BACS2033 Software Requirements Engineering

Tutorial 3

Chapter 3

1. Discuss any 4 common dimensions of requirements classification.

2. State the 4 types of conceptual models that discussed in lecture. Briefly discuss the usage and example(s) of each type.

3. Discuss why should we perform requirements allocation?

4. The ABC bank provides a cash deposit machine for their customers to carry out a bill payment, transfer fund and deposit cash at any time. The system has the following *functionalities*:

    *   Verify deposited notes.
    *   Deposit cash
    *   Transfer fund bank
    *   Reject notes
    *   Pay utility bill
    *   Verify payee account
    *   Generate receipt

    Analyze the above scenario and construct a *use case diagram* that depicts the functional requirements for the cash deposit machine. You are required to add <<include>> or <<extend>> relationship in your diagram.

5. The customer is allowed to place bus tickets reservation based on the bus schedule availability via online. If the bus schedule is available, the system will check the seat availability. If the seat is available, the system will request customer's personal details. The system will check the customer's status. If he or she is a new customer, the system will register the customer details into the system; else the customer can proceed to make the reservation.

    Once the reservation transaction is done, the system will display the total amount payable and the customer should make online payment one day before the departure date and time; else the system will automatically cancel the reservation. Once the payment transaction is done, the system should be able to generate the online ticket receipt and the customer is required to print out the receipt as a proof.

    Based on the case given above, construct a suitable *use case diagram* for the Online Bus Tickets Reservation System. Your use case diagram should include the following system functionalities:

    *   Register new customer
    *   Reserve bus tickets
    *   Cancel reserved tickets
    *   Make online payment
    *   Generate online ticket receipt
    *   Check the availability of schedule
    *   Check payment status

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6. Construct an *analysis class diagram* based on the following description:

   A customer can track the parcel location via online by entering the shipment code. There are two types of customers: individual customer and corporate customer. The shipment details such as shipment code, shipment date, shipment status and etc. will be stored in the system. The customer is allowed to claim compensation for damaged items.

   The *analysis class diagram* should include entity classes with appropriate attributes, association, generalization and multiplicity of the associations.

7. Construct a relevant UML Class diagram to show **aggregation** or/and **composition** for the following:

   An email inbox has many incoming emails daily. Each email has a header, a body and optionally it may consist of one or many attachment files.

8. The examination center of ABC College releases the students' results at the end of each semester.

   The students can proceed to the next semester if they pass all the subjects for that semester and the student's status is "normal". If the students fail 2 or more subjects, they cannot proceed to the next semester and the student's status is "repeat". However, if students failed only 1 subject, they can take the special examination that will be held 2 weeks time after the results are released and the student's status is "resit". Finally, if the students did not pay the school fees for that semester, they will automatically be withdrawn from their programme.

   Based on the scenario described, draw a *state chart diagram* for the **Student** class. Your state chart diagram should include relevant states, events, guard conditions and show the state transitions.

9. Draw a *state chart diagram* for a **Book** class based on the following description:

   A book is available on the shelf in library. When a member borrows a book, the book's state is on loan. Members can reserve books that are on loan. When the book is returned on time, the member who reserved the item can then borrow it.

   Your state chart diagram should include relevant states, events, guard conditions and show the state transitions.

10. Assume that you, as a project manager, are considering to adopt either Viewpoint-Oriented Analysis method or Object-Oriented Analysis method in requirements gathering and analysis for a project.

    a) Describe Viewpoint-Oriented Analysis in the requirement analysis process.

    b) Evaluate the use of Viewpoint-Oriented Analysis method in requirements gathering and analysis.

    c) Discuss the main tasks involved in Object-Oriented Analysis.

    d) Suggest and briefly explain 2 approaches to identify objects and classify of objects.