TOPIC 1.

MANAGEMENT OF TEACHING AND ACADEMIC ADVISORS

The university wants to manage the amount of work that lecturers are assigned. It has numerous faculties, and each one is in charge of managing many lecturers.

The Department of Organization is responsible for managing the curriculum vitae of the lecturers. One lecturer's curriculum vitae includes the following attributes: lecturer's ID, full name, and teaching title. Lecturer salaries are based on their teaching titles, and each title has a corresponding title coefficient.

The lecturers may also teach in other training institutions in other provinces or towns in addition to their usual duties at the university. Classes are differentiated depending on the institution's name, admission year, and major name. For instance, "Math Pedagogy 2010" is a class in the regular education system, and "Informatics Vinh Long 2010" is a class in the service education system. Each class only belongs to the education system. The classes in the university belong to the regular education system, whilst the classes taken elsewhere are part of the service education system.

A lecturer may teach the same subject to many classes and a variety of subjects to various classes throughout the classes of the semester. The property of the subject determines how teaching hours are converted. For theoretical subjects, one hour is equal to one standard hour. Each practical subject hour is equivalent to one-half of a standard hour.

The lecturer of that class is entitled to a teaching coefficient based on the number of students in the class. The teaching coefficient increases with class size. The coefficient is 1 if there are fewer than 80 students, 1.2 if there are 80 to 139 students, and 1.5 if there are 140 to 179 students. The number of standard hours in instruction is determined using this coefficient.

Creating research topics, supervising, and assessing (commenting and marking) the projects and annual theses are additional responsibilities of the lecturer. According to the regulation, a thesis or project's conversion of supervising hours relies on the kind of the project and thesis. Each kind of project and thesis corresponds to a corresponding number of credits. The project for the subject earns two credits, the graduation project four credits, and the graduate thesis twelve credits. Each project or thesis supervisor is given six standard hours per credit. The reviewer received three standard hours for reviewing the graduation project and five standard hours for reviewing the thesis.

Additionally, lecturers will receive 20 standard hours per class per semester if they are assigned to serve as the academic advisor for one regular class. There is just one lecturer who serves as an academic advisor for a class each semester.

The lecturer announces the amount of work completed over the academic year at the end of the second term. Summary, verification, and submission of reports to the Department of Academic Affairs for use in determining lecturers' salaries are the faculty's responsibility.

TOPIC 2.

BUILDING A CUSTOMER INFORMATION AND SERVICES MANAGEMENT SYSTEM OF THE YOUTH FITNESS CENTER

Final examination; Semester: 2; Academic year: 2018-2019

The Youth Gym-Yoga-Fitness center wants to manage customer information and services. The system includes the following functions:

1. **Manage Practical Subjects and Services:**

- The Center provides for customers with:
  - many Practical Subjects (Gym, Yoga, Fitness, Dance, Weight-Loss...). Each practical subject has information as Practice Subject ID, Practice Subject Name, Room, Timetable, and belongs to a service.
  - many Services (1 month, 3 months, 6 months, 12 months, Personal Training...) with different total training hours and costs. The system stores information of each service as Service ID, Service Name, #Month, Personal Training, Training Hour, and Cost.
- The General Managers (GM) are allowed to insert, delete, and update information about Practical Subjects and Services. Before performing the updating or deleting operation, the General Manager uses the search function in order to select suitable information.

2. **Manage customer information:**

- Once a learner wants to be a member of the center: First, he/she has to give information to an employee as Name, Gender, Date of Birth, Phone, Email, and Address. Then, an employee inserts the new member information. Employees are also allowed to insert, update or delete membership information. When updating/deleting membership information, employees can use the search function in order to select suitable information.

3. **Register for a class:**

- In order to register for a class with Practical Subject and Service (for example the class: Yoga with Personal Training in 1 month), the member needs to give information to an employee as Customer ID, Customer Name, Practical Subject, Service, Start date. Based on the given information, the system displays the cost of registration. After paying, the system stores information on class registration. During registration, employees can use the search function to get suitable information.

- When the service expires, the employee can renew the customer or register for a new service. The employee can also suspend service upon request or re-enable the service when the customer goes back to practice.
- When registering successfully, customers will be issued with a service card. Customers will swipe this card into the card reader, the system will store the customer's practice time.

