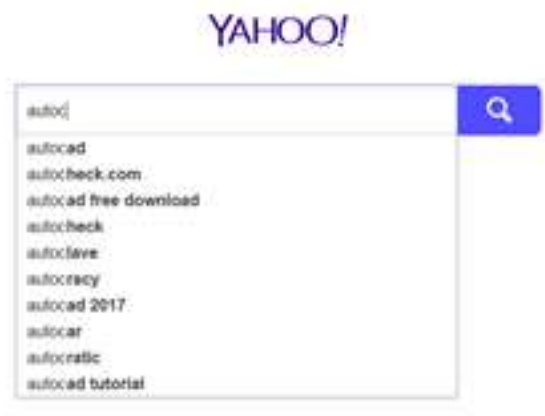
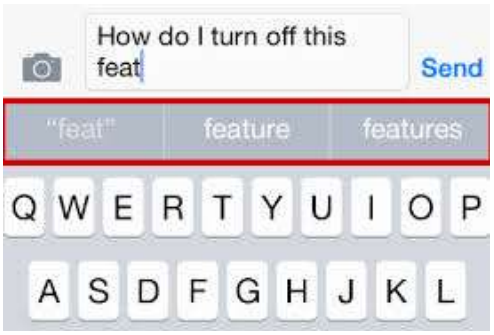
CSC 300 Sections 402, 411, 701, 710 Fall 2017
Homework assignment 4
Due: as specified on D2L

The task

Your task for this assignment is to complete a Java program that simulates the **autocomplete** feature that is found on many Web sites and computing devices (such as cell phones). Autocomplete is a feature in which an application predicts the most likely completion(s) of a word or phrase as a user begins to type it. Autocomplete usually runs in real-time, and therefore efficiency is essential.

The first screenshot below show Yahoo's autocomplete feature at work. I have just typed "autoc". The second screenshot shows the autocomplete feature on a typical cell phone.





For this assignment, your autocomplete program should work as follows:

1. The user types the beginning of a word (or perhaps a whole word)
2. The program prints the three most likely completions of what the user typed

For example:

```
Type part of a word.  Type 'q' to stop
am
am among amount
Type part of a word.  Type 'q' to stop
ar
are around arms
Type part of a word.  Type 'q' to stop
mys
myself mysterious mystery
Type part of a word.  Type 'q' to stop
auto
automobile automatic
```

I have provided you with starter code for this assignment. First, here is the main class:

```
public class HW4Main {
	public static void main(String[ ] args)  {
		Wiktionary wik = new Wiktionary("wiktionary.txt");
		while (true) {
			Scanner console = new Scanner(System.in);
			System.out.println("Type part of a word.  Type 'q' to stop");
			String prefix = console.next();
			String best = wik.bestMatches(prefix, 3);
			System.out.println(best);
		}
	}
}
```

The **wiktionary.txt** file that I've provided contains data about the 10,000 most frequently used words in the English language. Each line of the file consists of an integer (actually, a **long** in Java), and a word. The number reflects the word's frequency of use, with higher numbers indicating words that are used more frequently. As you can see from the file, "the" is the most frequently used English word. The 10,000th most frequently used word, according to this file, is "calves". Data is not provided for words that are used less frequently than "calves".

I have also provided starter code for a **Wiktionary** class. This class has the following public methods:

- A constructor, which is passed the name of a text file containing information about word usage. I have already written this.
- A method called **bestNMatches**. This method is passed a String called "prefix", and an integer n. should return an array of Strings (words). The strings should be the possible completions of the prefix, ordered by their frequency of use.

I have also provided skeletons for two private "static" methods, called **wordComparator** and **countComparator**. These methods should return Comparator objects (i.e., objects which implement the Comparator interface. The first should be used to order items alphabetically, and the second to order items by their frequencies of use.