Software Design and Analysis

CS-324

Class Diagram

Lecture # 19,20, 21
12,14,17 Oct

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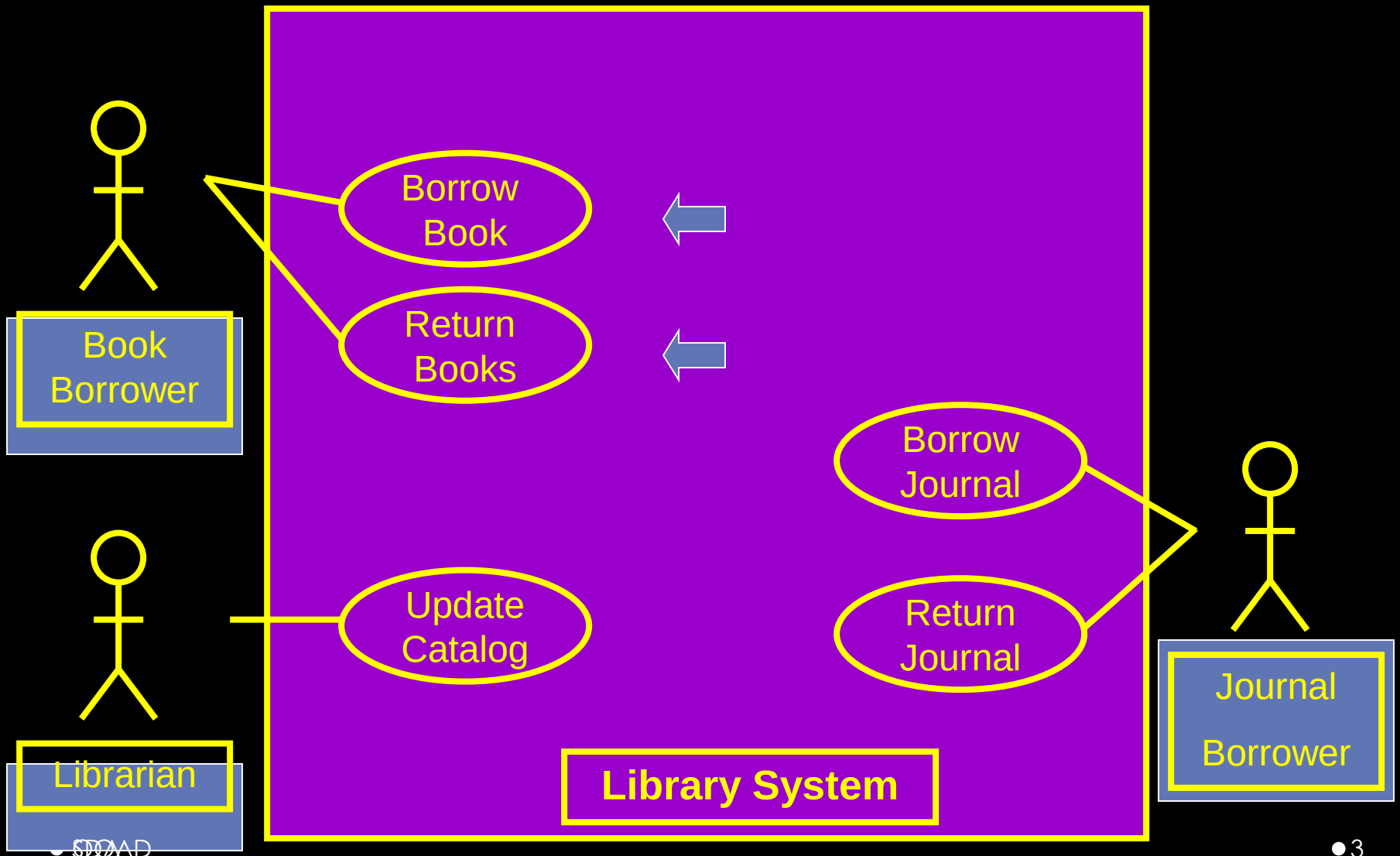
Today's Outline

- Lab
- Exercises
- Quiz
- Revision(Mid1)

Use Diagram for a Library System



Exercise

- Draw a class diagram of a campus library management system. Attributes of library include name, phone number. Library contains books and journals that can be added or removed form the library.
- Each book and journal has an id, name, author name and publisher.
- Library member can issue and return the book.
- Library member can be student or staff. Students can issue 4 books at a time and staff can have 8 books.
- Journals are available for staff only.

Exercise

- We have to develop an application that model different kinds of vehicles such as bicycles, motor bike and cars. All Vehicles have some common attributes (speed and colour) and common behavior (turnLeft, turnRight). Bicycle and MotorVehicle are both kinds of Vehicle. MotorVehicles have engines and license plates. MotorVehicles includes two types i.e. MotorBike and Car.

Exercise

- **University Team Management**
- In the OOAD course at Fast University, students are member of teams.
- Each team has 2 or 3 members.
- Each team completes 0 to 3 assignments.
- Each student takes exactly two midterm test.
- Computer Science students have a single account on Coding Development facility , while each engineering student has an account on the Engineering facility.
- Each assignment and midterm is assigned a mark.

Exercise

- **University System:**
- FAST university offers degrees to students.
- The university consists of faculties each of which consists of one or more departments.
- Each degree is administered by a single department.
- Each student is studying towards a single degree.
- Each degree requires one to 20 courses.
- A student enrolls in 1-5 courses (per term).
- A course cab be either graduate or undergraduate, but not both.
- Likewise, students are graduates or undergraduates but not both.

Exercise

- We have to develop a banking system application which provides many services to the customers like opening and closing accounts, balance enquiry, deposit money, cash withdrawl, and taking cards. Customer can open two types of accounts i.e. saving and current account. Bank also has an ATM machine which provides the services related to balance. Customer can take loan from the bank against his/her account. One customer can take only one loan at a time.

Your Turn: Exercise

- Draw the UML **class diagram** showing the domain model for online shopping. The purpose of the diagram is to introduce some common terms, "dictionary" for online shopping - Customer, Web User, Account, Shopping Cart, Product, Order, Payment, etc. and relationships between. It could be used as a common ground between business analysts and software developers.
- Each customer has unique id and is linked to exactly one **account**. Account owns shopping cart and orders. Customer could register as a web user to be able to buy items online. Customer is not required to be a web user because purchases could also be made by phone or by ordering from catalogues. Web user has login name which also serves as unique id. Web user could be in several states - new, active, temporary blocked, or banned, and be linked to a **shopping cart**. Shopping cart belongs to account.
- Account owns customer orders. Customer may have no orders. Customer orders are sorted and unique. Each order could refer to several **payments**, possibly none. Every payment has unique id and is related to exactly one account.
- Each order has current order status (new, hold, shipped, delivered, closed). Both order and shopping cart have **line items** linked to a specific product. Each line item is related to exactly one product. A product could be associated to many line items or no item at all.

That is all