Assignment #6

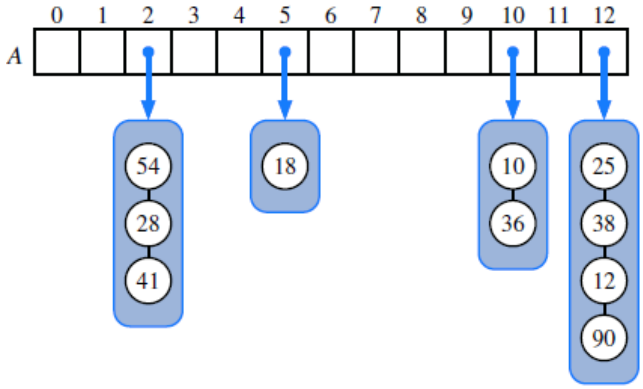
```
Original Due: 3:00 PM, Wednesday, April 28
    Extended: 3:00 PM, Wednesday, May 5
```

You must complete this assignment by yourself. You cannot work with anyone else in the class or with someone outside of the class. You are not allowed to copy solutions from the world wide web. The code you write must be your own.

Provided File:

- A6.java – a shell file.
- input.txt – a input data file.

Description: A simple and efficient way for dealing with collisions in hashing is to make each cell of hash table (i.e., array) point to a linked list of nodes whose data have same hash code. This collision resolution rule is known as separate chaining. See below:



Write a program that implements the separate chaining for `Bank`-type data. Below is the definition of class `Bank`:

```
class Bank {
     public String bankA;
     public int year;
     public double sizeofA;
     public String bankB;
     public double sizeofB;
     public double diff;
}
```

Your program shall repeatedly (i) read one line at a time from input.txt, (ii) create the corresponding node with a `Bank`-type data instance, and (iii) add it to one of the linked lists in separate chaining so that all nodes in each linked list have data with the same hash code. For this assignment, you must use the hash function defined in the shell file.

You program shall print out the expected (average) size of a linked list, the actual smallest linked list size, and the largest linked list size. Below are a few required outputs:

```
C:\Users\jongwook\Downloads>java A6 input.txt 15424
expected=1.0, min=0, max=7

C:\Users\jongwook\Downloads>java A6 input.txt 100
expected=154.24, min=128, max=179

C:\Users\jongwook\Downloads>java A6 input.txt 5000
expected=3.0848, min=0, max=11
```

The first command argument (input.txt) is the provided input file name. The second argument (e.g., 15424, 100, or 5000) is the size of the hash table (array), which has to be between 1 and 15424.

You must use the shell file for this assignment. You are not allowed to remove or change any existing code in the shell file. The shell file contains placeholders (below) that indicate where you have to fill in your code.

```
//-------------------------------------------------------------------------
//
// FILL IN HERE
//



//
//-------------------------------------------------------------------------
```

Submission: your **A6.java** file

General Programming Assignment Requirements:

- Classes must be in the default (no package statement) unless otherwise specified. You will lose 20 points (all points) if you put a package statement in your program.
- If your program that does not compile or does not run, you will lose all points.
- If you submit the wrong file your grade will suffer accordingly. Most likely a 0.
- You must fill in the header for every file you submit or you may lose points.

Checklist: Did you remember to:

- worked on the programming assignment by yourself?
- fill in the header in your file **A6.java**?
- ensure your program does not suffer from a compile error or runtime error?
- ensure your program creates the correct output and that it matches the expected output exactly?
- properly indent your source code so that your indenting is readable and consistent?
- use good names for variables to make your program easy to understand?
- turn in your Java source code in a file named **A6.java** through D2L?