HACETTEPE UNIVERSITY
BBM 204 SOFTWARE LABORATORY II
Homework2

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1   Introduction

Binary search, as fundamental algorithm in searching, is employed to rapidly find a value in a sorted
sequence. Binary search actually works on a diminishing subsequence of the starting sequence
where the target value is searched which is called the search space. At each stage, the median
value in the search space is compared to target value and half of the search space is abolished. As
a result, the algorithm leads us to have a search space consisting of a single element, the target
value. As binary searching expedite searching process, it can be used in query based searching
events. This homework, we found out how sorting and binary searching can be efficiently employed
for seeking specific queries entered by the client.

2   Assignment Explain

2.1   What is the required?

The purpose of this assignment is to complete the desired word. The id of the completed words
will be printed on the screen in descending order. The name of the file, how many results are to be
written and the word to be completed will be taken as an argument from the user with command
line.
You should implement this assignment in two stages:
a. Sort the terms alphabetically
b. Binary search to find all terms that start with the given query; sort the matching terms in
descending order by weight(id).

2.2   Problem solution

The name of the file(args[0]), how many results are to be written(args[1])] and the word to be
completed(args[2]) will be taken as an argument from the user with command line.

First line in the input.txt shows the file has how many element.(it is in the code "numberO-
fElement") And the other lines consist of two sections separated by a tab character. A class was
created(attributeOfFile) because the properties of these lines are the same. Each sections' parts
add to the array list which name is "a" and a's type is the class type. First part of these sections'
represent of weight((private) in the class is id), second part is any string((private) it is name in
the class).
Then this items are sorted by the program. The sort type is heap sort.
In the sequel the keyword must be searched using binary search in the sorted list. This is done
the method of "binaryS". This method finds the first word matching the keyword with the binary
search. The other matching word is searched linearly to the right and to the left.
The list obtained as a result of these operations is in order of small to large in terms of id. The
translate method was used to obtain a list in descending order.

Note: id variable's type is integer.

2.3 Sample Input-Output

Input	output
cities.txt 7 Asb	74583 Asbest, Russia
	74583 Asbest, Russia
	74583 Asbest, Russia
	30772 Asbe Teferi, Ethiopia
	16116 Asbury Park, New Jersey, United States
	8700 Asbury Lake, Florida, United States
	7190 Asbestos, Quebec, Canada

Table 1: first example table.

Input	output
pu-buildings.txt 4 cl	8107 Clio Hall
	8095 Class of 1886 Clubhouse
	8087 Class of 1887 Boathouse
	8074 Class of 1901 Hall

Table 2: second example input-output.

Input	output
baby-names.txt 4 cl	12540 Joshua
	12419 Joseph
	10516 John
	9263 Jonathan
	9142 Jordan
	6003 Jose
	5454 Josiah
	3213 Jocelyn
	2932 Jonah
	2817 Jordyn
	2745 Joel

3 References

http://quiz.geeksforgeeks.org/heap-sort/