niINFO 5100 – APPLICATION ENGINEERING & DEVELOPMENT

Assignment 3 – Team Work

Project Name:

Analysis of Employment Quality From Each Colleges Graduated From NEU

Group Member:

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1. Introduction

The aim of this project is to design an evaluating system, that can measure the quality of the education from various colleges to their students, including information gathering and data aggregation. Meanwhile, through the system evaluation, current students will be able to give suggestions about the best curriculum combination and decide where to go.

In this system, the evaluation processing will be divided into several classes and subclasses including course index, student information, education index and employment condition index. These items are relatively corresponding with their subclasses, and each index have been given its own weight. And finally, the employment quality score of each student will be given and scored by the correlation analysis.

2. Class

a) Class: Course

The course class will be given four input indexes:

- Course Name (String)
- Course ID (String)
- Course Credit (Int)
- Course Department (Class)

These two indexes will be linked into a corresponding array list, like [Application_Engineering_&_Development, 5100].

And eight functions will be applied in this class.

- GetName() is used to get course name.

- SetName() is used to set course name.
- SetId() is used to set course ID.
- GetId() is used to get course ID.
- SetCredit() is used to set course ID.
- GetCredit() is used to get course ID.
- SetDep() is used to set class department information.
- GetDep() is used to get class department information.

b) Class: Student

The student information class will be given twelve input indexes:

- Student Name (String)
- Student ID (String)
- Student Sexual (String)
- Student Department (Class)
- Education Type: Undergraduate/Graduate/PHD (String)
- Course Serial Number, which is quoted from class course (Long)
- Grade (Int)
- Whether employed 12 months after graduation (Boolean)
- Salaries in 12 months after graduation (Float)
- Salaries in 36 months after graduation (Float)
- Salaries in 60 months after graduation (Float)
- Salaries standard among peers in the same major (Float)

These indexes course serial number and grade will be linked into a corresponding array list, like [5100, 90].

And eleven functions will be applied in this class.

- GetName() is used to get student name.
- SetName() is used to set student name.
- SetId() is used to set student ID.
- GetId() is used to get student ID.
- SetSex() is used to set student sexual.
- GetSex() is used to get student sexual.
- SetDep() is used to set class department information.
- GetDep() is used to get class department information.
- SetE() is used to set student education background.
- GetDep() is used to get student education background.
- GetGrade() is used to get student grade.

c) Class: Education

The education class will be given three input indexes:

- Education Department (String)
- Remark given by peers in the same major (Integer)
- Remark given by the employers (Integer)

These remarks will be entered as a score from 0 to 10.

And six functions will be applied in this class.

- SetDep() is used to set class department information.
- GetDep() is used to get class department information.
- SetMajor() is used to set remark given by peers in the same major.
- GetMajor() is used to get remark given by peers in the same major.
- SetEmploy() is used to set remark given by the employers.
- GetGrade() is used to get remark given by the employers.

d) Class: Employment

The employment class will be given six input indexes:

- Reputation of the employed company (Integer)
- Alumni Performance (Integer)
- Relations between the colleges and employers (Integer)
- Employment rate (Float)
- Average salaries (Float)
- Employment Department (Class)

These first three indexes will be entered as a score from 0 to 10.

And twelve functions will be applied in this class.

- SetRepu() is used to set employment reputation.
- GetRepu() is used to get employment reputation.
- SetAlumniPer() is used to set alumni performance.
- GetAlumniPer () is used to get alumni performance.
- SetRelation() is used to set relations between the colleges and employers.
- GetRelation() is used to get relations between the colleges and employers.
- SetDep() is used to set class department information.
- GetDep() is used to get class department information.
- SetRate() is used to set employment rate.
- GetRate() is used to get employment rate.
- SetAvgSala() is used to set average salary.
- GetAvgSala() is used to get average salary.

The average salaries in relatively connected with the salaries after several months after graduation in class student information. And the employment rate in relatively connected with the whether employed 12 months after graduation in class student information.

The overall evaluation of the college will be based on the two indicators of education and employment. We refer to the algorithm of QS World University Employment Competitiveness Ranking, and we note that salary is also an important criterion. Based on these two standards, we will give a more reasonable evaluation system. We multiply the factor of QS World University's employment competitiveness by a factor of 0.7, and the salary factor accounts for the other 30% of our evaluation criteria. Then it should be

- Reputation of the employed company (Integer) 21%
- Alumni Performance (Integer) 10%
- Relations between the colleges and employers (Integer) 4%
- Employment rate (Float) 7%

- Average salaries (Float) 10%
- Salaries standard among peers in the same major (Float) 20%
- Remark given by peers in the same major (Integer) 14%
- Remark given by the employers (Integer) 14%

e) Class: Department

The department class will be given four input indexes:

- Department Name (String)
- Department ID (String)
- Department Education (Class)
- Department Employment (Class)
- Rank (Int)

And thirteen functions will be applied in this class.

