programming. Polymorphic object referencing and behaviors are very powerful aspects of OOP that must be understood and mastered. In this assignment, you will create the code for a banking application with two types of accounts (savings and retirement) that have a large number of similarities but a few crucial differences. Use the various construction techniques we have studied to code a solution that implement the capabilities and characteristics as described in the details below. The base class diagram is provided for you below in Figure 1.

Assignment:

- Using the Driver.java class file attached to this assignment in Blackboard, create the code files necessary to implement the class diagram shown below in Figure 1:
  - Works seamlessly with the provided Driver class test harness
    - When executed, the output should be like what is shown below in Table 1
    - ***The Driver.java class file logic is not to be modified***
      - If you wish to add extra credit logic, do so after the existing line 32 in the Driver.java file
  - Most of the required methods are self-explanatory, however, several of them will require you to create proper calculation algorithms (e.g. deposit, withdraw, calculateTax, and calculateInterest)
    - ***Helpful tip:*** Make sure your methods calculate correctly, check your work!
  - Use the following values for the 2 interface constants
    - TAXRATE → 10%
    - INTERESTRATE → 5%

- Upload your .JAVA code file(s) to the appropriate Blackboard assignment

```
***** BASIC POLYMORPHISM *****
Savings account owned by Jeff Hill has a current balance of $125.00
Retirement account owned by Jeff Hill has a current balance of $195.00
***** POLYMORPHISM IN A COLLECTION *****
Savings account owned by Jeff Hill has a current balance of $118.12
Retirement account owned by Jeff Hill has a current balance of $204.75
```

Table 1 – Example Output

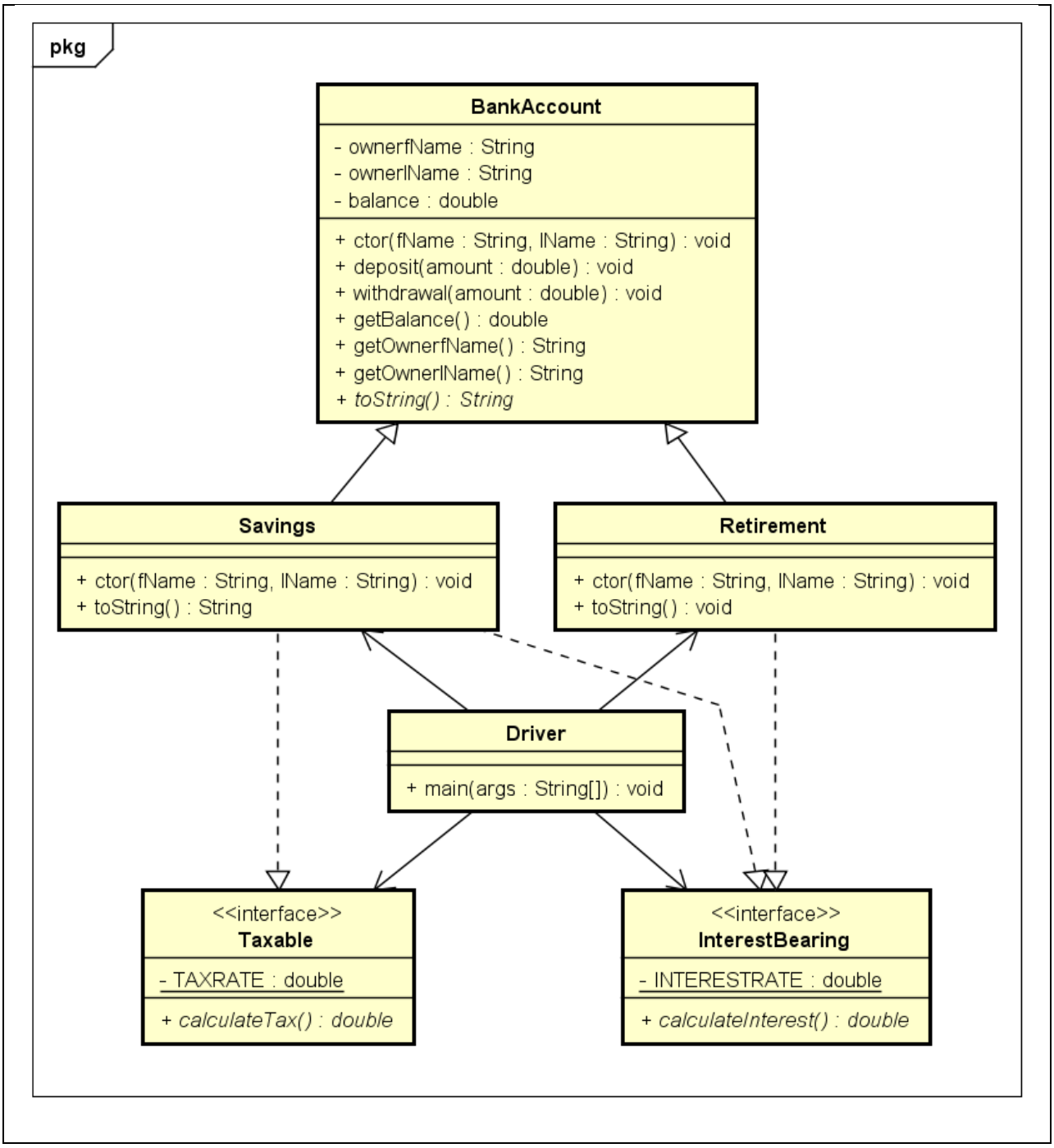

Figure 1 - Class Diagram