Homework 1

- Implement the perfect skip list class shown on the following slides. You must write a test driver to test your implementation. Your implementation of the perfect skip list must not depend on your test driver because I will use my own test driver to test your program.
import java.util.*;

public class PerfectSkipList {
    private class Node {
        int key;
        Node next[];

        private Node( int k, int size) {
            key = k;
            next = new Node[size]; //Items are initialized to null by Java
        }
    }

    private Node head;
    private int height;

public PerfectSkipList(int keys[], int numKeys) {
//PRE: keys is sorted in ascending order and numKeys <= keys.length
//Create the skip list from the values in keys[0] through keys[numKeys-1]
}

public boolean find(int k) {
//if k is in the list return true otherwise return false
}

public void printList() {
//print each list starting with the top list
//print one list per line with the items separated by a comma
}
private int log2(int bits) {
    //PRE: bits >= 0
    //Implementation taken from StackOverflow
    //https://stackoverflow.com/questions/3305059/
    //how-do-you-calculate-log-base-2-in-java-for-integers
    //returns floor(log(bits))
    int log = 0;
    if( ( bits & 0xffffffff ) != 0 ) { bits >>>= 16; log = 16; }
    if( bits >= 256 ) { bits >>>= 8; log += 8; }
    if( bits >= 16 ) { bits >>>= 4; log += 4; }
    if( bits >= 4 ) { bits >>>= 2; log += 2; }
    return log + ( bits >>>= 1 );
}
Homework 1 Submission

- At the top of the file include a comment that lists your name

- Add a comment for each private method or private instance variable you add

- Email me (tgendreau@uwlax.edu) only one file called PerfectSkipList.java. Do not email me your test driver. The file must contain your implementation of PerfectSkipList. If you use System.out.println to debug your program those lines should be put in a comment (or removed). Your debug output should not print when I test your program.