Examples

Object Orientated Analysis and Design

Benjamin Kenwright

Outline

- Revision Questions
- Group Project
  - Review Deliverables
- Exam/Quizzes/Project Dates
- Example System Problem
  - Case Studey

Milestone Dates

- Demonstrate Date
- Submission Deadline

- Exam 3rd Jan 2017
  - ▷2 Hours

25th

December

Last Day – Quizzes

Grade Taken

Group Project

- Report
- Submission Date 25th December
- Presentation/Demonstration
- Marking Criteria/Deliverables

Submit single .zip

Student number, e.g., 20939302.zip

Report and any supporting material

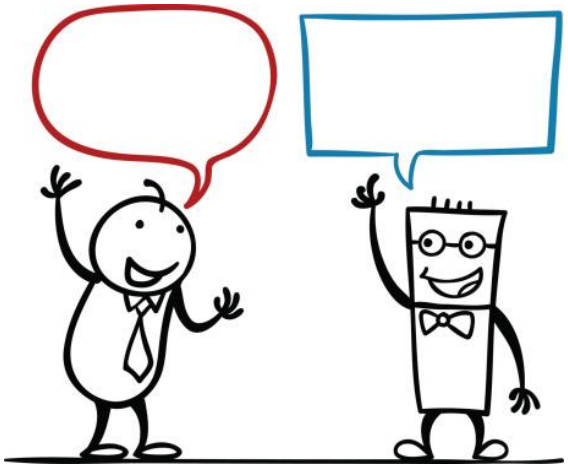
Case Study Example

Online Ticket Reservation System

Exercise

- Write down the steps you'd go through for a Online Ticket Reservation System

  (5 Minutes)

