Homework 2

Date Due: Sunday, September 27, 2:00 pm

To install: cs015_install hw2
To hand in: cs015_handin hw2

New Concepts Covered:

- Reassigning variables
- Instance variables vs. local variables
- Association vs. containment
- Packages
- Inheritance

Getting Started

Install by typing cs015_install hw2 into the Terminal. This will create a directory in /home/<your login>/course/cs015/hw2/. This is where you'll need to put the PDF with your answers. Please include your Banner ID at the top of the PDF, but not your name or login, as we grade anonymously.

CS15 Initial Student Questionnaire

Please take a few minutes to fill out our initial student survey at: https://docs.google.com/a/brown.edu/forms/d/1-p1aQH0q9J8jc91IQUICo54Z9cvYrR6CB4n_6xDBKM/viewform. This information will help us tailor the course to your needs.

Assignment Specifications:

Please answer the following questions:

1. For the following questions, refer to the following code:

    ```java
    public class IntegerHolder {
        private int _a;
        private int _b;
    }
    ```
public IntegerHolder() {
    int a = 1;
    int b = 2;
    int c = 3;

    _a = a;
    _b = b;
    b = c;
    a = b;
    c = a;

    System.out.println("Printline 1:");
    System.out.println(a + b);
    System.out.println("Printline 2:");
    System.out.println(b - c);
    System.out.println("Printline 3:");
    System.out.println(_a);
    System.out.println("Printline 4:");
    System.out.println(_b);
    this.update();
}

public void update() {
    int temp = _b;
    _b = _a;
    _a = temp;
}

a. What is the difference between an instance variable and a local variable? Give an example of each type from IntegerHolder.

b. What will be printed after "Printline 1:"?

c. What will be printed after "Printline 2:"?

d. What will be printed after "Printline 3:"?

e. What will be printed after "Printline 4:"?

f. What are the final values of _a and _b?

2. In the CasinoGame class that follows, which of the instance variables are contained (instantiated) within CasinoGame, and which of the instance variables are associated
3. The following questions have to do with packages.
   a. What is a package in Java?
   b. When is it better to import a package vs. explicitly reference the package with its path name?

4. Refer to the following code to answer these questions:
   public class Phone {
       private int _phoneNumber;

       public Phone(int phoneNumber) {
           _phoneNumber = phoneNumber;
       }

       public int getPhoneNumber() {
           return _phoneNumber;
       }

       public void call(int numberToCall) {
           /* implementation elided */
       }
   }
a. Examine Student's `callNumber` method. Will it work? If not, explain why. If so, is the `call` method that is run written in the `Phone` or the `SmartPhone` class?

b. Examine Student's `getMyNumber` method. Will it work? If not, explain why. If so, is the `getPhoneNumber` method that is run written in the `Phone` or the
SmartPhone class?

c. Examine Student’s `listenToMusic` method. Will it work? If not, explain why. If so, is the `playMusic` method that is run written in the Phone or the SmartPhone class?

d. Imagine that the following line of code is a part of the SmartPhone class’s `call` method:

   ```java
   int num = _phoneNumber;
   ```

   Will this code work as expected? If not, explain why.

e. Imagine that the following line of code is a part of the SmartPhone class’s `playMusic` method:

   ```java
   _os.playMusic();
   ```

   Assuming the OS class has a `playMusic` method, will this code work as expected? If not, explain why.

Handin Information

This assignment must be submitted no later than **2:00 pm on Sunday, September 27th**. There is **no** late handin for this assignment. You will submit this electronically! Remember to create a single PDF from your answers and place them in the correct directory (`/home/<your login>/course/cs015/hw2`). Then you can run `cs015_handin hw2` to submit. Remember to include your Banner ID (but not your name or login). When you have successfully handed in the assignment, a confirmation email will be sent to your CS department account (<yourlogin>@cs.brown.edu).