4. Others:

- General managers are also allowed to insert, delete, and update information about employees and trainers.
- The system provides statistical and reporting functions, such as the number of customers by subject or by day, and revenue reporting by day, month, and year.

Note: Employees and General managers have to log in to the system before performing offered functions.

TOPIC 3.

BUILDING A MANAGEMENT SYSTEM OF THE YOUTH BOOKSTORE

Final examination; Semester: 2; Academic year: 2019-2020

The Youth bookstore wants to build an information system including the following functions:

1. **Manage book:**

- The bookstore provides customers with many books. Each Book includes the following information: Book ID, Title, Publisher, Year of Publication, Book Description, Category, Number of Pages, Price, and Stock (quantity available for sale).
- Employees are allowed to insert, delete, update, and search for information about books. When updating or deleting book information, employees use the search function to select suitable information.
- Note: The stock of each book is automatically updated by the system when the bookstore imports or sells books.

2. **Manage supplier:**

- The bookstore imports books from suppliers. Information about each supplier includes Supplier ID, Supplier Name, Address, Phone, Email, Bank Account, and Tax Code.
- Employees can insert, delete, update, and search supplier information. When updating / deleting supplier information, employees use the supplier search function to select suitable information.

3. **Book import process:**

- When importing books from a supplier, an employee makes a Book Entry with the following information: Book Entry ID, Date of Book Entry, Employee (the employee is responsible for importing the book), Supplier, Book Entry Details (Book ID, Book Title, Quantity, and Import Unit Price), and Amount of the book entry. Each book entry can import many books. The system also updates the stock.
- Employees can insert, delete, update, and search book entries. When updating/deleting book-entry information, employees use the book-entry search function.

4. **Book sales process:**

- Once a customer has selected books and requested payment, an employee creates an Invoice with the following information: Invoice Code, Date of Invoice, Employee (the employee is responsible for creating the invoice), Invoice Details (Book ID, Book Title, Quantity, and Sale Unit Price), and Amount of the invoice. Each invoice can include many books. The system also updates the stock.

- Employees are allowed to insert, delete, update, and search invoices. When updating/deleting invoice information, employees use the invoice search function.

Note: Employees have to log in to the system before performing offered functions.

TOPIC 4.

REGISTRATION SYSTEM
OF THE "IDEAS INTO STARTUPS CONTEST"

The Youth University wants to build the registration system of the ***"Ideas into Startups Contest"*** *as follows:*

1. Plan the contest:

- At the beginning of each season of the ***"Ideas into Startups Contest"***, a Youth Union staff makes a plan including rounds. Information of each round includes Round ID, Round Name, Start Day, End Day, Number of Team, and Description.
- The Vice-Rector has to approve the plan before announcing it on the website. The system allows Youth Union staff to insert, delete, update and search round information. When updating or deleting round information, staff can use the search function to select suitable information.

2. Registration process:

- Once a team wants to register for the contest: Firstly, the Team Leader needs to log in to the system using his/her student account. Then he/she registers for the contest by inputting into the system information of the team as Team ID, Team Name, Number of Member, Phone, Email, Faculty, and Coach (at this time, Coach has NULL value). Besides, the team leader also has to input information of all of the team members including Student ID, Student Name, Phone, and Email. Each team can include a maximum of 3 students.
- The team leader can also update his/her team information. When updating team information, the team leader can use the team's profile display function to select suitable information.
- When the registration period expired, Organizing Committees (OCs) review the team's profile to select an official team. Each team receives accepted or rejected registration information via both email and the website.

<u>Note</u>*: Youth Union staff, Vice-Rector, Team Leader, and Organizing Committees (OCs) have to log in to the system before performing offered functions.*

- Question 1 (3.0 scores) Create a use-case model of the system.
- Question 2 (2.0 scores) Create an activity diagram of the "Register for the contest" use case.
- Question 3 (2.5 scores) Create a class diagram of the "Register for the contest" use case.
- Question 4 (2.5 scores) Create sequence diagrams of the "Register for the contest" use case.

TOPIC 5.

