CSC105 – Programming Logic

Lab07A

**Search Comparisons:** Create a Python program called SearchComparisons.py that asks if a generated list is to be printed. The user enters “y” to print the list, or “n” to not. Anything else will end the program with an “Invalid response” message). The program then asks for the length of the list to be created. An array of randomly generated integers is then created as well as a random integer key. Both are determined by the list length. For example, a list length of 7 will generate 7 random integers and a random key all between 0 and 6. The program does a linear search on the key and reports its position (first occurrence). Then, the program sorts the list in ascending order for a binary search on the key. The binary search captures the number of reads to find the key. All user-defined functions should be completely written by the student **without** the use of utilities in Python built-in modules. See the sample output, user-defined headers and flowcharts below. When complete, please rename your program to “Your name Lab07A.py” and send it to me as an attachment in a Blackboard message. User-defined function headers are:

linearSearch(listIn, key)

bubbleSort(listIn)

binarySearch(listIn, key)

**Sample runs:**

Enter 'y' to print the list, 'n' to not print the list: **y**

Enter list length: **9**

Key = 6

Unsorted list: [6, 7, 5, 1, 3, 6, 1, 4, 7]

Key 6 found in linear search at position: 1

Sorted list: [1, 1, 3, 4, 5, 6, 6, 7, 7]

Key 6 found in binary search after 2 reads.

Enter 'y' to print the list, 'n' to not print the list: **y**

Enter list length: **7**

Key = 2

Unsorted list: [0, 0, 5, 3, 1, 4, 1]

No key found in linear search

Sorted list: [0, 0, 1, 1, 3, 4, 5]

