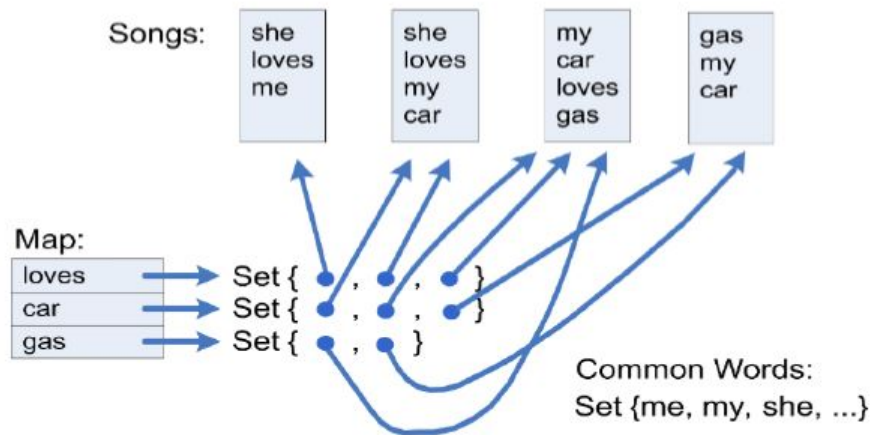*TreeMaps and TreeSets*

Objectives: Using set operations.

In part 7 you built a map of words to sets of Songs containing those words. In part 8 you are going use this map to quickly find all the songs containing a group of words by intersecting the sets for the individual words. For example in the diagram above, to find all the songs containing both the word "loves" and "car", intersect the set of songs containing the word "loves" with the set of songs containing the word "car". This would result in a set containing just the middle 2 songs above.

Task 1:Search

- Implement the method public Song[] search(String lyricsWords) whose argument is a string containing lyrics words.

- The search terms should be processed in the same way as the lyrics were processed: ignore common words, ignore punctuation and single letters, and convert all words to lowercase. For example if the user searched for "We don't need no education", this should be broken into the terms: "we", "don", "t", "need", "no" and "education". Of those terms "t" should be ignored because it is a single letter, and "we" and "no" should be ignored because they are in the set of common words. The reduction of "don't" into "don" may seem inaccurate because we have thrown out the 't part. However because we did the same to the lyrics, we will still find any matches, although we may sweep up a few extra songs about Mafia dons or people named Don. Note that Google often gives you some matches that don't seem relevant either.

- Use the TreeSet's Set operations.

Task 2: Testing

- In main(), add testing of your search class using command line arguments similar to those in the previous assignments. The first command line argument is the name of

the song file, and the second argument is now a string of lyric words. In NetBeans, to pass in more than one word as a single command line argument you will need to enclose the sting of lyrics words in quotes.

- Your testing routine should print out the total number of matches, and the artist and title for the first 10 matches.

- Run these test cases and show the results in your report:
  "We don't need no education"   should find 4
  "she loves my car"   should find 4
  "blue jeans"   should find 19
  "little"   should find 1675
  "notaword"   should find 0

Task 3:Works with the GUI

- Check that this new search works with the GUI.

What to turn in:

Written part:

1. Turn in your search results from Task 2. Copy and paste from the console to a document.

2. Any incomplete parts, or any known bugs in your code.

Electronic submission:

- Submit and your write up part8.pdf file.
- SearchByLyricsWords.java
- Do not in any way combine, compress, zip, tar or jar your files!

Grading:
search by lyrics words	80 points
results from task 2	10 points
works with the GUI	10 points

I expect your programs to be properly commented and use good style. Points may be deducted for egregious disregard of these matters. Every method in every class must have complete documentation including authorship. A full an complete revision history should be at the top of every class file!