

## 1. The Account class

Design a class named Account that contains:

- A private int data field named id for the account (default 0).
- A private double data field named balance for the account (default 0).
- A private double data field named annualInterestRate that stores the current interest rate (default 0). Assume all accounts have the same interest rate.
- A private Date data field named dateCreated that stores the date when the account was created.
- A no-arg constructor that creates a default account.
- A constructor that creates an account with the specified id and initial balance.
- The accessor and mutator methods for id, balance, and annualInterestRate.
- The accessor method for dateCreated.
- A method named getMonthlyInterestRate() that returns the monthly interest rate.
- A method named getMonthlyInterest() that returns the monthly interest.
- A method named withdraw that withdraws a specified amount from the account.
- A method named deposit that deposits a specified amount to the account.

Implement the class.

(Hint: The method getMonthlyInterest() is to return monthly interest, not the interest rate. Monthly interest is  $\text{balance} * \text{monthlyInterestRate}$ .  $\text{monthlyInterestRate}$  is  $\text{annualInterestRate} / 12$ . Note that annualInterestRate is a percentage, e.g., like 4.5%. You need to divide it by 100.)

Write a test program that creates an Account object with an account ID of 1122, a balance of \$20,000, and an annual interest rate of 4.5%. Use the withdraw method to withdraw \$2,500, use the deposit method to deposit \$3,000, and print the balance, the monthly interest, and the date when this account was created.

## 2. ATM machine

Use the Account class created to simulate an ATM machine.

Create ten accounts in an array with id 0, 1, . . . , 9, and initial balance \$100.

The system prompts the user to enter an id. If the id is entered incorrectly, ask the user to enter a correct id. Once an id is accepted, the main menu is displayed as shown in the sample run. You can enter a choice 1 for viewing the current balance, 2 for withdrawing money, 3 for depositing money, and 4 for exiting the main menu. Once you exit, the system will prompt for an id again. Thus, once the system starts, it will not stop.

Enter an id: 4

Main menu

1: check balance

2: withdraw

3: deposit

4: exit

Enter a choice: 1

The balance is 100.0

Main menu

1: check balance

2: withdraw

3: deposit

4: exit

Enter a choice: 2

Enter an amount to withdraw: 3

Main menu

1: check balance

2: withdraw

3: deposit

4: exit

Enter a choice: 1

The balance is 97.0

Main menu

1: check balance

2: withdraw

3: deposit

4: exit

Enter a choice: 3

Enter an amount to deposit: 10

Main menu

1: check balance

2: withdraw

3: deposit

4: exit

Enter a choice: 1

The balance is 107.0

Main menu

1: check balance

2: withdraw

3: deposit

4: exit

Enter a choice: 4

Enter an id: