HW4

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HW4

HW4 (Due on 10/17)

Maintain an ordered keyword list.

- A keyword is a tuple of [String name, Integer count, Double weight]
- Keep the list in order by its count while adding or deleting elements
- For the list structure, you can
  - Use java.util.ArrayList, or
  - java.util.LinkedList, or
  - Develop it by yourself
- Given a sequence of operations in a txt file, parse the txt file and execute each operation accordingly

Keyword

- A keyword is a tuple of [String *name*, Integer *count*, Double *weight*]
  - For example:

    {
        name: “Fang”,
        count: 3,
        weight: 5.5
    }
- A keyword should output in format **[name, count, weight]** :
  - [Fang,3,5.5]

Add and Output

operations	description
add(Keyword k)	Insert k to the list in order
outputIndex(int i)	Output the ith keyword in the list
outputCount(int c)	Output all keywords whose count is equal to c
outputHas(string s)	Output all keywords whose name contains s
outputName(string s)	Output all keywords whose name is equal to s
outputFirstN(int n)	Output the first n keywords
outputScore()	Output the score of the whole list

I/O Example: Add

- To do: Insert a keyword [k,c,w] to the list in order
- Input:
  - Token1 : a constant “add”
  - Token2 : keyword name **k**
  - Token3 : keyword count **c**
  - Token4 : keyword weight **w**
  - EX: add Fang 3 1.5
- Smaller count placed in the front. If equal, smaller weight is placed in the front.

```
[MIS,2,1.2] [UCSB,2,2.2] [Food,3,0.1] [Data,3,0.3] [NCCU,3,0.8] [Fang,3,1.5] [Structure,4,2.1] [Badminton,4,2.3] [Yu,5,1.2]
```

I/O Example: outputIndex

- To do: Output the ith keyword in the list
- Input:
  - Token1 : a constant “outputIndex”
  - Token2 : an index **i** in our keyword list
  - EX: outputIndex 3
- Output:
  - If **i** is out of bound, simply output a line of “InvalidOperation”: InvalidOperation
  - If **i** is legal: [NCCU,4,9.9]

I/O Example: outputCount

- To do: Output all keywords whose count is equal to c in order
- Input:
  - Token1 : a constant “outputCount”
  - Token2 : an integer **c**
  - EX: outputCount 4
- Output:
  - If there is no keyword whose count is equal to **c,** simply output a line of constant

    “NotFound”: NotFound
  - If there are any (separated by one space):

    [OK,4,2.2] [MIS,4,3.3] [NCCU,4,9.9]

I/O Example: outputHas

- To do: Output all keywords whose name contains s
- Input:
  - Token1 : a constant “outputHas”
  - Token2 : a pattern string **s**
  - EX: outputHas ang
- Output:
  - If there is no keyword whose name contains **s,** simply output a line of constant “NotFound”:

    NotFound
  - If there are any (separated by one space):

    [Stanger,4,2.2] [Rang,4,3.3] [Fang,4,9.9]

I/O Example: outputName

- To do: Output all keywords whose name is equal to s
- Input:
  - Token1 : a constant “outputName”
  - Token2 : a string **s**
  - EX: outputName Fang
- Output:
  - If there is no keyword whose name is equal to **s,** simply output a line of constant “NotFound”: NotFound
  - If there are any (separated by one space): [Fang,4,9.9]

I/O Example: outputFirstN

- To do: Output the first N Keywords, if N <= size of list
- Input:
  - Token1 : a constant “outputFirstN”
  - Token2 : an signed integer **N**
  - EX: outputFirstN 3
- Output:
  - If N > **size of keyword list,** simply output a line of constant “InvalidOperation”: InvalidOperation
  - If N is legal (separated by one space):

    [Stanger,4,2.2] [Rang,4,3.3] [Fang,4,9.9]

I/O Example: outputScore

- To do: Output the score of the whole list
  - **Σ(count*weight)**
- Input:
  - Token1 : a constant “outputScore”
  - EX: outputScore
- Output:
  - Simply output a line of score
  - EX: 108.5

Delete

operations	description
deleteIndex(int i)	Delete the ith keyword in the list
deleteCount(int c)	Delete all keywords whose count is equal to c
deleteHas(string s)	Delete all keywords whose name contains s
deleteName(string s)	Delete all keywords whose name is equal to s
deleteFirst(int n)	Delete the first n keywords

I/O Example: deleteIndex

- To do: Delete the ith keyword in the list
- Input:
  - Token1 : a constant “deleteIndex”
  - Token2 : an index **i** in our keyword list
  - EX: deleteIndex 3

I/O Example: deleteCount

- To do: Delete all keywords whose count is equal to c
- Input:
  - Token1 : a constant “deleteCount”
  - Token2 : an integer **c**
  - EX: deleteCount 4

I/O Example: deleteHas

- To do: Delete all keywords whose name contains s
- Input:
  - Token1 : a constant “deleteHas”
  - Token2 : a pattern string **s**
  - EX: deleteHas ang

I/O Example: deleteName

- To do: Delete all keywords whose name is equal to s
- Input:
  - Token1 : a constant “deleteName”
  - Token2 : a string **s**
  - EX: deleteName Fang

I/O Example: deleteFirstN

- To do: Delete the first N Keywords, if N <= size of list
- Input:
  - Token1 : a constant “deleteFirstN”
  - Token2 : an signed integer **N**
  - EX: deleteFirstN 2

Input file

- You need to read the sequence of operations from a txt file
- The format is firm
- Raise an exception if the input does not match the format

```
add Fang 3 1.5
add Yu 5 1.2
add NCCU 3 0.8
add UCSB 2 2.2
add MIS 2 1.2
add Badminton 4 2.3
add Food 3 0.1
add Data 3 0.3
add Structure 4 2.1
outputScore
deleteCount 3
outputCount 2
outputName Yu
deleteName Yu
outputHas a
deleteHas a
outputIndex 2
deleteIndex 4
deleteFirstN 1
outputFirstN 3
deleteAll
```

Output

input →

output →

```
Please input the test file name.
input.txt
[Fang,3,1.5]
[Fang,3,1.5] [Yu,5,1.2]
38.5
[MIS,2,1.2] [UCSB,2,2.2]
[Yu,5,1.2]
[Badminton,4,2.3]
[Structure,4,2.1]
InvalidOperation
```

Notice

- The group formation for this semester is complete, please send your team's GitHub link and contact information via Google form!

  https://forms.gle/bUrkhmTQq1tHYEpd8

- The deadline for homework submission will be Thursday. Grades will be announced on Friday, and the late submission deadline is the following Thursday. Please make sure to complete your homework and submit it accordingly.