# Issaquah High School

# AP Computer Science – Bank Account project

# Due: 2/5/2018

In this assignment, you will be asked to create a few classes to better understand inheritance and polymorphism.

You have been tasked with setting up a bank branch with software to allow it to compute balances on accounts once per month. A program called “Bank” will update (reconcile) all the account balances each month.

**Account Class**

You will create a class called “Account”. This class is the base class for all sorts of bank accounts. It will contain a field for balance and a field for the accountNumber. The accountNumber should be a random 6-digit number between 100000 and 999999. Fields should be private.

Implement all constructors, mutators and accessors needed to support this class. Implement deposit and withdraw methods that update the account balance as appropriate. Implement a toString() method, which will display balance as follows for example:

Checking account: 462925, balance: $87.42

**Savings Account Class**

Create a class called “SavingsAccount”, extending the class “Account”. Include a savingsInterestRate field. When reconciled, the account will earn additional interest money based on the interest rate and the balance when the run took place using the following formula

newBalance = existingBalance + (existingBalance \* interestRate /12)

**Checking Account Class**

Create a class called “CheckingAccount”, extending the class “Account”. Include fields for monthlyFee and minimumBalance.

If the minimumBalance is not maintained at the time the account is reconciled, the monthly fee is subtracted from the monthly balance if the balance is not less than zero.

## Part 1: Base class and two derived classes

You need to provide the three Account type classes. In addition, each class should contain its own main method to be used to run “unit tests” of the code in the class.

## Part 2: Complete program using the three classes from Part 1 [10 points]

Implement the program in a client class “Bank”.

Construct an array of five mixed accounts (Savings or Checking) with different values. See the sample run below.

Reconcile and print the status of each account over a 12 month period. Example output:

Beginning balance

Savings account: 585179, balance: $55.49

Checking account: 984000, balance: $40.80

Checking account: 193702, balance: $2.44

Savings account: 807956, balance: $69.47

Checking account: 302811, balance: $18.56

After month 1

Savings account: 585179, balance: $55.76

Checking account: 984000, balance: $40.80

Checking account: 193702, balance: $0.44

Savings account: 807956, balance: $69.81

Checking account: 302811, balance: $18.56

After month 2

Savings account: 585179, balance: $56.03

Checking account: 984000, balance: $40.80

Checking account: 193702, balance: $0.00

Savings account: 807956, balance: $70.15

Checking account: 302811, balance: $18.56

…. And so on for 9 more months

Note that the output does not have to be fancy. You need to display the account type, the account ID and the balance after the fees have been computed or the interest has been added.

Write another method that prints the total deposits on hand (sum of the accounts) at the end of each month.

## Part 3: Package and submit your code

Include all your java files in on file called Banking.zip. Submit it to Grade-It.