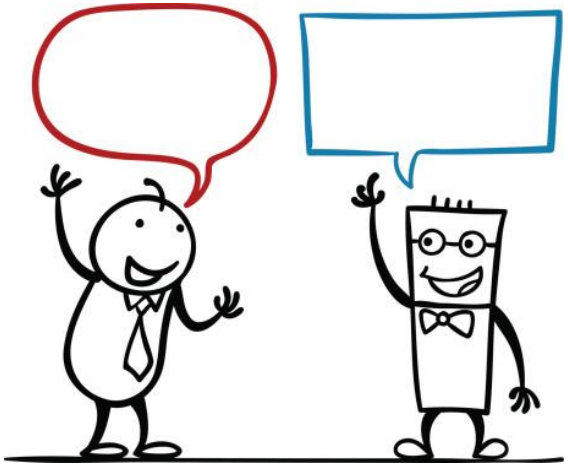


Example Steps

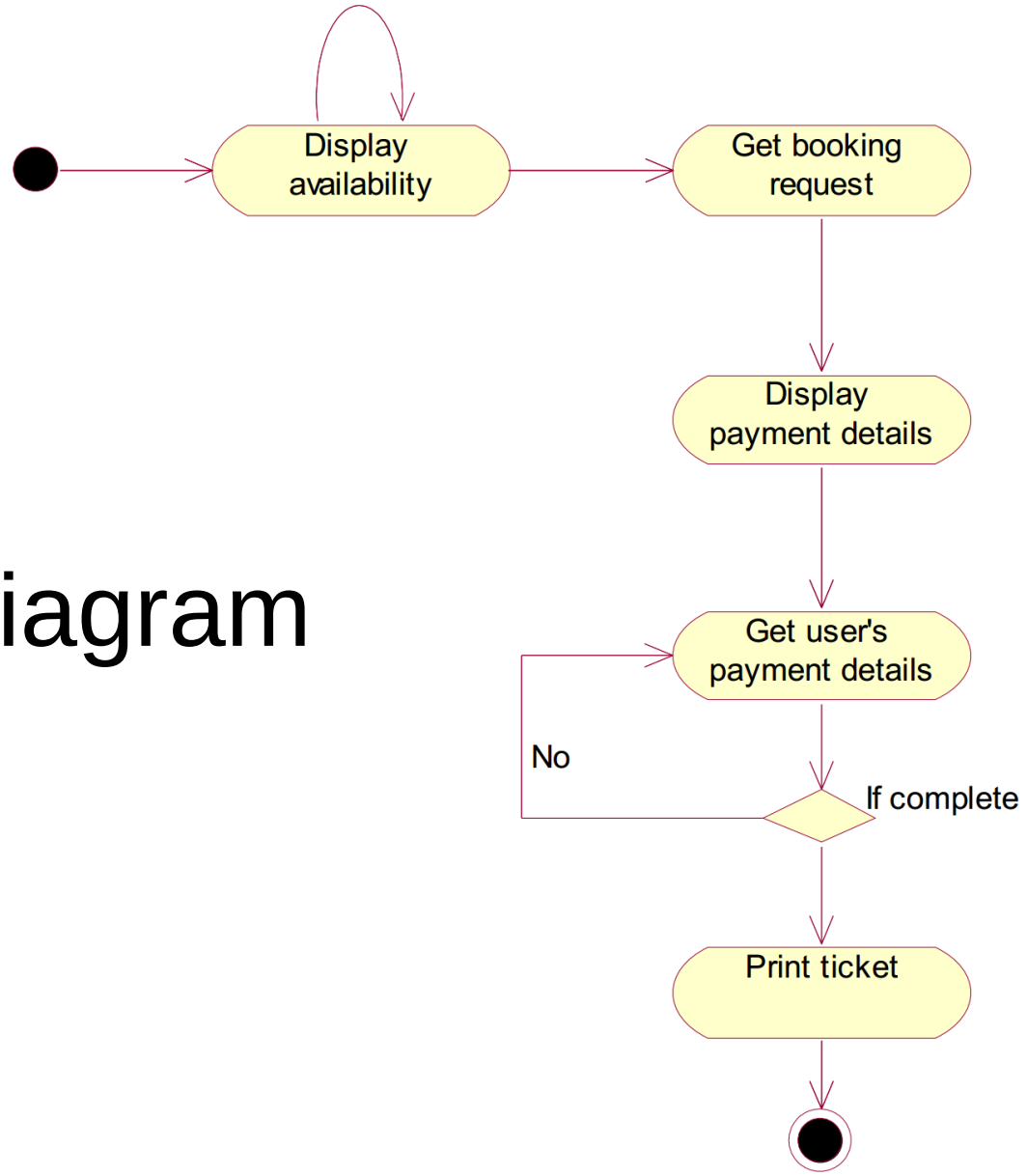
- Step 1
- - Before entering the system, users have to login
- - Get the username and password from existing users.
- - Give new users the option to sign up.
- Step 2
- - Get the source and destination.
- - Provide a dropdown box for the date.
- - Check availability of tickets.
- Step 3
- - If tickets are available, get the number of passengers.
- - Get the name and age of all passengers.
- - If tickets are not available, reschedule.
- Step 4
- - Print the cost of the tickets.
- - Get the payment details from the user.
- - Confirm the details and the ticket.
- - Display confirmed ticket to the user

