Comp 110L   Putnam
Project 2: Comparative Search Methods

Create a program that performs the following procedure 100 times.

1. Generate an array of 100,000 integers such that $0 \leq r < 100,000$; also generate a search key in the same range.
   a) Use the **linearSearch** method (Listing 6.6) to search for the key.
   b) Sort the array and use the **binarySearch** method (Listing 6.7) to search for the key.
   c) In both cases, use the following code template to obtain the execution times
      ```
      long startTime = System.currentTimeMillis();
              perform the task
      long endTime = System.currentTimeMillis();
      long executionTime = endTime – startTime;
      ```

After completing the requisite number of times compute the average search time for the **linearSearch** method and the **binarySearch** method. Compute the average percentage of improvement obtained by using the **binarySearch** method over the **linearSearch** method.