

EC4070: Data Structures and Algorithms

LAB 05

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SEMESTER 4

EC4070

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Q1.

```
1  import java.util.Scanner;
2
3  public class CustomHT {
4      private static final int TABLE_SIZE = 256;
5
6      private CharacterFrequency[] table;
7
8      public CustomHT() {
9          table = new CharacterFrequency[TABLE_SIZE];
10     }
11
12     public void put(char key) {
13         int index = key;
14         if (table[index] == null) {
15             table[index] = new CharacterFrequency(key);
16         } else {
17             table[index].frequency++;
18         }
19     }
20
21     public CharacterFrequency get(char key) {
22         int index = key;
23         return table[index];
24     }
25
26     public static class CharacterFrequency {
27         char character;
28         int frequency;
29
30         public CharacterFrequency(char character) {
31             this.character = character;
32             this.frequency = 1;
33         }
34     }
35
36     public static void main(String[] args) {
37         Scanner scanner = new Scanner(System.in);
38         System.out.print("Enter a string: ");
39         String input = scanner.nextLine();
40         scanner.close();
41
42         CustomHT CustomHT = new CustomHT();
43
44         for (char c : input.toCharArray()) {
45             if (Character.isLetterOrDigit(c) || c == ' ' || c == '-' || c == '_' || c == '?') {
46                 CustomHT.put(c);
47             }
48         }
49
50         char maxChar = ' ';
51         int maxCount = 0;
52
53         for (int i = 0; i < CustomHT.TABLE_SIZE; i++) {
54             CustomHT.CharacterFrequency cf = CustomHT.table[i];
55             if (cf != null) {
56                 if (cf.frequency > maxCount || (cf.frequency == maxCount && cf.character < maxChar)) {
57                     maxChar = cf.character;
58                     maxCount = cf.frequency;
59                 }
60             }
61         }
62
63         System.out.println(maxChar + " " + maxCount);
64     }
65 }
```

```
C:\Users\2021E075\OneDrive - University of Jaffna\lab5>javac CustomHT.java
C:\Users\2021E075\OneDrive - University of Jaffna\lab5>java
C:\Users\2021E075\OneDrive - University of Jaffna\lab5>java CustomHT
Enter a string: Pulkit is a dog???????
? 8
```

```
C:\Users\2021E075\OneDrive - University of Jaffna\lab5>java CustomHT
Enter a string: aaAAAAAAAArrrrrEE
A 8
C:\Users\2021E075\OneDrive - University of Jaffna\lab5>
```

Q2.