Exercise

- Given your steps, draw an Activity Diagram

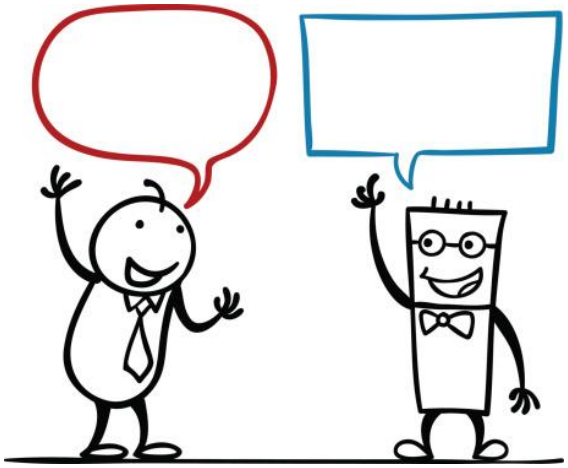


Activity Diagram

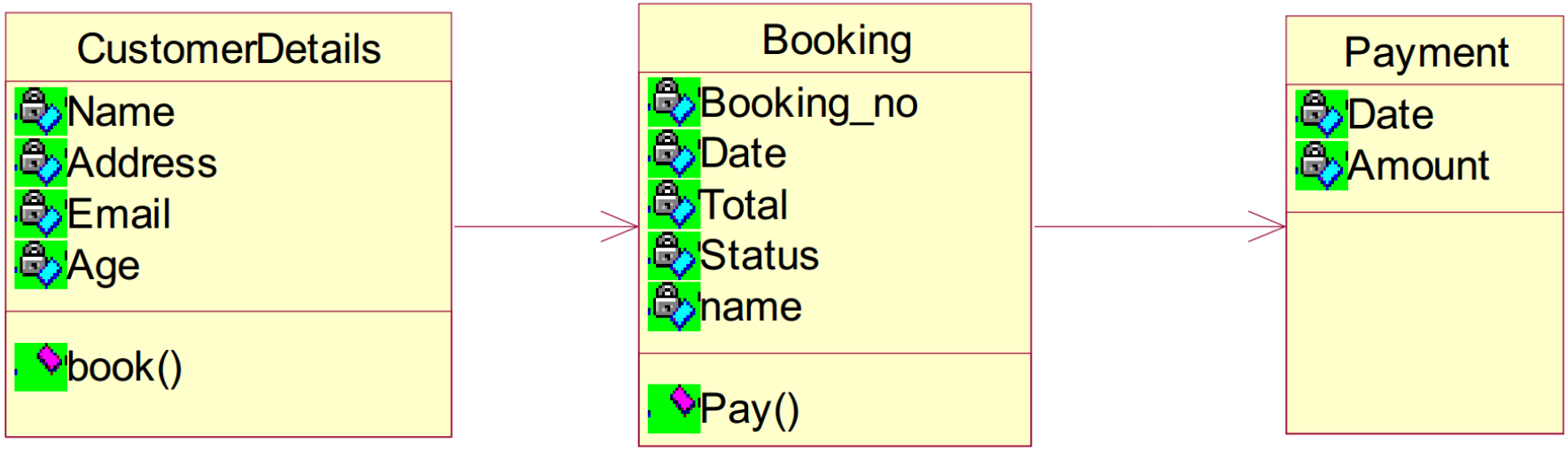


Exercise

- Extend your understanding of the system to include a Class Diagram

