CS161: Introduction to Computer Science
Lab Assignment 3

Today's lab is meant to give you practice using the dot operator to invoke methods on objects of type `Scanner`, `String`, and `Random`.

I highly encourage you to explore the Java API webpages for these classes – e.g. if there is a method that you're not familiar with or you want to know what methods are available for you to call. You can get to the Java API pages via the course webpage (see "Resources") or by googling "Java" and the class name.

Note: This lab has starter code.

Warm Up

The program below reads inputs from the keyboard, then prints some outputs based on those values. Take a moment to read through the program, then predict what its outputs will be for the inputs shown below.

```java
public class ScannerCode {
    public static void main(String[] args) {
        Scanner scan;
        scan = new Scanner(System.in);

        // what's the difference between next(), nextInt(), and nextLine()?
        String first = scan.next();
        int num = scan.nextInt();
        String last = scan.nextLine();


        System.out.println("Line 1: " + first.substring(2,4));
        System.out.println("Line 2: " + first.replace('e','E'));
        System.out.println("Line 3: " + first);
        System.out.println("Line 4: " + first.substring(num));
        System.out.println("Line 5: " + last.toUpperCase());
    }
}
```

What will the program print for the following inputs? The starter code contains the `ScannerCode` class. Use this to check your answers.

1. `Eeyore 2 527`

2. `Eeyore 5 is my favorite`

3. `Oscar 0`

4. `I like Java`

⎯⎯⎯⎯ String Manipulation (choose one) ⎯⎯⎯⎯

The following are puzzles involving strings. The goal is to convert one string into another using methods from the `String` class. Create a Java class named `StringPuzzle` and inside write code to solve *only one* of the following:

1. `String phrase = new String("fade into Bolivian");`

Convert this into the string: "fade into oblivion"

2. `String phrase = new String("don't cry for me Marge and Tina");`

Convert this into the string: "don't cry for me Argentina"

3. `String phrase = new String("The duality of a book can jar thine reasoning");`

Convert this into the string: "The quality of a cook can mar the seasoning"

Feel free to browse through the Java API webpage for the `String` class and use any methods you think would be useful.

⎯⎯⎯⎯ Department of Motor Vehicles ⎯⎯⎯⎯

The Department of Motor Vehicles (DMV) is responsible for issuing driver's licenses. This question asks you to write a Java class called `DMV` that prompts the user to enter their full name (first, middle, and last) and their date of birth and then produces a "driver's license". The license should have the following pieces of information:

- A driver's license number that consists of the first 5 characters of the last name plus 4 random digits.

- The user's last name

- The user's first and middle name

- The user's date of birth

- An expiration date which is the user's birth date except for the year which should be 2020.

The first letter of the first, middle, and last name should always be capitalized (and the other letters lower cased). The next page shows an example of what my program produces when run:

```
Welcome to the DMV (estimated wait time is 4 hours)

Please enter your first, middle, and last name:
Sarah Anne Stretch

Enter date of birth (MM/DD/YY):
05/18/70


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Washington Driver License
LIC# Stret8572

LN Stretch
FN Sarah Anne
DOB 05/18/70
EXP 05/18/20
-------------------------------------
```

Notice that my program prints an estimated wait time which (in California where I'm from) is always a random number between 3 and 10 hours!

There is a useful method in the string class called `lastIndexOf(char ch)` that returns the last index of the specified character in the string.

Submitting your lab assignment

Depending on how far you got in lab today, your `lab3` folder will have a `ScannerCode` class, a `StringPuzzle` class, and a `DMV` class.

Rename your `lab3` folder using both people's first and last names. For example,

<div align="center">

`lab3_John_Doe_Jane_Doe`

</div>

Please rename your folder *before* you zip it.