Lab 03: Input Output
CSE-020-01, Fall 2019 **Points: 20**

Overview

In this lab we will be learning to use Input methods - ways of asking the user of the program to enter more or new information which can then be utilized in a program. In order to make Input most useful, we also need to store them for later use. This leads us to use variables to store the inputs, where each variable has an identifier (a name that we assign) and a data type.

Use of Scanners

We will use a newer utility provided by Java called Scanner to give us ability to read user input from the keyboard. To do this, we need two pieces of code to enable us access to the Scanner class and subsequently the keyboard inputs.

```
import java.util.Scanner;                  // at top of the file
Scanner input = new Scanner(System.in);    // declaration of a Scanner object
                                           // associated with the keyboard
                                           // (System.in) inside main()
```

This allows the use of the Scanner object called `input` to gather data from the keyboard with different calls for each data type as shown below:

```
input.nextInt();              // gets the next integer number
input.nextFloat();            // gets the next floating point number
input.nextLine();             // gets the next string line
```

Getting Started

After starting Eclipse create a new project named **Lab20_3**. Download the file `Averages.java` from the Lab 03 assignment page in CatCourses into a convenient location, like your **Desktop**, and import this file into the Lab20_3 project you just created. You will see the following features in this new program:

- The `import` line at the top of the file
- A Scanner object called `input` created inside `main()`
- Declaration of variables: `n1` and `n2`
- Pairs of `println` and `nextInt` calls (to prompt user and gather data)
- Data saved into `n1` and `n2`
- Use of saved data to calculate value of a new variable called `average`
- Output the result to the user

Run this program with various inputs and observe the program behavior.

Part 1: Finding and Fixing Errors

We call the process of finding and fixing errors **debugging**. You will be introduced to it in this lab. Download the files `Errors1.java`, `Errors2.java` and `Errors3.java` from the Lab 03 assignment page, and import them into the Lab20_3 project. Obviously, they don't run as is, or produce the correct output. Your job is to find the correct behavior based on what you learned from `Averages.java`. Your changes should follow the convention below:

```
/* I figured all this out and made it all work.
   These comments are optional */

System.out.println("This is corrected statement");
// System.out.println("This is old erroneous statement);
```

You'll turn erroneous lines of code inside the files into comments (required) and then have the corrected line precede the commented lines, as shown above. You're free to add more comments as notes to yourself to explain the nature of the error(s) you fixed. This way it'll be easy to recall the changes you made when the TA asks you demonstration, or when you subsequently review this lab. Your exams can have similar questions in the vein of these exercises so get comfortable with them. Remember Java is case sensitive.

Part 2: (Assessment) Logic Check

Create a Word document or text file named `Part2` that contains answers to the following:

1. How many types of errors did you encounter?
2. How do you know when you have found all the errors (or bugs)?
3. Is naming convention important to avoid errors?

Part 3: Interviewer Program

Create a new class called `Interviewer` in the Lab20_3 project. You will use the 5 questions or more from Lab 02 to create this. It will ask the user the questions one by one to gather information about them. Make sure at least one question requires an integer as an answer (for eg., the year they joined UC Merced). You will also need to know how to create String objects. One example is given below:

```
String name;
System.out.print("What is your name? ");
name = input.next();
// remaining inputs will go here

System.out.println();   // gap between input and output

System.out.print("Their name is ");
System.out.println(name);
// remaining outputs will go here
```

What to hand in

When you are done with this lab assignment, submit all your work through CatCourses.

Before you submit, make sure you have done the following:

- Attached the file named `Part2` containing answers to the assessment questions.
- Attached the fixed up `Errors1.java`, `Errors2.java` and `Errors3.java` files.
- Attached your new `Interviewer.java` file.
- Filled in your collaborator's name (if any) in the "Comments…" text-box at the submission page.

Also, remember to demonstrate your code to the TA or instructor before the end of the grace period.