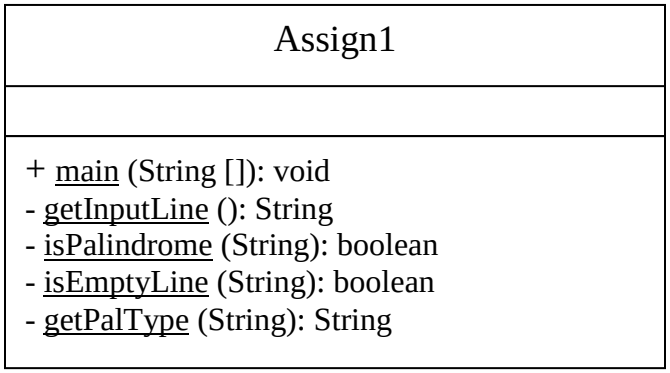
CSE205 Summer 2017 Assignment 1
Due May 23 11:59PM, late May24 11:59PM

This is a simple review assignment and should be able to be completed easily. Be sure to follow all style and documentation requirements for **THIS** class. You will be penalized for not following these requirements.

In this assignment, you are to determine if an input string is a palindrome and, if it is, what type of palindrome. A palindrome for this assignment is defined as "a number, word or phrase consisting of alphanumeric characters that reads the same frontwards and backwards while ignoring case, punctuation and white space".

For this assignment, create a package named assign1 and name your file Assign1.java.

UML Class Diagram



Notes on the UML Class Diagram

- There is only one class, Assign1.
- Underlining the name of the variable/method in a UML class diagram indicates that the variable or method is static. This means that all methods are static.
- There are no class level variables.
- The main is public while the other methods are private.

Limitations on Java Classes

For this assignment, you are limited to the following Java library classes.

1. Scanner
2. String
3. Character

Required main function: Here is the main method. Copy this into your code and do not change it.

```
public static void main (String [] args) {

    String line = getInputLine();
    while (!isEmptyLine (line)) {
        if (isPalindrome (line))
            System.out.println ("\"" + line +
                "\" is a palindrome and a " + getPalType (line));
        else
            System.out.println ("\"" + line + "\" is not a palindrome");
        line = getInputLine();

    }
    System.out.println ("End of program");
}
```

Required methods: You must write the following methods as specified to complete your program. Pay attention to the name, return type and parameters.

`public static String getInputLine ( )`
Prompt the user to input a line of input and then read and return the line.

`public static boolean isEmptyLine(String str)`
Return true if the parameter is empty or false otherwise.

`public static boolean isPalindrome (String str)`
Return true if the string is a palindrome or false otherwise. See the pseudo-code on the next page for the logic and the restrictions on this implementation.

`public static String getPalType (String str)`
Determine the type of the palindrome and return "word", "phrase", or "number".
The definition is

- number: only digits with white space and/or punctuation
- word: only alphabetic with no white space and/or punctuations
- phrase: anything else.

isPalindrome pseudo-code

Note: in the following, the symbol ← represents assignment 12321 1Ab1

left ← 0 0
right ← position of last character in string right 4 3
okay ← true okay true true
while okay and left < right
    ch1 ← character in the string at position (left) ch1 1
    if ch1 is not a digit or letter
        increment left
    else
        ch2 ← character in the string at position (right) ch2 1

```
        if ch2 is not a digit or letter
            decrement right
        else
            convert both ch1 and ch2 to upper case
            if ch1 = ch2
                increment left
                decrement right
            else
                okay ← false
            endif
        endif
    endif
end while
return okay
```

Coding Restrictions

1. You may NOT return from or break from the inside of a loop.
2. You may NOT copy the String to another String.
3. You must STOP processing as early as possible (when you find that it is or is not a palindrome).

Submitting

Using the link on Blackboard, submit your Assign1.java file for grading. It will be downloaded, compiled and graded as well as checked against the online utility to check for plagiarism and similarity to other students' work.

Sample input and output

```
Enter a line of input: This is a test
"This is a test" is not a palindrome

Enter a line of input: 12345.4321
"12345.4321" is a palindrome and a number.

Enter a line of input: Otto!
"Otto!" is a palindrome and a phrase.

Enter a line of input: Able was I, ere I saw Elba.
"Able was I, ere I saw Elba." is a palindrome and a phrase.

Enter a line of input: Abba
"Abba" is a palindrome and a word.

Enter a line of input:
Program complete
```