CSE2025 Data Structures
Project #1
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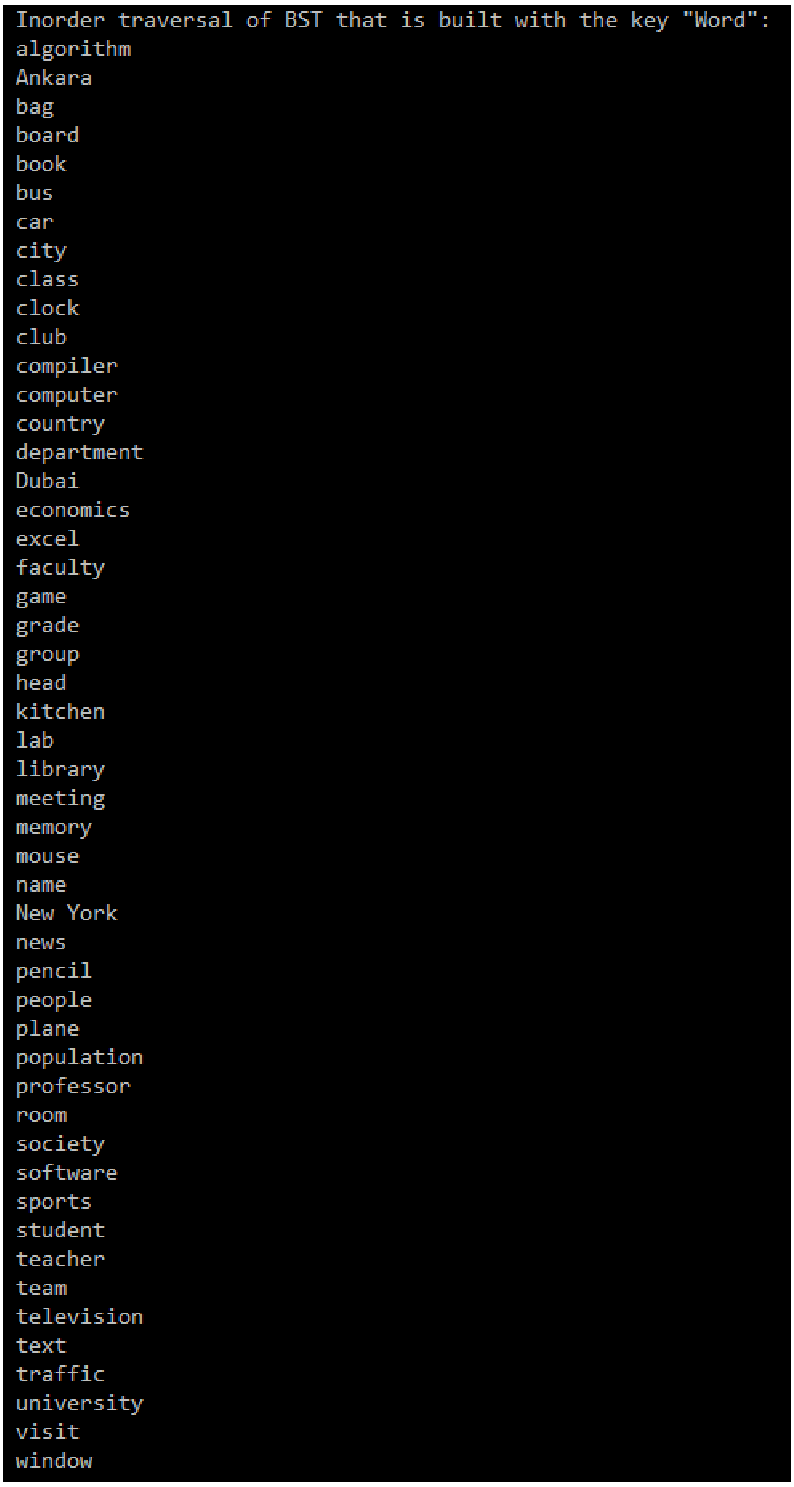
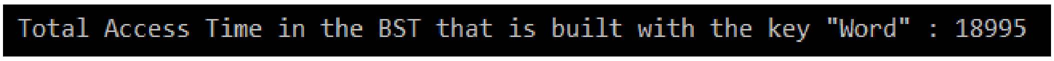
a) BST with the key “Word” is built and its inorder traversal is printed. Below there is a screenshot of the output.



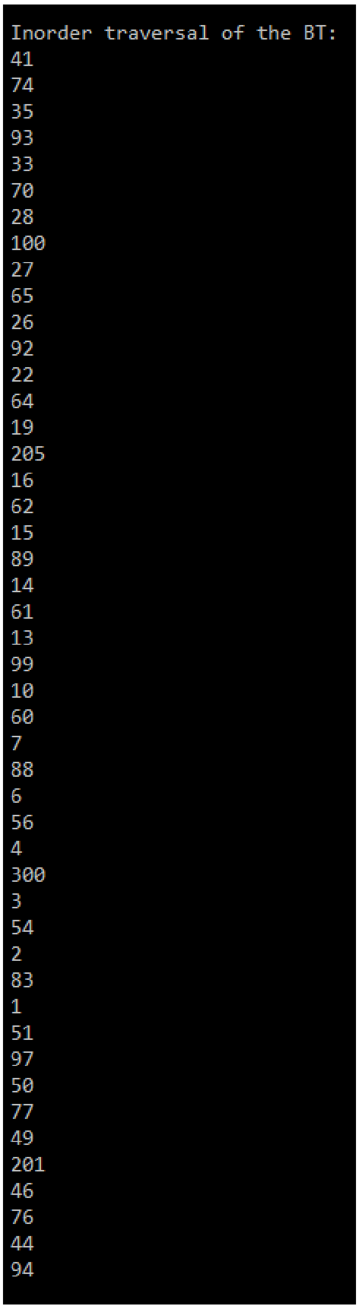
```
Inorder traversal of BST that is built with the key "Word":
algorithm
Ankara
bag
board
book
bus
car
city
class
clock
club
compiler
computer
country
department
Dubai
economics
excel
faculty
game
grade
group
head
kitchen
lab
library
meeting
memory
mouse
name
New York
news
pencil
people
plane
population
professor
room
society
software
sports
student
teacher
team
television
text
traffic
university
visit
window
```

b) Total access time in the BST that is built in (a) is calculated using the given frequencies of the words. It is found as 18995. The screenshot of the output is given below.



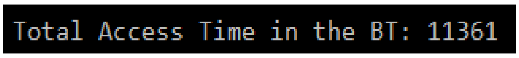
```
Total Access Time in the BST that is built with the key "Word" : 18995
```

c) A binary search tree was built with the key “Frequency”. Then the frequencies that are kept in the BST was kept in an array. Frequencies kept in the array in descending order to minimize the total access time. The array is used to construct a binary tree with minimized access time. Inorder traversal of the BT is printed as can be seen in the output below.



```
Inorder traversal of the BT:
41
74
35
93
33
70
28
100
27
65
26
92
22
64
19
205
16
62
15
89
14
61
13
99
10
60
7
88
6
56
4
300
3
54
2
83
1
51
97
50
77
49
201
46
76
44
94
```

d) Total access time in the BT that is built in (c) is calculated using the given frequencies of the words. It is found as 11361. The screenshot of the output is given below.



```
Total Access Time in the BT: 11361
```

e) The tree that is used to find total access time in (b) is built with the key “Word”. On the other hand, the tree that is used to find total access time in (d) is built according to descending orders of frequencies, so the total access time can be minimized. Therefore, total access time that is calculated in (d) is less than the total access time that is calculated in (b).