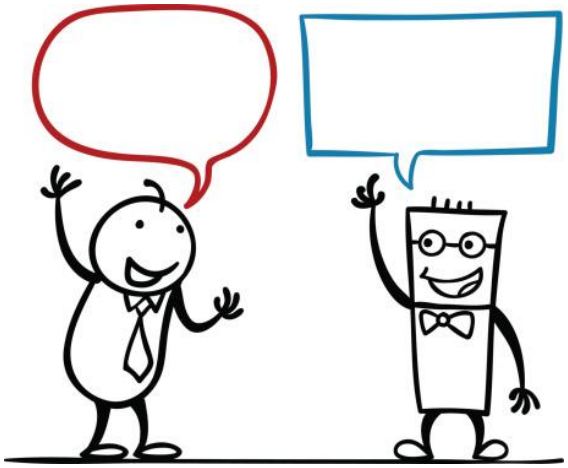


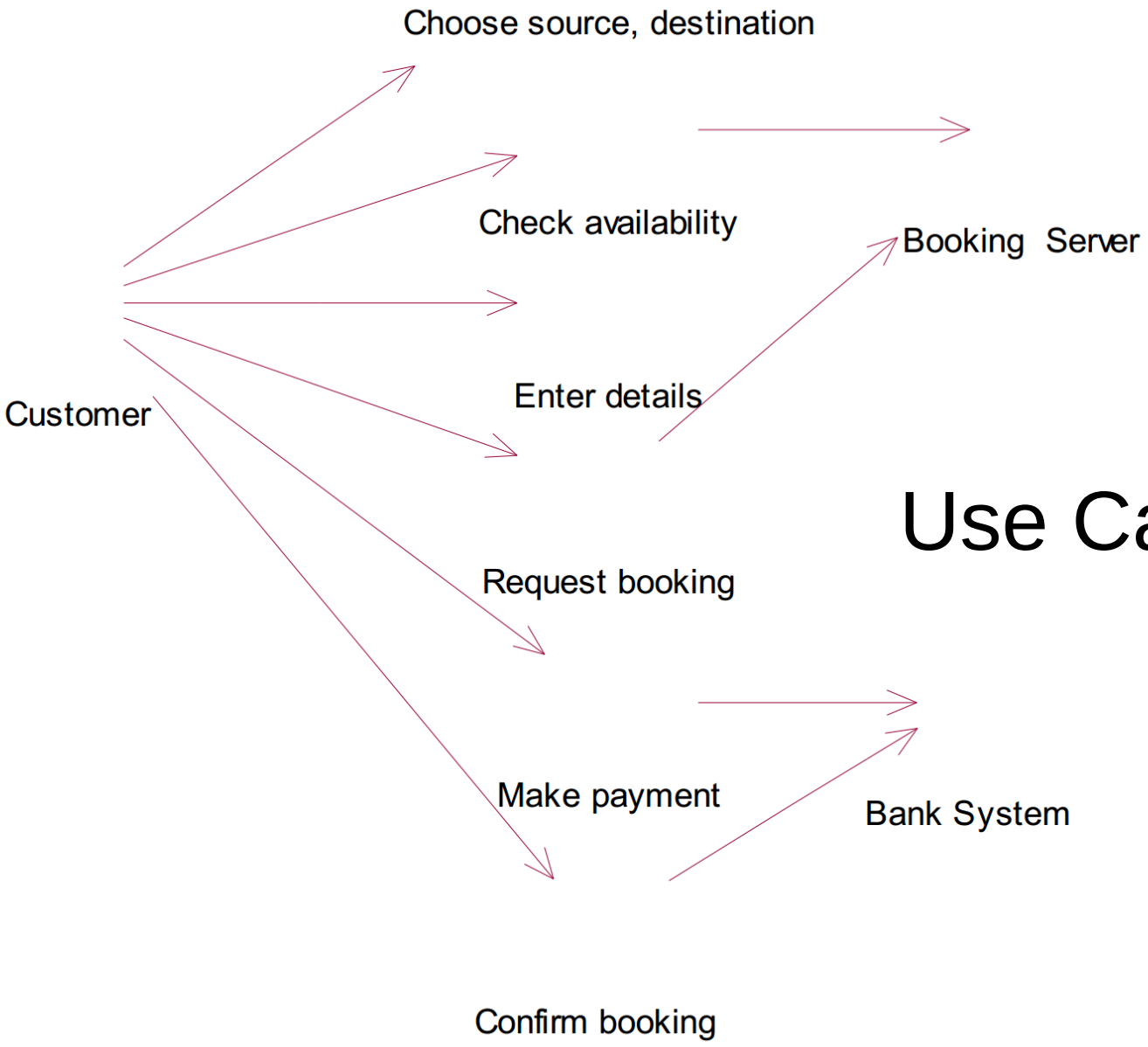
Class Diagram



Exercise

- Draw a use case diagram of your solution

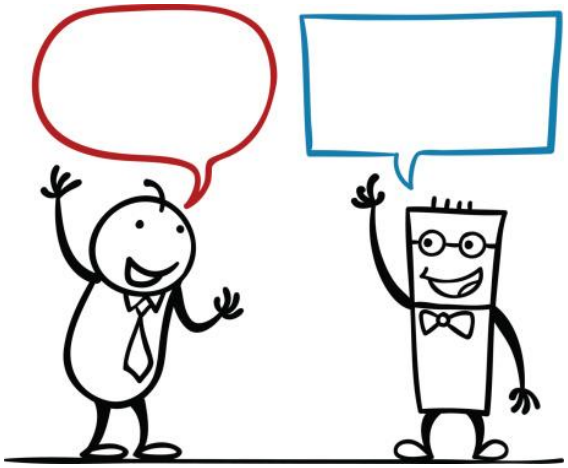


