import java.util.Arrays;

import java.util.Scanner;

public class jackson2{

static int sumL;

static int sumB;

public static int[] fillRandomArray(int array[])

{

for(int i = 0; i < array.length; i++){

array[i] = 1 + (int)(Math.random() \* 1000000);

}

return array;

}

public static int linearSearch(int array[], int key, int pos){

long t1 = System.nanoTime();

long t2;

if(pos > array.length - 1)

{

t2 = System.nanoTime();

sumL += t2 - t1;

return -1;

}

else if(array[pos] == key)

{

    t2 = System.nanoTime();

sumL += t2 - t1;

return pos;

}

t2 = System.nanoTime();

sumL += t2 - t1;

return linearSearch(array, key, pos+1);

}

public static int binarySearch(int array[], int leftPos, int rightPos, int midPos, int key)

{

long t1 = System.nanoTime();

long t2;

if(array[midPos] == key)

{

t2 = System.nanoTime();

sumB += t2 - t1;

return midPos;

}

else if(leftPos >= rightPos){

t2 = System.nanoTime();

sumB += t2 - t1;

return -1;

}

else if(array[midPos] < key)

{

t2 = System.nanoTime();

sumB += t2 - t1;

return binarySearch(array, midPos + 1, rightPos, ((midPos + 1) + rightPos) / 2, key);

}

else{

t2 = System.nanoTime();

sumB += t2 - t1;

return binarySearch(array, leftPos, midPos - 1, (leftPos + (midPos - 1)) / 2, key);

}

}

public static void main(String[] args)

{

Scanner scan = new Scanner(System.in);

System.out.println("Enter the amount of times you want to run this! ");

int user = scan.nextInt();

for(int i = 0; i < user; i++){

int array[] = new int[1048576];

array = fillRandomArray(array);

int searchNum = 1 + (int)(Math.random() \* 1000000);

Arrays.sort(array);

int posL = linearSearch(array, searchNum, 0);

System.out.printf("Linear search: The number %d was found at pos %d with %d time\n", searchNum, posL, sumL);

int posB = binarySearch(array, 0, array.length - 1, (array.length / 2), searchNum);

System.out.printf("Binary search: The number %d was found at pos %d with %d time\n",searchNum, posB, sumB);

System.out.println();

}

}

}