No key found in binary search

Enter 'y' to print the list, 'n' to not print the list: **n**

Enter list length: **1000**

Key = 116

No key found in linear search

No key found in binary search

Enter 'y' to print the list, 'n' to not print the list: **n**

Enter list length: **10000**

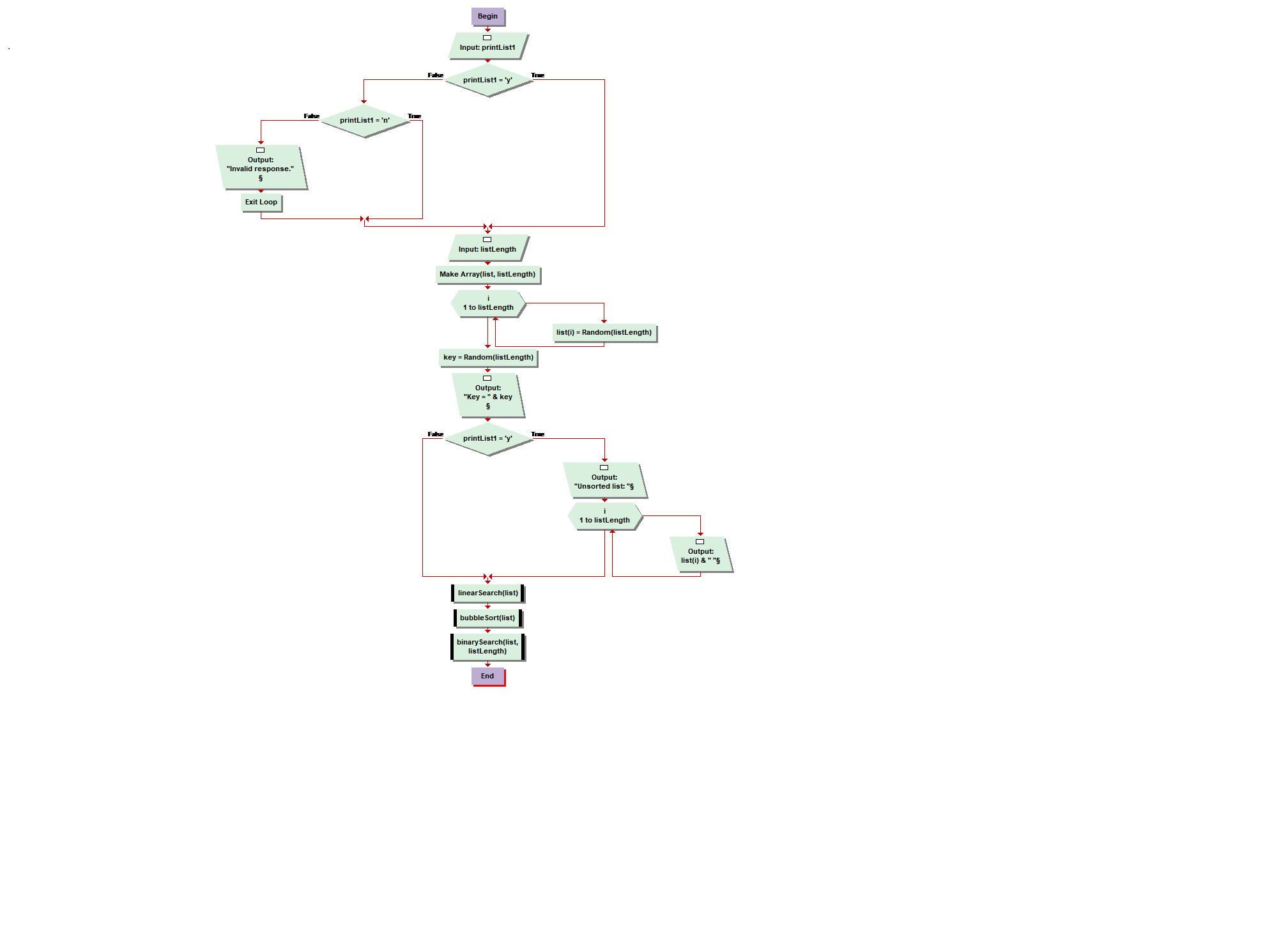
Key = 7252

Key 7252 found in linear search at position: 7563

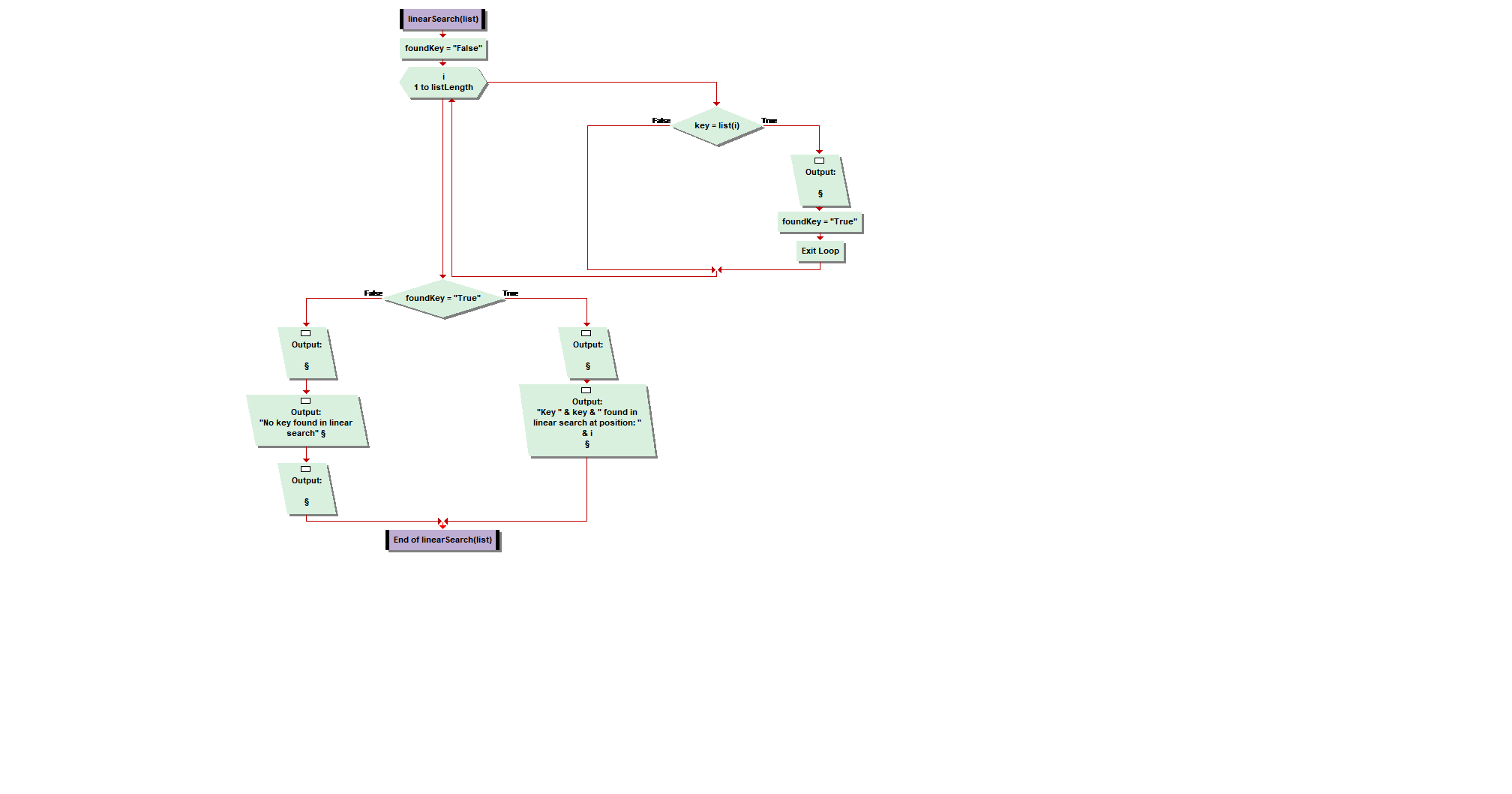
Key 7252 found in binary search after 12 reads.