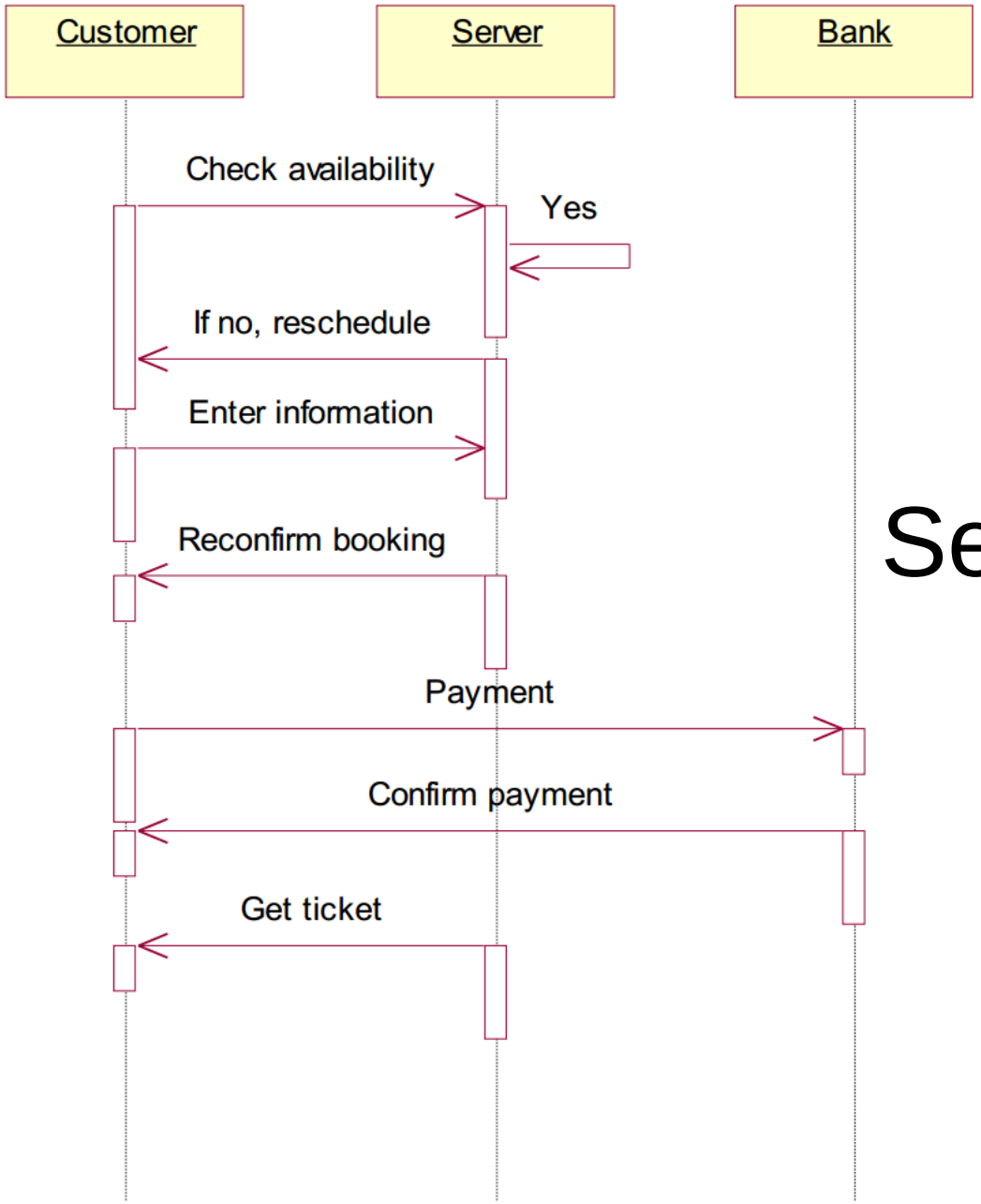


Use Case Diagram

Exercise

- Draw a sequence diagram of your system



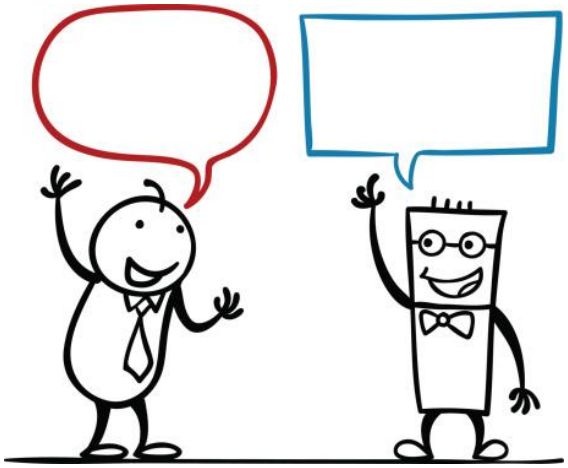


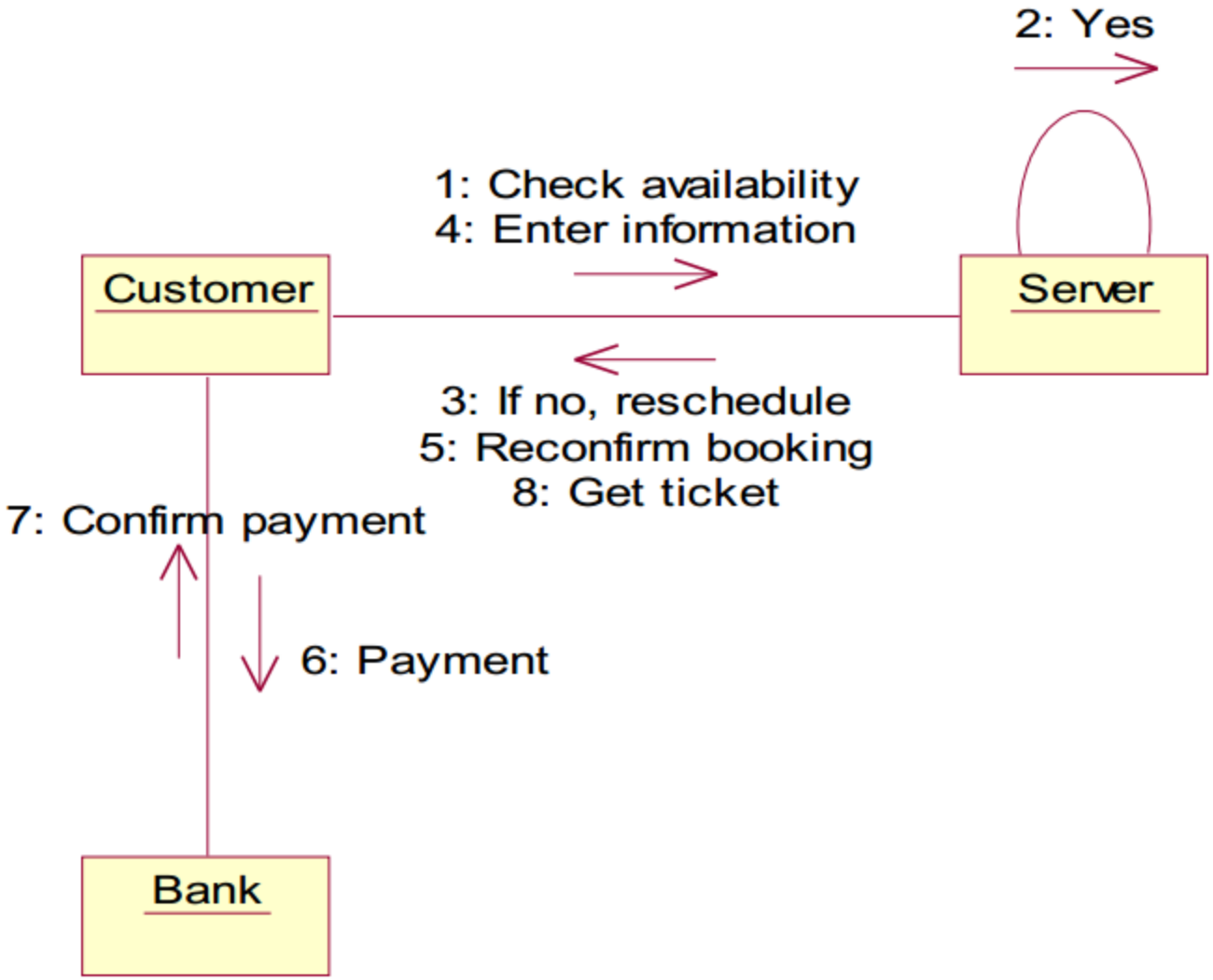
Sequence Diagram

Exercise

- Draw a collaboration diagram of your system solution

Note collaboration diagram, also called a **communication diagram** or interaction diagram , is an illustration of the relationships and interactions among software objects

