COMP 282 Project 4: RandomAccessFile (30 points)

Due: December 15 at 23:55

Idea: As discussed in class, you'll be using external hashing to show the ability to insert and find items in a RandomAccessFile.

Requirements: I'd suggest having a class called Item which consists of a BigInteger key (where key could be contained in a 23 byte integer) and a BigInteger value (where value could be contained in a 1000 byte integer). You will store Items in an external hash table with 2^{30} slots, each slot can hold 4 Items, and h(key) = key % 2^{30}. To elaborate, you will have a file called info.dat that consists of 2^{30} pages where each page is 4096 bytes. In the file, the presence of an item will be represented by a single byte that is zero and the item will follow (23 bytes for the key and 1000 bytes for the value). Additionally write a driver that allows for user interaction (as shown below) and a status.txt file.

Submission: Upload your java and status files in moodle by the deadline.

Sample interaction:

```
Welcome to Hasher - found file info.dat
Command
> insert 987698769876 12345678901234567890123456789012345678901234567890
Placing in page 930033620. No other items in this page.

Command
> insert 1234567890 98765432198765432198765432
Placing in page 160826066. One other item in this page.

Command
> find 987698769876
987698769876:   12345678901234567890123456789012345678901234567890

Command
> find 1074976391890
1074976391890:   13032465239535709244998683446207672029645483957508793791037996487744678201684
350634882075022259064075350239577162225569849041910436269898063250176408128264547470559850391789443979925509196953591607562514609709597344767995448245440524939468545012149891738352639822030068039944008795312646707776267139534347004640397010406412510258073831873143992554406199601744008416437818026767101586303526928530098870658315 8

Command
> find 119346168530
119346168530:   No such item

Command
> quit
```