**See flowcharts below:**

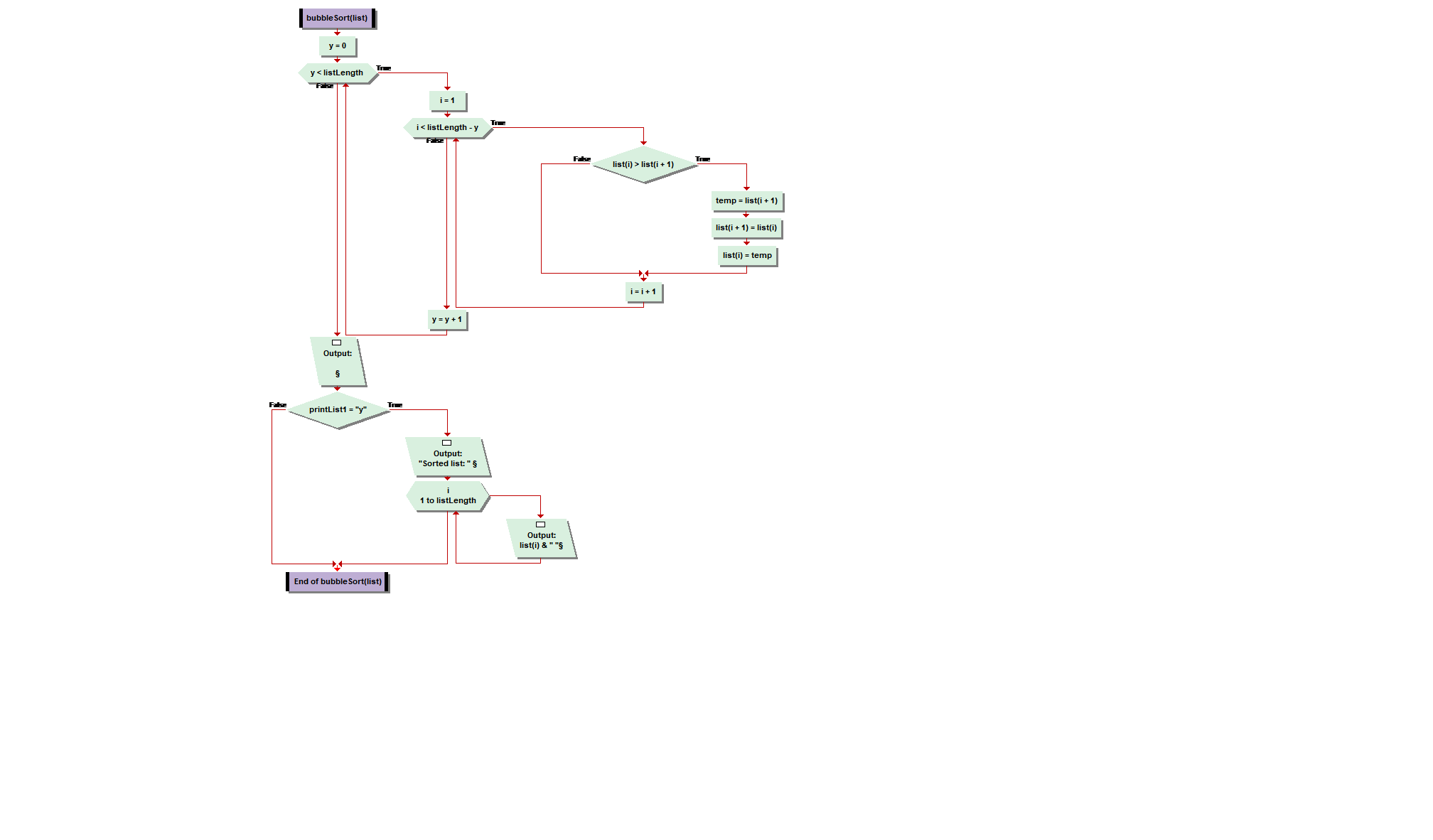
**Main:**



**linearSearch**



**bubbleSort**



**binarySearch**

