CSE 2010, HW3

Due Thu Feb 23 at the start of your lab section; Submit Server: class = cse2010, assignment = hw3S*x*Individual

Due Thu Feb 23 at the end of your lab section; Submit Server: class = cse2010, assignment = hw3S*x*GroupHelp

x is 14, 23, or c—1 and 4 are merged into 14, ..., c is for C.

Many entities, such as electronics and biological organisms, can be organized in a taxonmy. How would you design a system that stores the taxonomy and allow queries on the taxonmy?

The goal of HW3 is to build a tree from categories of entities and answer queries on the tree. Your submission has a tree with a linked structure of tree nodes and supports (at least) the following operations:

- addChild(childNode) // to maintain alphabetical/lexicographical order of the children
- getChildren()
- getParent()

For each node, you may not assume it has a fixed or maximum number of children.

We will evaluate your submission on code01.fit.edu, so you are strongly recommended to ensure your program functions properly on code01.fit.edu. To preserve invisible characters, we strongly recommend you to download, NOT copy and paste, input data files.

Input: Input is from the command-line arguments for HW3.java (hw3.c) in this order:

1. filename of the data—the first line has the top category, followed by its sub-categories; each of the following lines has a category, followed by its sub-categories.
2. filename of queries, each line has one of the following queries:
   - DirectSupercategory *category*
   - DirectSubcategories *category*
   - AllSupercategories *category*
   - AllSubcategories *category*
   - NumberOfAllSupercategories *category*
   - NumberOfAllSubcategories *category*
   - IsSupercategory *category supercategory*
   - IsSubcategory *category subcategory*
   - ClosestCommonSupercategory *category*1 *category*2

You may assume categories in the queries exist in the data. Sample input files are on the course website.

Output: Output goes to the standard output (screen), each line has an answer with the corresponding query:

- DirectSupercategory *category supercategory*
- DirectSubcategories *category subcategory*1 *subcategory*2 ...
- AllSupercategories *category supercategory*1 *supercategory*2 ...
- AllSubcategories *category subcategory*1 *subcategory*2 ...
- NumberOfAllSupercategories *category count*
- NumberOfAllSubcategories *category count*
- IsSupercategory *category supercategory yes/no*
- IsSubcategory *category subcategory yes/no*
- ClosestCommonSupercategory *category*1 *category*2 *closestCommonSupercategory*

DirectSubcategories (if any) are in the alphabetical/lexicographical order. AllSubcategories (if any) are in "pre-order." AllSupercategories (if any) are in the order of supercategory, grand-supercategory, ... IsSupercategory/IsSubcategory refers to any supercategory/subcategory. ClosestCommonSupercategory (if any) is the deepest supercategory of both categories. Sample output is on the course website.

Submission: Submit HW3.java (hw3.c) that has the main method and other program files. Submissions for Indvidual and GroupHelp have the same guidelines as HW1.

Note the late penalty on the syllabus if you submit after the due date and time as specified at the top of the assignment.