- SetDep() is used to set class department information.
- GetDep() is used to get class department information.
- GetName() is used to get department name.
- SetName() is used to set department name.
- SetId() is used to set department ID.
- GetId() is used to get department ID.
- SetEducation() is used to set education condition of each department.
- GetEducation() is used to get education condition of each department.
- SetEmployment() is used to set employment condition of each department.
- GetEmployment () is used to get employment condition of each department.
- Ranking() is used to assess each departments` performance in education and student development.

These indexes Department ID and Department Name will be linked into a corresponding array list, like [COE, 01].

The evaluation method, Ranking(), will be given by Apriori Algorithm. In Wikipedia, "Apriori is an algorithm for frequent item set mining and association rule learning over relational databases. It proceeds by identifying the frequent individual items in the database and extending them to larger and larger item sets as long as those item sets appear sufficiently often in the database. The frequent item sets determined by Apriori can be used to determine association rules which highlight general trends in the database: this has applications in domains such as market basket analysis." This will provide us with a relationship between courses and determine the prerequisite courses for each course. At the same time, we can give the recommended course combination accordingly.

f) Class: Admin

The admin class will be given three input indexes:

- Name (String)
- ID (String)
- Department (Class)

The name and the ID means the admin name of each department. The admin class

is used for storing the admin information of each department. And the (dep)Department is used for using the data that the department class stored.

And eight functions will be applied in this class.

- GetName() is used to get admin name.
- GetEmploy() is used to get emoloyment.
- SetEmoloy (Employment emp) is used to set emoloyment.
- SetDep(Department) is used to set class department information.
- GetDep() is used to get class department information.
- SetEducation (int major,int employ) is used to set class education information.
- SeStudent(Student stu) is used to set class student information.
- GetStudent() is used to get class student information.

g) Class: User

The user class will be given three input indexes:

- Uid (String)
- Password (String)
- Utype (String)

And three functions will be applied in this class.

- GetType() is used to get type name.
- GetUid(): is used to get user id.
- GetDepinfo(): is used to get department information.

h) Class: Grade

The grade class will be given three input indexes:

- CourseName(String)
- CourseId (String)
- Tech (Teacher)
- Grade (Float)

And two functions will be applied in this class.

- GetGrade() is used to get Grade.
- SetGrade() is used to set Grade.

i) Class: Teacher

The teacher class will be given four input indexes:

- Tech_name (String)
- Tech_id (String)
- Tech_Dep (Department)
- Tech_CourseId (List)

The teacher class is given the information of teachers. It contains teacher's name, teacher's id, which department teacher belong and the course teacher teach.

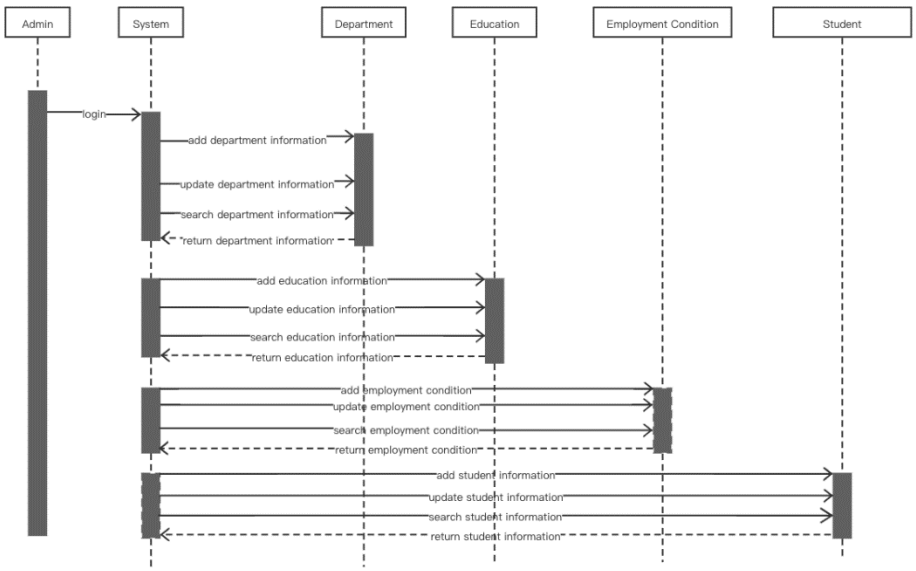
And ten functions will be applied in this class.

