Examples

Object Orientated Analysis and Design

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Outline

- Revision Questions
- Group Project
  - Review Deliverables
- Example System Problem
  - Case Studey

Milestone Dates

- Demonstrate Date
- Submission Deadline

- Exam 28th Dec - 4th/Jan
  - ▷2 Hours
  - ▷NOT Multiple Choice

Case Study Problem

Design Library Management System

Operation

Step 1

- Provide a user interface for getting the user's login details
- Verify login ID and if correct, provide access to the library database

Step 2

- Provide a search mechanism to search for a particular book
- Input the book name and author's name

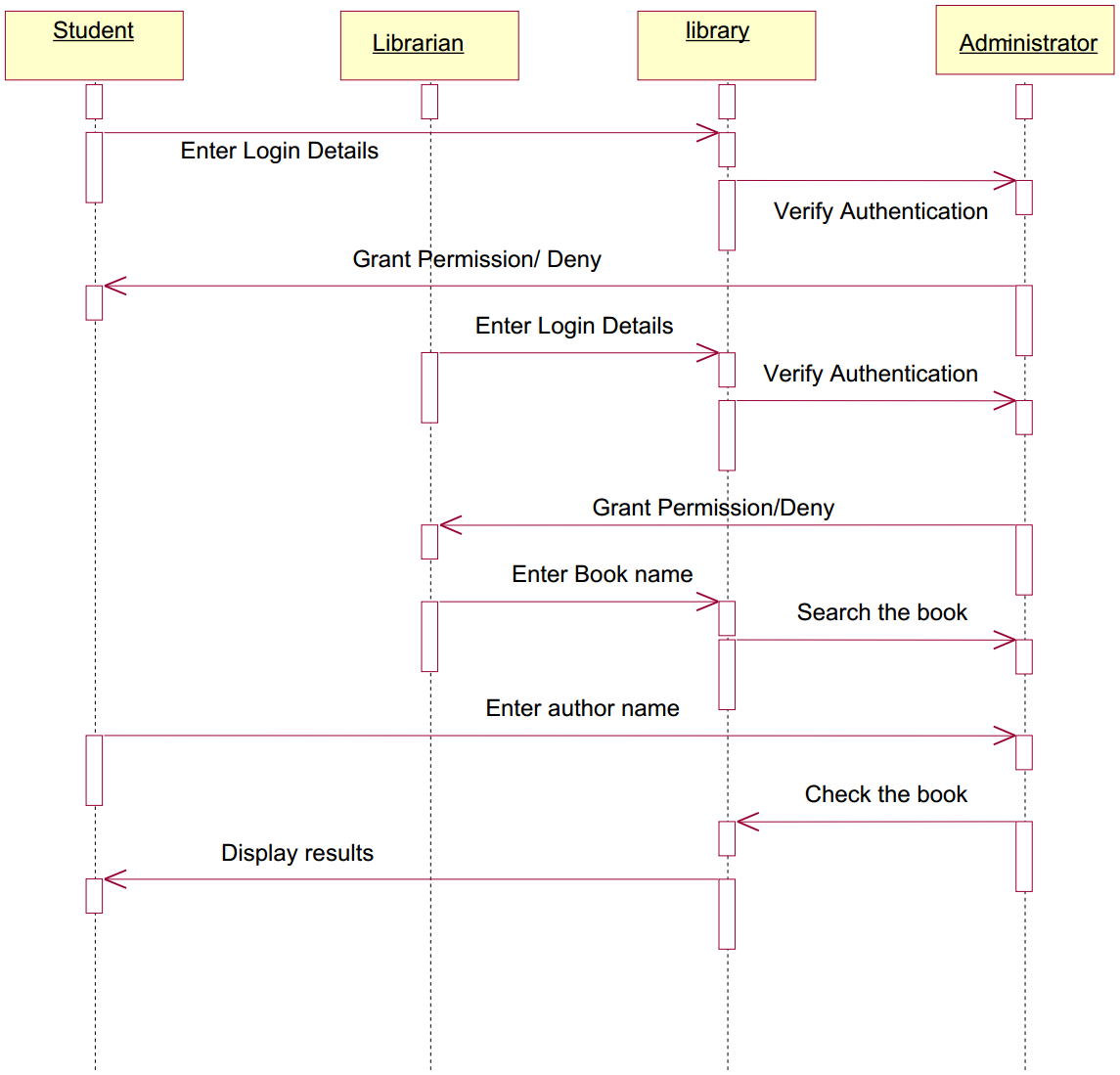
Step 3

- Get the book details from the database
- Display the book details on screen

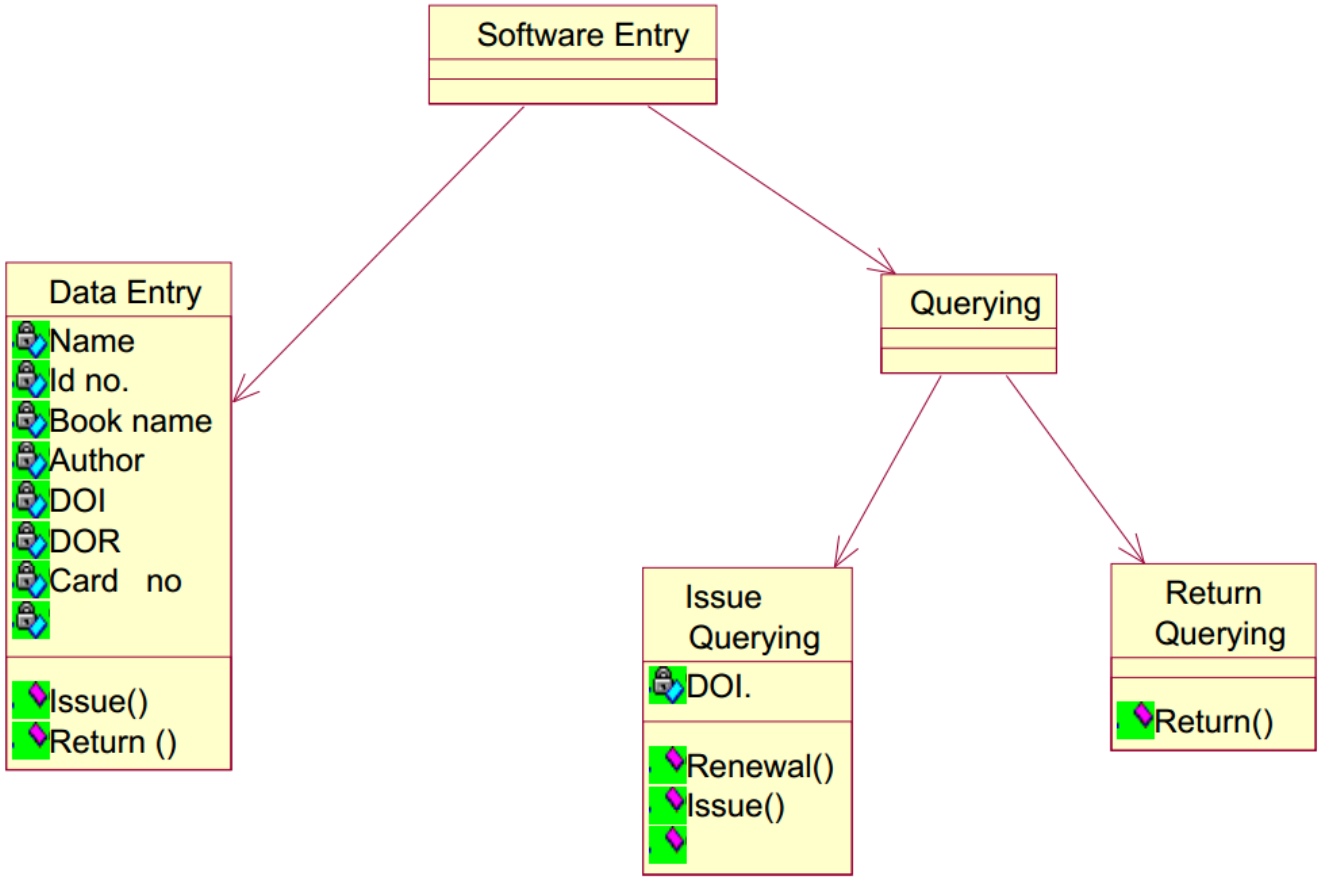
Step 4

- Allow the user to select the book for checking out
- Issue the book

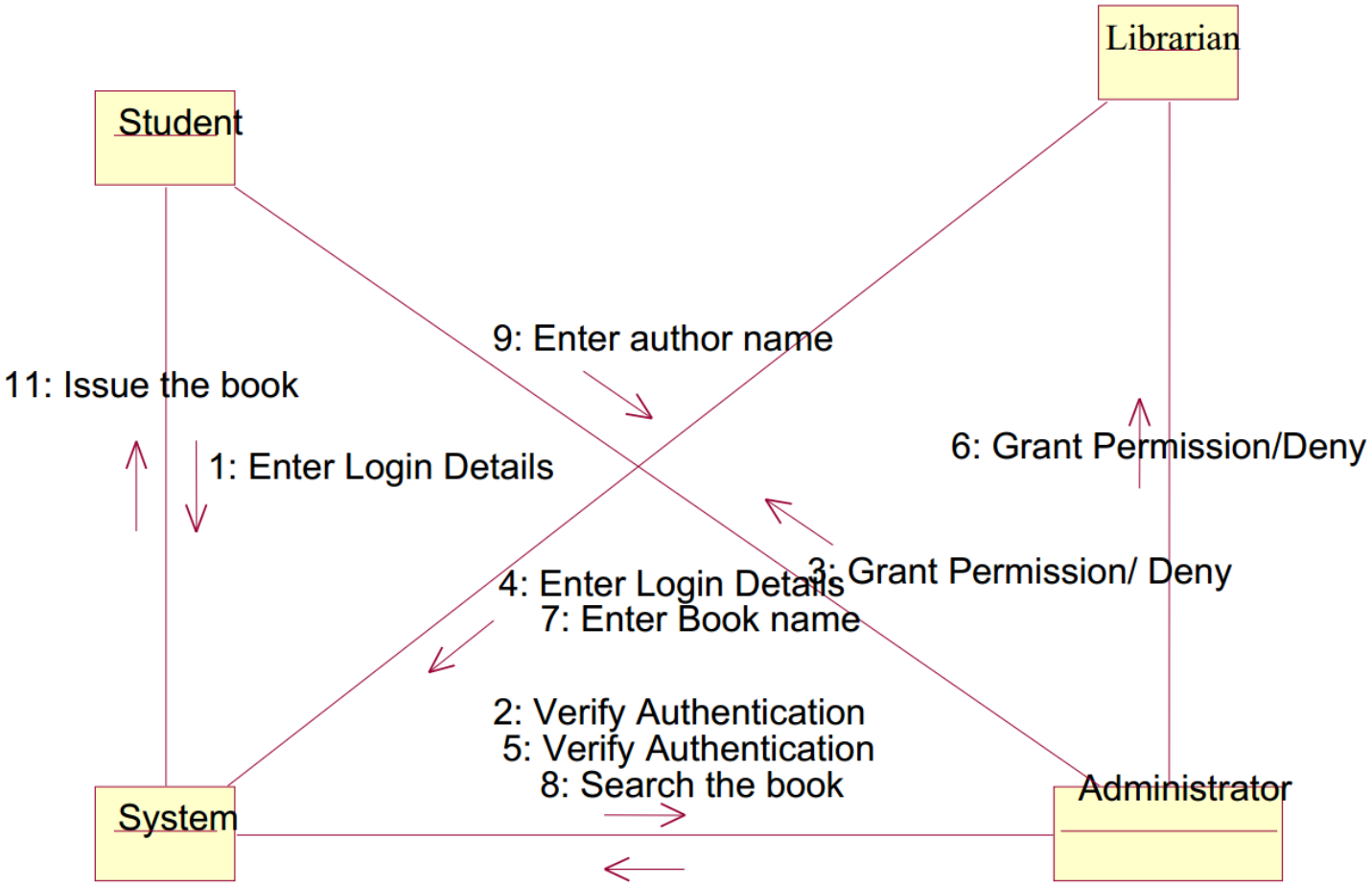
Sequence Diagram



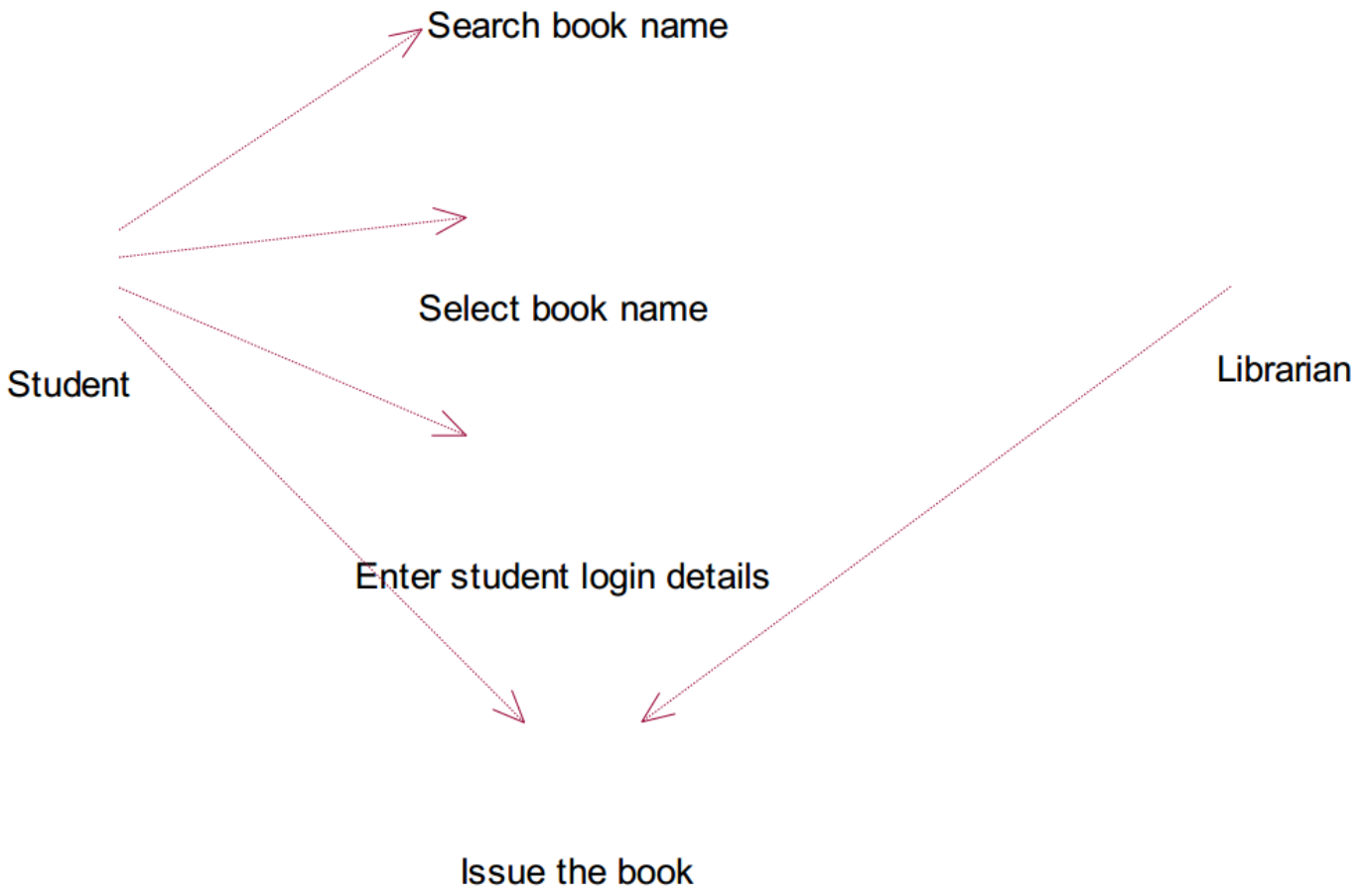
Class Diagram

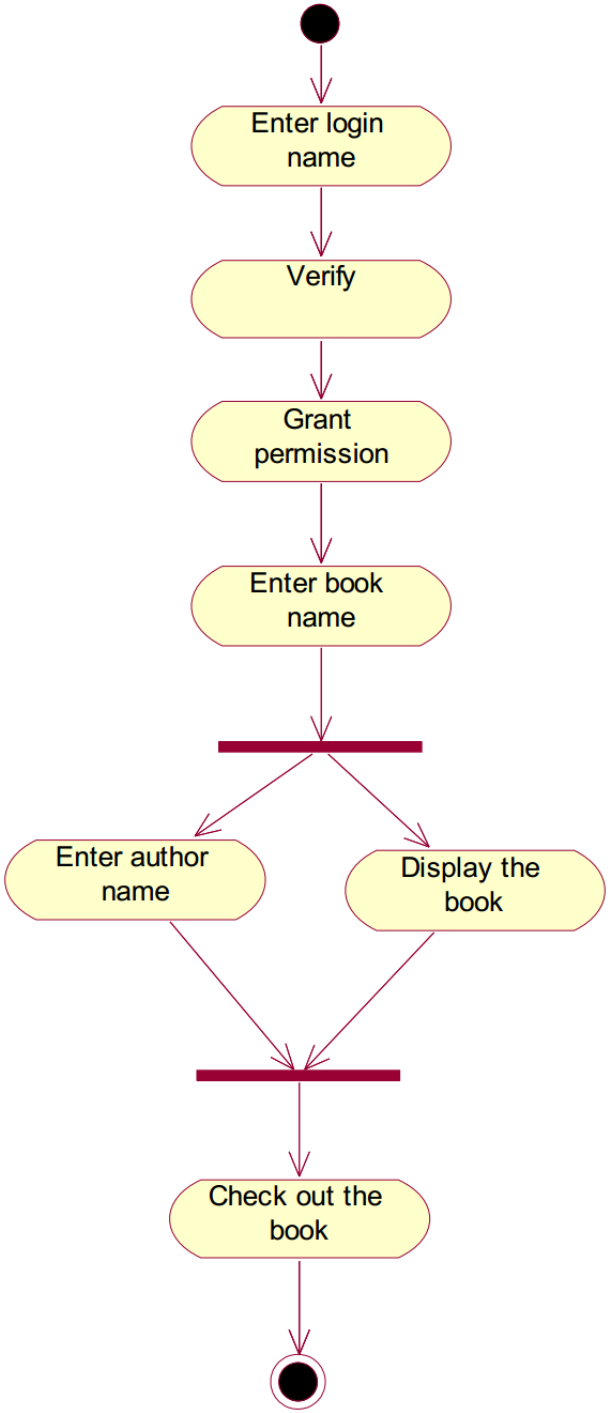


Collaboration Diagram



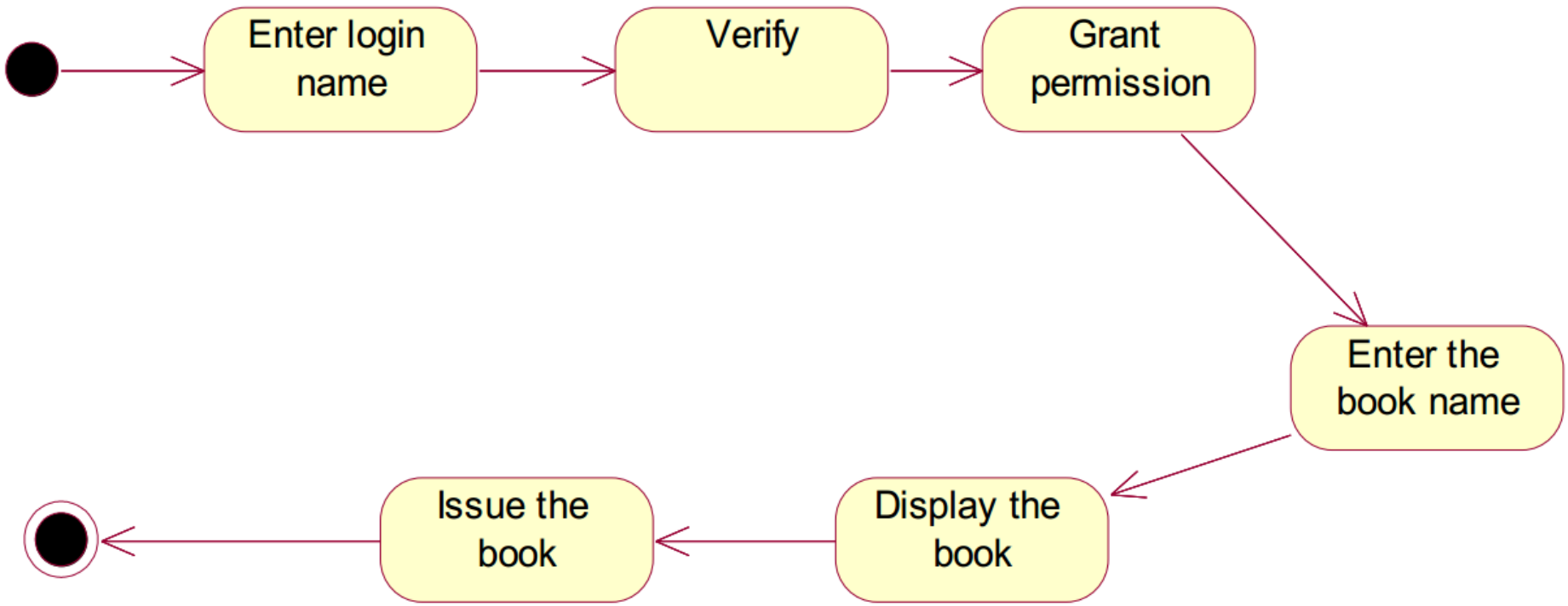
Use Case Diagram



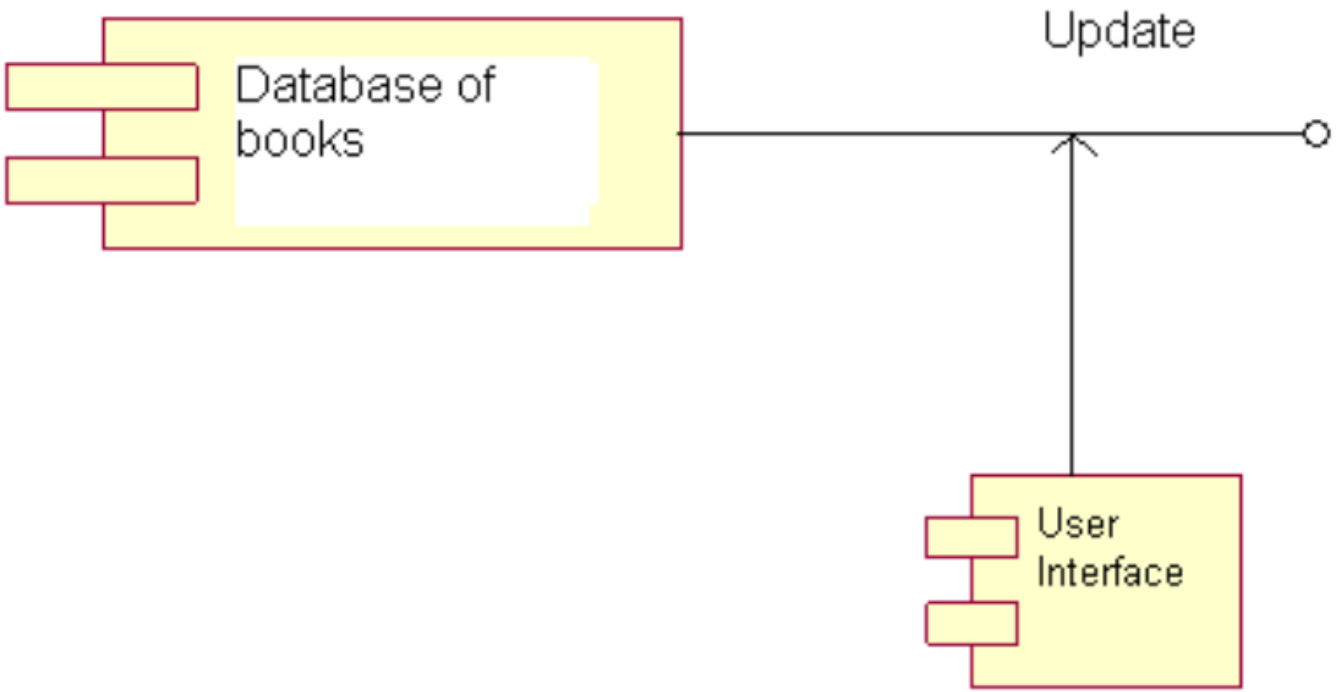


Activity Diagram

State Chart Diagram



Component Diagram



Deployment Diagram

Testing/Validation

- Library Management System would be verified and validated against the original design specification

Question

- Briefly summarize the importance of using inheritance

Answer

- Inheritance is one of the most powerful features of object oriented programming. Most important advantages of inheritance are:
- Reusability
- Saves times and efforts
- Closeness with the real world
- Easy modification
- Transitive Nature of inheritance

Question

- What do you mean by overloading of a function? When do you use this concept? Give an example of function overloading?

