Binary Search - Zipcodes again

CS 206 - Introduction to Data Structures

Assignment 5 - due Thursday 3/21

Rewrite your Assignment 2 to use more efficient searching techniques. Specifically, the zipcodes in `uszipcodes.csv` are already listed in lexicographic order and thus the ArrayList will naturally be sorted by zipcodes after you are done reading this file - verify that it is so.

1. Modify the `lookupZip` method to use binary search instead. You must implement a binary search from scratch and you are not allowed to use Java's built-in `Collections.binarySearch`. Note also that object comparisons should be done via `compareTo`.

2. If you didn't call `lookupZip` when you were weaving in the data from `ziplocs.csv`, you should rewrite that other lookup method to use your binary search too.

3. The rest of the restrictions and requirements for Assignment 2 remain.

4. Time your new implementation using commandline redirection of the following test file: `~dxu/handouts/cs206/tests/a2/in.txt`. That is, issue the following command at the prompt:
   `time java Main < ~dxu/handouts/cs206/tests/a2/in.txt > out.txt`
   Compare the result with your Assignment 2 implementation. Is there a speedup? Report your findings in your README.

Electronic Submissions

1. README: The usual plain text file `README`

Your name:

How to compile: Leave empty if it's just `javac Main.java`

How to run it: Leave empty if it's just `java Main`

Known Bugs and Limitations: List any known bugs, deficiencies, or limitations with respect to the project specifications. Documented bugs will receive less deduction versus uncaught ones.

Discussion: As explained above in 4.

2. **Source files:** `Main.java Place.java LocatedPlace.java PopulatedPlace.java LookUpZip.java`

3. **Data files used:** `uszipcodes.csv ziplocs.csv`

DO NOT INCLUDE: Please delete all executable bytecode (`.class`) files prior to submission.

To submit, store everything (README, source files and data files) in a directory called `A5`. Then follow the directions here:
`https://systems.cs.brynmawr.edu/Submit_assignments`