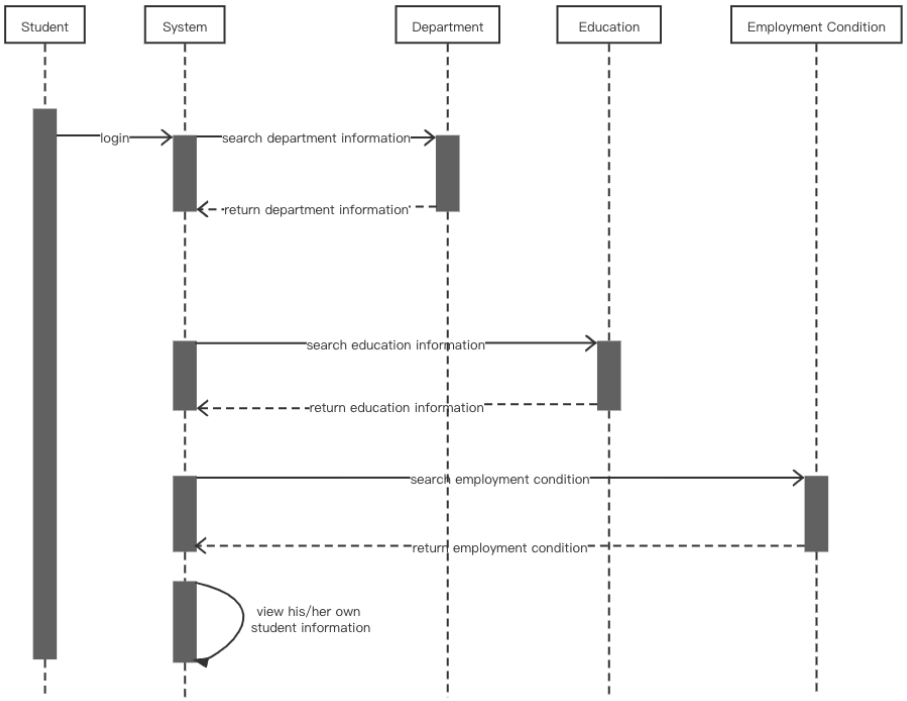
And nine functions will be applied in this class.

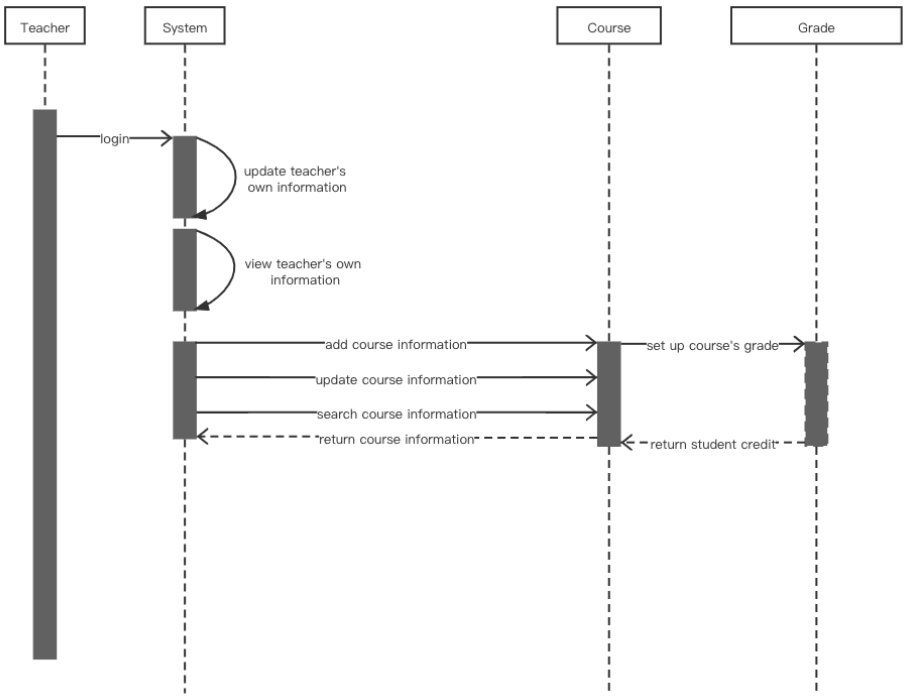
- GetName(): is used to get teacher's name.

- SetName(): is used to set teacher's name.
- GetId(): is used to get teacher's ID.
- SetCourse(Course): is used to set course.
- GetCourse(Course): is used to get course.
- SetDep(Department): is used to set Department.
- GetDep(Tech_id): is used to get which department teacher belongs.
- AddGrade(Grade): is used to add grade.
- UpdateGrade(): is used to undate Grade.

2. Sequence Diagram




Student
System
Department
Education
Employment Condition
login
search department information
return department information
search education information
return education information
search employment condition
return employment condition
view his/her own
student information


Teacher
System
Course
Grade
login
update teacher's
own information
view teacher's own
information
add course information
update course information
search course information
return course information
set up course's grade
return student credit

3. Class Diagram