CS161: Introduction to Computer Science
Homework Assignment 4
due 2/22 by 11:59pm

The purpose of this homework assignment is to give you practice creating and using objects of type `Scanner`, `String`, and `Random`. Recall that these Java classes were written by some other programmer for your use.

Creating objects in Java requires you to use the `new` keyword. Once an object is created, you can call (or invoke) a method on the object by using the dot operator. The most important thing to remember when creating and using objects is that all of your *types* need to match!

Generating Usernames and Passwords

Now that we know about the `Scanner` class, we can finally write interactive programs! This week we'll mix some input with some string processing, toss in a bit of randomness, and produce a program that generates faux user names and suggested passwords for users.

Your program should prompt the user for three pieces of information: their first name, last name, and favorite word. You'll then use those pieces of information to help generate something that could be used as a unique user name, as well as three suggested passwords, each constructed using different rules. A sample interaction is shown below:

```
Welcome to the username and password generator!
Please enter your first name:  Ron
Please enter your last name:  Thomas
Please enter your favorite word:  Literature

Thanks Ron, your user name is rthomas84

Here are three possible passwords:

Password 1:  r0n39th0m@$
Password 2:  rNtSlE
Password 3:  RonLiteraTh
```

Programming Questions

All of your code should be inside of a class named `Passwords`. Be sure to break up your code into smaller methods that you can call from `main()`.

1. The username generated by your program should consist of:

- the first letter from the user's first name
- followed by their last name
- followed by a random integer between 0 and 99

The letters in the username should all be lower case. For full credit, *your solution should build a single string containing all of these characters and then print it, rather than just printing each piece separately.* You should also be polite and personalize the response by including the user's first name, as shown above.

2. The first password should consist of:

- the user's first name
- a random integer between 0 and 99
- the user's last name

Again, the letters in the password should all be lower case. Once you construct the password, some of the characters can then be replaced by similar looking digits and punctuation characters. You should perform the following replacements, though you can feel free to add some more of your own: 'a' by '@', 'o' by '0', 'l' by '1', and 's' by '$'.

3. The second password is an "acronym" consisting of:

   - the first and last characters from the user's *first* name
   - the first and last characters from the user's *last* name
   - the first and last characters from the user's favorite word

   In each case, the first character of the pair should be lower case and the second should be upper case.

4. Finally, the third password consists of:

   - a random-length portion of the first name
   - a random-length portion of the favorite word
   - a random-length portion of the last name

   In each case, those random-length pieces should start at the beginning of the string, and the code should be written such that it's possible to get the entire string if the largest possible random number is produced.

Style Guide

Before you submit your assignment, double check the following:

- You have a Javadoc comment at the top of the class with a brief description (written in full English sentences), you and your partner's name, and the date.
- All variable names are lower cased (remember, only classes are capitalized in Java)
- Use inline comments (`//`) to explain any complicated code

Extras

Looking for additional challenges? Feel free to invent some additional username or password formats and implement them in addition to the required ones.

For example, instead of taking random-length portions of the inputs that always start at the beginning of the input strings, take substrings where both the starting and ending points are random. You could also ask for an additional input (e.g. the user's favorite number) and use that in interesting ways.

Submitting your assignment

Please make sure to rename your folder before zipping. You should rename your folder using both of your first and last names. For example, `hw4_John_Doe_Jane_Doe`.

Submit your zipped folder via Moodle.