Unit 2: Using Objects

Topic 7 Lab 2: String Engineering!

Name:	

Time to kick it up a notch and do some "string engineering"!

1. Open up your U2T7 Partner Challenge Replit.
2. Work with your partner to add the six additional methods described below. These get a little crazy and brain busting! You will need to have open the Java API for the String class to write the `yellOrWhisper` method.
3. Test each method using the test cases posted in a separate document in Google Classroom. As software engineers, you will be writing some pretty challenging code and will need to thoroughly test all parts of your code with *many* test cases!

`/* BELOW ARE THE 6 NEW METHODS TO ADD TO YOUR CustomStringMethods CLASS! */`

```
/**Client provides two strings, str1 and str2, and method prints a message to the user that states
   whether str1 comes before str2, comes after, or they are the same alphabetically.
   This method has no return value (void).

   Example: if str1 is "apple" and str2 is "banana", this method should print a message like:
   "apple comes BEFORE banana alphabetically"
   Example: if str1 is "banana" and str2 is "apple", this method should print a message like:
   "banana comes AFTER apple alphabetically"
   Example: if str1 and str2 are both "apple", this method should print a message like:
   "apple and banana are the SAME string!"
*/
public void alphabetical(String str1, String str2) {

}

/**Client provides myString and the method returns a String that represents mystring
   with its halves reversed; for example, for the string: "reverse me!" the method would
   return "e me!revers"; strings of odd length should have the extra character be a part
   of the second half when initially halved (and appear in the first half in the returned String).
*/
public String halvesReversed(String myString) {

}

//      The method below will require the use of String methods toLowerCase() and toUpperCase,
//       neither of which are required on the AP Exam but both are very useful Java methods to know.
//       Look them up in the Java API docs to see how they work!

/**Client provides myString and this method should return a String with all characters in myString
   in uppercase if the first letter of myString is an uppercase letter. If the first letter of myString is a
   lowercase letter, this method should return a String with all characters in myString in lowercase.
   You can assume myString will always begin with a letter (and not a number or some other character).
```

Example: If `myString` is `"Hello James!"`, this method returns the `String "HELLO JAMES!"` because the first letter of `myString` , "H", is an uppercase letter.
Example: If `myString` is `"hello James!"`, this method returns the `String "hello james!"` because the first letter of `myString`, "h", is a lowercase letter.

```
*/
public String yellOrWhisper(String myString) {

}
```

/**Client provides `myString` and the method returns a new `String` with the last `numToCap` characters in uppercase, if not already; if `myString` has less than `numToCap` characters, uppercase the entire `String`. *Any punctuation marks at the end should count towards* `numToCap`.

Example: If `myString` is `"hello"` and `numToCap` is 3, this method returns the `String "heLLO"`
Example: If `myString` is `"hello"` and `numToCap` is 6, this method returns the `String "HELLO"`
Example: If `myString` is `"Gigantic"` and `numToCap` is 3, this method returns the `String "GiganTIC"`
Example: If `myString` is `"Gigantic!!"` and `numToCap` is 3, this method returns the `String "GigantiC!!"`

```
*/
public String endUp(String myString, int numToCap){

}
```

/**Client provides `myString` and `removeIdx` and method returns a new `String` with the character located at `removeIdx` in `myString` removed. If `removeIdx` is outside the bounds of `myString`, the method should return `myString` unchanged.

Example: If `myString` is `"Halloween"` and `removeIdx` is 5, this method should the `String "Halloeen"`
Example: If `myString` is `"Halloween"` and `removeIdx` is 0, this method should the `String "alloween"`
Example: If `myString` is `"Halloween"` and `removeIdx` is 9 (outside the bounds of `myString`), this method should return the `String "Halloween"` (the original `myString` unchanged).

```
 */
public String removeCharacter(String myString, int removeIdx) {

}
```

/**Client provides `orig`, `insertText`, and `searchStr`, and the method returns a new `String` where `insertText` has been inserted into `orig` starting *at* the index where `searchStr` is *first* found in `orig`, "pushing" all characters that come after `insertIdx` in `orig` *behind* `insertText`.
In the event `insertText` is not found in `orig`, append `insertText` onto the end of `orig` and return that String.

Example: If `myString` is `"ghost"`, `insertText` is `"BOO!"`, and `searchStr` is `"o"`, this method would return the `String "ghBOO!ost"` (since in `orig`, `searchStr` is found at index 2).
Example: If `myString` is `"ghost"`, `insertText` is `"BOO!"`, and `searchStr` is `"st"`, this method would return the `String "ghoBOO!st"` (since in `orig`, `searchStr` is found at index 3).
Example: If `myString` is `"ghost"`, `insertText` is `"BOO!"`, and `searchStr` is `"m"`,

```
        this method would return the String "ghostBOO!" (since searchStr is not found in orig).
  */
  public String insertAt(String orig, String insertText, String searchStr) {

  }
}
```

TESTING! Test cases for all 6 methods have been provided in a separate Google Doc posted in Google Classroom (or open it here)

Copy/paste your code below for your 6 (fully tested!) new methods:

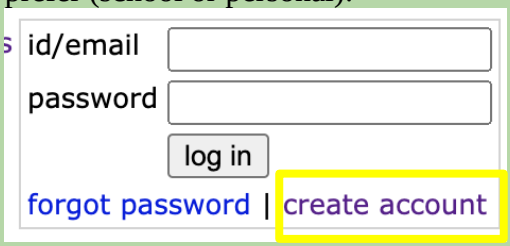
Sample solutions will be posted later during class.

