

CSC541

Project 1, deliverable 2: Multi-layer switching

1 Data persistence in relational form

Objective: Write a program that simulates the look up tables for the tiered system.

The input is given in the following format:

```
Application_1;Serverno1_in_tier_1;Serverno3_in_tier_2;Serverno6_in_tier3
Application_2;Serverno2_in_tier_1; Serverno2_in_tier_2;Serverno8_in_tier3
Application_1;Serverno2_in_tier_1;Serverno4_in_tier_2;Serverno10_in_tier3
Application_2;Serverno6_in_tier_1; Serverno2_in_tier_2;Serverno8_in_tier3
Application_2;Serverno7_in_tier_1; Serverno12_in_tier_2;Serverno8_in_tier3
Application_1;Serverno3_in_tier_1;Serverno2_in_tier_2;Serverno8_in_tier3
Application_1;Serverno19_in_tier_1;Serverno4_in_tier_2;Serverno8_in_tier3
Application_5;Serverno339_in_tier_1; Serverno29_in_tier_2;Serverno2_in_tier3
Application_12;Serverno3_in_tier_1; Serverno1_in_tier_2;Serverno4_in_tier3
Application_1;Serverno1_in_tier_1;Serverno3_in_tier_2;Serverno6_in_tier3
```

Note: The above format means:

1. When requests of Application_1 arrive at Serverno1 in tier 1 they should be routed to Serverno3 in tier 2 and then from there on should be routed to serverno6 in tier 3. Also Application_1 when routed to Serverno1 in tier 1 is routed to Serverno3 in tier 2, but when routed to Serverno2 in tier 1, it is routed to Serverno4 in tier 2.
2. Each line of entry in the table is not unique i.e the combination of the Application_no, Server_no in tier1, Server_no in tier2 and Serverno in tier3 is not unique and can be duplicated throughout the file. However, in your program, when scanning the input file, make sure you prevent adding duplicate entries to your data structure. E.g., the last line and the first line are the same in the above given set of entries, take care to store this information only once in your data structure.

Your program should run with the following arguments:

Groupid_del2proj1.exe Name_of_input_file.txt Application_no

Name_of_input_file.txt has the lookup information in the format given above.
Application_no is the input parameter.

Output: Return the number of **unique** servers in tier1, tier 2 and tier 3 that accept requests of the application Application_no

Example: Suppose that file lookup.txt contains the following information:

Application_1;Serverno1_in_tier_1;Serverno3_in_tier_2;Serverno6_in_tier3
Application_2;Serverno2_in_tier_1; Serverno2_in_tier_2;Serverno10_in_tier3
Application_1;Serverno2_in_tier_1;Serverno4_in_tier_2;Serverno8_in_tier3
Application_2;Serverno6_in_tier_1; Serverno2_in_tier_2;Serverno8_in_tier3
Application_2;Serverno7_in_tier_1; Serverno12_in_tier_2;Serverno8_in_tier3
Application_1;Serverno3_in_tier_1;Serverno2_in_tier_2;Serverno8_in_tier3
Application_1;Serverno19_in_tier_1;Serverno4_in_tier_2;Serverno8_in_tier3
Application_5;Serverno339_in_tier_1; Serverno29_in_tier_2;Serverno2_in_tier3
Application_12;Serverno3_in_tier_1; Serverno1_in_tier_2;Serverno4_in_tier3
Application_1;Serverno1_in_tier_1;Serverno3_in_tier_2;Serverno6_in_tier3

Input: Groupid_del2proj1.exe lookup.txt Application_1

Output: Tier 1: 4 Tier 2: 3 Tier 3: 2

Here the output lists the number of unique servers that cater to Application_1 in tier 1, number of unique servers that cater to Application_1 in tier 2 and number of unique servers that cater to Application_1 in tier 3. (Output ignores duplicate entries)

Input: Groupid_del2proj1.exe lookup.txt Application_2

Output: Tier 1: 3 Tier 2: 2 Tier 3: 2

Note:

1. You'll find an input file with about 110,000 lines in <http://courses.ncsu.edu/csc541/common/projectFiles/lookup.txt>.
2. NO GUI is required to be provided.
3. Use any language you are comfortable with.
4. MAKE SURE THAT YOUR PROGRAM COMPILES AND RUNS IN EOS OR VCL MACHINES.
(If testing with VCL, please figure out which VCL image suitable, no support will be provided to you for selecting a supporting image)
5. The input file can contain a maximum of 200,000 entries only.
6. Use any data structure you think is suitable.
7. **YOUR OUTPUT FILENAME SHOULD BE Groupid_del2proj1.exe or Groupid_del2proj1.jar (the latter refers to an executable jar)**
8. **You need to submit the instructions to create an executable file, no other format apart from the ones described above is accepted.**
9. **Please submit your executable file as well.**