2017 ADB Final Project Specifications
Goal: Course Roadmap Application

Definition

It is very important for a university or graduate school freshman to find the expected courses that matches his/her interests while in school time. The problem is, sometimes students don't really know which courses should they take to fulfilled the needed for their interest areas. Such students can only rely on information from other students or faculties, information from the university websites and courses syllabus by themselves, and an integrated searching and matching platform is missing.

Your goal is to design a platform to provide guides for these students in **CS department**, help them develop their interests, and make a customized course roadmap, using the concepts you have learned in the Advanced Databases course.

Requirements

Your application should meet the following basic requirements:

1. *Basic elements*: The platform must contain CS related courses, the specific areas and topics they belongs to, the prerequisites or relationships among them, and professors that provide these courses or focus on the areas. e.g., for the student who would like to learn deep learning, the concept of *linear transformation* in *linear algebra, derivative* in *calculus* and *information theory* in *statistics* are needed.

2. *Basic Querying*: Students should be able to execute search queries for courses based on topics, lecturers, schools, etc.

3. *Exploration Querying*: In order to allow users to develop understanding of the area they want to know, starting from one course, area or school, users should be able to explore the relationships, such as finding prerequisites courses or advanced courses, relevant areas and courses, schools or professor that focus on a certain area etc.

4. *Graph Database:* In order to maintain the relationships between courses, topics, areas, departments and faculties, please utilize pne graph database of your choice to implement this application. (You can use more than one databases if you need, but at least the one managing the relationships should be graph database.)

Other specifications of this project are listed below:

1. You can use any non-commercial programming languages or tools to implement the application, as long as the technical requirements above are satisfied. The application can also be offline, but for demonstration purpose we strongly recommend to put the application online.

2. Your application can be running solely on command line interface, but for demonstration purposes and the completeness of the project, we highly recommend to implement a GUI for your application. It can be either a website, smartphone APP, etc. (Consider it as a startup project!)

3. To demonstrate that your application is working, there should be at least 10 CS-related departments(not restricted to the same school), such as statistics, electristics engineer departments and so on, and at least 500 courses in total in your databases for querying. We highly recommend you to use real data of courses and departments of any countries. (**hints**)the topics of each course could be retrieved from the syllabus of the courses.

Grouping

In this project, please form groups of 4~5 people. The grouping spreadsheet can be found here:
https://docs.google.com/spreadsheets/d/19DuvEFzQIQSERvZAmJtisE_Qo2W3TANPIIWEof3pgK0/edit?usp=sharing

Grading

1. **Basic requirement (60%)**: Achieve the goal of a fully-functional Course Roadmap Application. This includes the support of all the mechanisms and functionalities listed above.

2. **Report (20%)**: Explain the concepts and techniques you use, and which parts are related to the Advanced Database course. Additionally, **you need to provide details of what each member contributed** in your group.

3. **Database structure (20%)**: Provide detailed information on the data model and the schema/s you designed. This also goes in the report.

4. **Bonus (10%)**: Besides having a fully functional Course Roadmap Application, we are excited to see the surprising features you will implement. We have allotted a portion of the grading to creativity and originality, and expect to see interesting and surprising ideas to help students to discover their interests.

If you have any questions related to the project, ask any of the TAs. Their contact information can be found in the iLMS system.