McGill | School of Continuing Studies | École d'éducation permanente

Assignment 1
Due date: June 14th, 2021
At 11:55am

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(Group of 3)

General instructions:

This is not an individual Assignment. Team of 3.

The assignment has to be done in Java.

For the submission you have to submit the whole NetBeans or eclipse project.

Only one team member is required to submit the project. Please make sure to mention the name for all 3 members.

No late submission is accepted.

Scenario:

The Society for the Protection of Birds has asked for your help in determining the frequency of sightings of various species of backyard birds. Observers in different locations are asked to write down the names of all birds they have seen in a given time period, and save the result into a text file. For example, a file that contains the following:

Robin

Grackle

Robin

Starling

Chickadee

Starling

Robin

This means that the observer saw 3 robins, 2 starlings 1 grackle and 1 chickadee in the observation period.

All the text files from all the observers have been put together into a large file (birds.txt). In order to do the analysis, you should:

- Create your own link list to keep 2 information about the birds: first the name of the birds and determine the frequency of observation of each bird. You will use a Node structure that contains the name of the bird as a string and an integer representing the number of times each bird has been mentioned in the file. (hint: you can use the implementation provided by the book for singly linked list, however you need to do the appropriate modifications).
- As you read the file, you will check to see whether the bird is already listed in the list.
    - If it is, increase the frequency by one.
    - If the bird does not appear on the list, make a new node, add the bird's name and set the frequency to 1.
- Once this task is complete, sort the list by frequency of observation and print a list of birds and their frequencies.

- Finally, open up a second file (birds2.txt). This contains a list of non-indigenous (foreign) birds to be excluded. Remove these birds from the list and print the list, by frequencies again.

The project will include the following:

- Comments: in the comments for every method, you have to specify the time complexity of that method, and finally for the main method, specify the time complexity of the whole program.

- Handling IO Exception

- Not using already defined data structure in Java such as link list. You have to create your own singly linked list.