Lab continues on the next page!

Coding Bat!

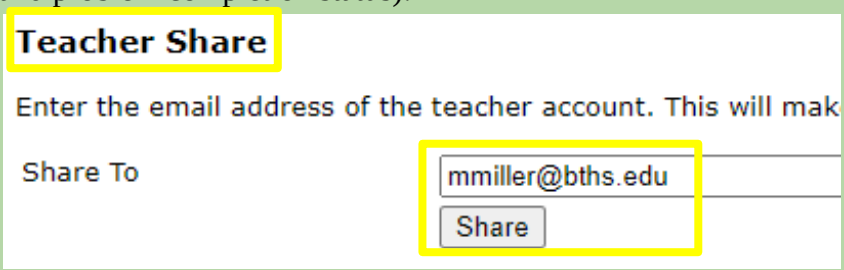
For these last problems, you will use **CodingBat Java** to develop and test your methods, since it has a lot of *built-in* testing for you for each problem. *If you do not already have a CodingBat account*, create one first (use your preferred email) so your progress gets saved. If you already have an account, log in.

A. Go to **CodingBat** and create an account (or log in if you already have an account); use any email you prefer (school or personal):

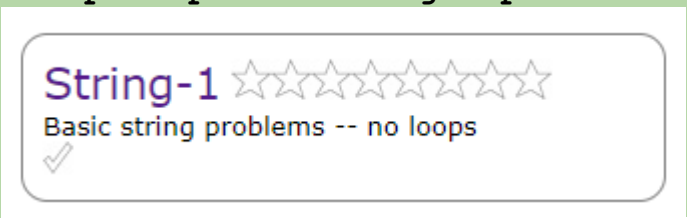


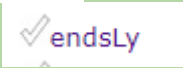
B. **Login**, then go to **prefs**:

C. Under **Teacher Share**, enter **mmiller@bths.edu**, then click **share** (this will allow Mr. Miller to see your progress and problem completion status):



1. Open up the String-1 problems:



2. Find the endsLy problem: 

Read the problem, then write and test your method on CodingBat's website.

Click "Go" to perform automated testing of your method: 

You have a fully valid solution when ALL AUTOMATED TESTS PASS!

Expected	Run		
endsLy("oddly") → true	true	OK	
endsLy("y") → false	false	OK	
endsLy("oddy") → false	false	OK	
endsLy("oddl") → false	false	OK	
endsLy("olydd") → false	false	OK	
endsLy("ly") → true	true	OK	
endsLy("") → false	false	OK	
endsLy("falsey") → false	false	OK	
endsLy("evenly") → true	true	OK	
other tests		OK	

All Correct

Copy and paste your method code that passes ***all*** CodingBat tests:

```
public boolean endsLy(String str) {

}
```

3. Find and solve the conCat problem:

conCat

Copy and paste your method code that passes ***all*** CodingBat tests:

```
public String conCat(String a, String b) {

}
```

You should notice that you now have these two solved:

theEnd	withouEnd2	middleTwo
endsLy	nTwice	twoChar
middleThree	hasBad	atFirst
lastChars	conCat	lastTwo
seeColor	frontAgain	minCat
extraFront	without2	deFront

4. Find and solve one other string problem of your choosing!

Which problem did you choose?	

Copy and paste your method code that passes ***all*** CodingBat tests:

Want to see sample solutions for endsLy and conCat? [click here]

Done!
Submit in Google Classroom:

Turn in

Sample solutions (back)

endsLy

```
public boolean endsLy(String str) {
  int length = str.length();
  if (length < 2) {
    return false; // if we get here, immediately return; no code below executes
  }

  String lastTwo = str.substring(length - 2); // get last two characters
  if (lastTwo.equals("ly")) {
    return true;
  } else {
    return false;
  }
}
```

conCat

```
public String conCat(String a, String b) {
  if (a.length() == 0) {
    return b;  // return immediately; no other code below executes
  }

  if (b.length() == 0) {
    return a; // return immediately; no other code below executes
  }

  String lastLetterA = a.substring(a.length() - 1);
  String firstLetterB = b.substring(0, 1);

  if (lastLetterA.equals(firstLetterB)) {
    String bWithoutFirstLetter = b.substring(1);
    return a + bWithoutFirstLetter;
  } else {
    return a + b;
  }
}
```