Lab Assignment-2

IIIT-Delhi. 10th August 2017. Due by 23:59pm on 10th January 2017

Instructor: Vivek Kumar

No extensions will be provided. Any submission after the deadline will not be evaluated. If you see an ambiguity or inconsistency in a question, please seek a clarification from the teaching staff.

NOTE: Attendance in the lab is mandatory.

Plagiarism: All submitted homeworks are expected to be the result of your individual effort. You should never misrepresent someone else's work as your own. In case any plagiarism case is detected, it will be dealt very seriously and the assignment marks will also be nullified.

In this assignment our focus is on implementing a college ranking system without any GUI. The software system should be able to rank any number of colleges provided by the user as an input. You have to figure out what should be the classes from the problem statement and properties of each class (fields and methods). An improper design will not fetch marks.

Problem description

Every college to be ranked has a mess, a hostel, a library, and academics. Each of these individual components of the college should be ranked as per the following criteria:

1) Mess: Its rank is calculated using values such as food availability, food nutrition value, hygiene maintenance and food delivery delay. Mess of one college is compared with other college's mess by first looking at food availability, if that is same with both colleges then food nutrition is checked. If this is also same then hygiene maintenance and lastly food delivery delay is checked.

2) Hostel: Its rank is calculated using room conditions, studying facilities, cleanliness, recreational facilities. Hostel of one college is compared with other college's hostel by first looking at room conditions,. If that is same with both colleges then studying facility is checked followed by cleanliness and recreational facilities.

3) Library: Its rank is calculated by considering books availability, digital facility and system efficiency values. Library of one college is compared to the other library by comparing the average of these three criterias.

4) Academics: Its rank is calculated based on following criterias: knowledge imparted, domains covered, and course structure efficiency. Academics of one college is compared to the other academics based on the value obtained from adding the first two values (knowledge imparted, domains covered) with two times the last value (course structure efficiency).

The final ranking of a college is the weighted average of rank of Mess (25%), rank of Hostel (20%), rank of Library (25%) and rank of Academics (30%). If the weighted average comes out to be same then college with less fees is taken into priority. This is followed by taking into consideration the NAAC certificate of the college (college with A certificate is preferred).

Note: You should **only** use the concepts already taught in the class. As a hint, aim at looking similarity in structure of the different classes and try to form a common layout for them.

Sample Program Execution

Green color text are my comments whereas blue color texts are actual program execution below:

First Line below contains integer 'm' which denotes number of colleges.
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Each college is followed by the following lines with space separated **float type** values
<Name>
Mess <food availability> <food nutrition value> < hygiene-maintenance> <food-delivery-delay>
Hostel <room-conditions> <studying-facilities> <cleanliness> <recreational-facilities>
Library <books-availability> <digital-facility> <system-efficiency>
Academics < knowledge-imparted> <domains-covered> <course-structure-efficiency>
Fees <amount>
NAAC Certificate <grade>

DTU
Mess 3.0 2.5 1.9 3.6
Hostel 4.0 9.8 5.6 7.8
Library 8.0 6.0 3.9
Academics 6.7 5.4 3.9
Fees 10000
NAAC Certificate A

IIITD
Mess 1.0 2.5 1.9 3.6

Hostel 8.9 3.4 7.8 3.2
Library 10.0 11.0 9.9
Academics 9.7 4.4 8
Fees 20000
NAAC Certificate A

The output for the above input will be as follows:

List of colleges as per their ranking (starting from rank-1) is as following:

IIITD
DTU

Bonus marks

Sorting is one of the main components in this problem. Bonus is to come up with your own sorting algorithm (the algorithm should be **efficient in terms of complexity**) and use that sorting algorithm to sort all the necessary values. Bonus marks will only be given if **no inbuilt sorting API** is used.