Answer

- Function overloading is a technique where several function declarations are specified with a same name that can perform similar tasks, but on different data types (distinguished by their number and type of arguments)

- Example

```
int add (int a, int b);
int add (int a, int b, int c);
float add (float a, float b);
```

Hence, overloaded functions perform different activities depending upon the kind of data sent to them

Question

- List the difference between Polymorphism and Overloading?

Answer

Polymorphism

Polymorphism is an important concept of OOPS.

Polymorphism means ability of one object to take many different forms.

Two main types of polymorphism:

Runtime polymorphism

Compile time polymorphism

Overloading

Overloading is the mechanism to implement polymorphism.

Overloading is the mechanism to use the same thing for different purposes.

Question

- Which development approach is the waterfall model?

a) incremental development approach

b) iterative development approach

c) static development approach

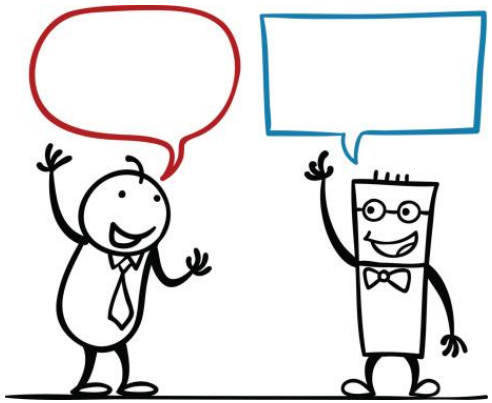
d) behavioral development approach

Answer

- a) incremental development approach

Question

- What are the four lifecycle phases for SCRUM?



Answer

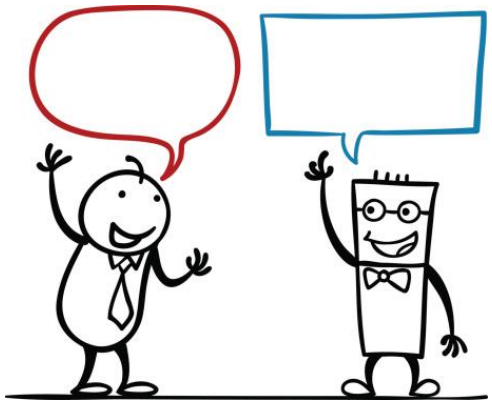
- SCRUM lifecycle includes four phases:

1. *Planning*
2. *Staging*
3. *Development*
4. *Release*

Question

- Write down the differences between Agile and Plan-Driven development

  (5 Minutes)



Agile

- Project is small
- Experienced teams with a wide range of abilities take part
- Teams are self-starters, independent leaders and others who are self-directing
- Project is an in-house project and the team co-located
- System is new with lots of unknowns
- Requirements must be discovered
- Requirements and environment are volatile with high change rates
- End-user environment is flexible
- Relationship with customer is close and collaborative
- Customer is readily available dedicated and co-located
- High trust environment exists within the development teams and customer
- Rapid value and high-responsiveness are required

Answer

Plan-Driven

- Project is large
- Teams include varied capabilities and skill sets
- Teams are geographically distributed and/or outsourced
- Project is of strategic importance
- System is well understood (scope and features set)
- Requirements are fairly stable
- System is large and complex (critical safety/high reliability requirements)
- Project stakeholders have a weak relationship with the development team
- External legal concerns
- Focus is on a strong, quantitative process improvement
- Definition and management of process are important
- Predictability and stability of process are important

Summary

- Case Study
- Example Problems/Solutions
- Review Questions

This Week

- Review Slides
- Coursework
- Reviewing Quiz Questions
- Reviewing Associated Chapter

Questions/Discussion