MANAGEMENT SYSTEM OF THE REGISTRATION PROCESS FOR CONTESTANT (PLAYER) OF THE VOICE GAME

The Youth Media Ltd. wants to manage the registration process for the contestant (player) of the voice game show as follows:

1. Plan a voice game show:

At the beginning of each season of the voice game show, the Planning Department (PD) makes a plan including:

- Make a list of coaches. Information of each coach is: Coach ID, Coach Name, Gender, and Strength
- Schedule time for 3 rounds: blind auditions, knockouts, and live performance shows. Each round includes information such as Round ID, Round Name, #Max Contestant (or #Max Player), Start Date, End Date, and Description.

The General Manager has to approve the plan before announcing it on the website. The system allows PD staff to insert, delete, and update information related to coaches, schedules of rounds. Before performing the update operation or deleting operation, the user looks up the corresponding information list.

2. Manage registration:

Once a contestant (player) wants to register for the game show: Firstly, he/she needs to register an account to access the system via the website. Then, the contestant logs in to the system and registers for the game show. The system stores information of contestants as Contestant ID, Full Name, Date of birth, Gender, Address, Phone Number, Email, Hobby, and Coach (at this time, Coach has NULL value).

The contestant can also update his/her information. Before performing the update or deleting information, the contestant uses the search function to select suitable information.

When the registration period expired, Organizing Committees (OCs) review the contestants' profiles to select official contestants. All contestants receive accepted or rejected registration information via both email and website.

<u>*Note*</u>*: Planning Department staff, Organizing Committees (OCs), and General Manager has to log in to the system before performing offered functions.*

Question 1 (3.0 scores)

Create a use case model of the system.

Question 2 (2.0 scores)

Create an activity diagram of the **“Manage registration”** use case.

Question 3 (2.5 scores)

Create a class diagram of the **“Manage registration”** use case.

Question 4 (2.5 scores)

Create sequence diagram (includes Actor, User Interface object, Controller object, and Entity object) of the **“Manage registration”** use case.

TOPIC 6.

THE REGISTRATION MANAGEMENT SYSTEM FOR THE ENGLISH DEBATE CONTEST

Final examination - Semester: 2; Academic year: 2021-2022

The Youth English center wants to build a Registration management system for the English debate contest as follows:

1. Make plan:

- At the beginning of each year, an employee will make a plan for the contest of the year, including: Contest Code, Main topic, Start date, End date, Exam fee, Maximum number of team, and Awards.
- The plan has to be approved by the Manager before being published. After the plan is approved, they will publish the contest plan on the website.
- Employee and Manager are allowed to insert, delete, update, and search information about plans. When updating or deleting plan information, they use search function in order to select suitable information.

2. Manage team:

- The contest has many teams, each team includes 3 debaters. The center stores information about each team including Team Code, Team Name, List of members, Team leader, and belongs to a Contest. Information of each debater includes Debater ID, Full Name, Date of Birth, Phone, and Email.
- During registration time, teams are allowed to register for the contest in case of the number of registered team is smaller than the maximum number of team as planned. The process is as follows:
  - Team leader performs registration on the website, including input information about the team, and debaters, then pays the contest fee.
  - About debaters:
    - In case of old debater (The person participated in previous debate contests) or a student at the center, team leader will select information from the system.
    - In case of new debater, team leader inputs new debater information.
  - Payment methods are bank transfer or e-wallet
  - Team leader confirms information and submits.

  - Once the verification system has received the contest fee, the system sends the team leader a successful registration email.
- In addition, employee can also support team leader to register using the employee account. The process is the same as how the team leader registers his team. In this situation, team leader can pay in cash, bank transfer, or e-wallet.
- Employee and team leader are allowed to insert, delete, update, and search information during registering. When updating or deleting information, they use search function in order to select suitable information.
- Employee and manager can view reports / statistics on registered debate teams, and amount of contest fee.

Note: *Employees and managers have to login the system before performing offered functions.*

Question 1 (3.0 scores) Create use case model of the system.
Question 2 (2.0 scores) Create activity diagram of the "*Register debate team*" use case.
Question 3 (2.5 scores) Create sequence diagram of the "*Register debate team*" use case.
Question 4 (2.5 scores) Create class diagram of the "*Register debate team*" use case.

Additional functions:

- Manage employees: Manager can insert, update, delete and search employee information. When updating/deleting employee information, manager can use the search function in order to select suitable information.
- Managers are also allowed to manage teams.