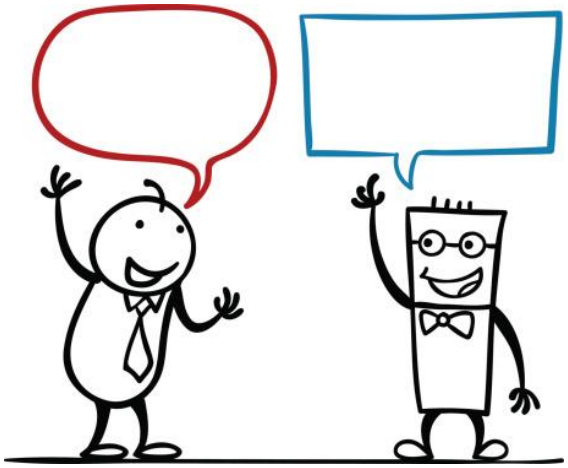




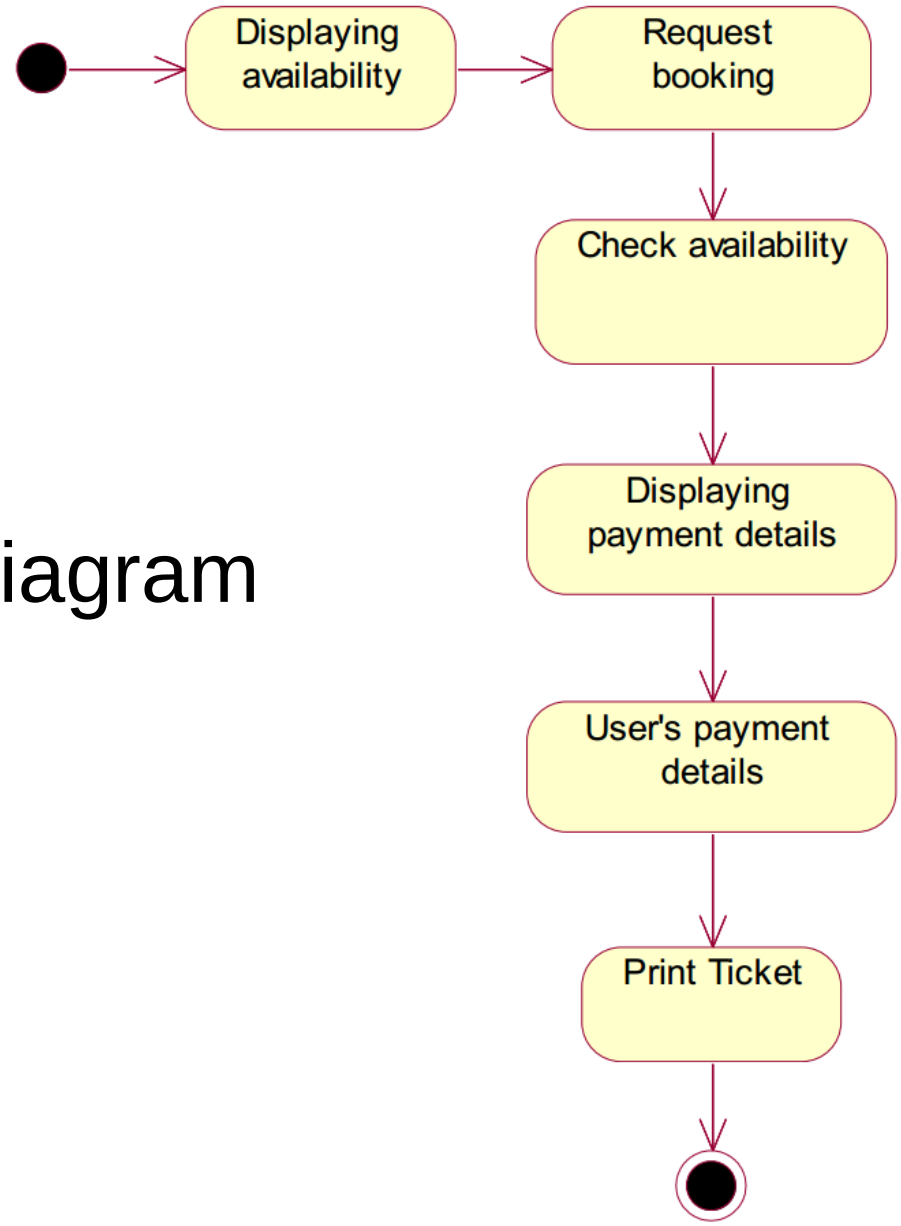
Collaboration Diagram

Exercise

- Draw a state chart diagram of your system

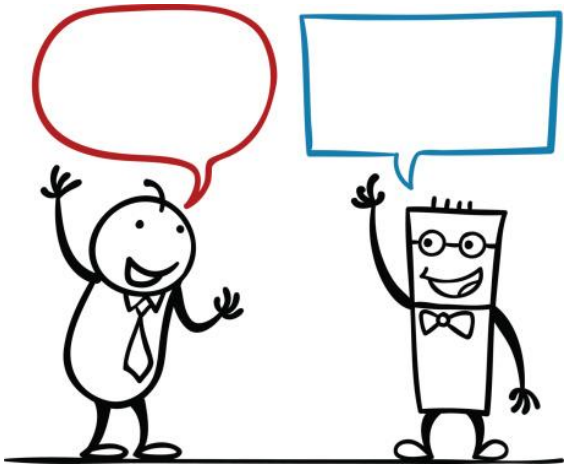


State Chart Diagram

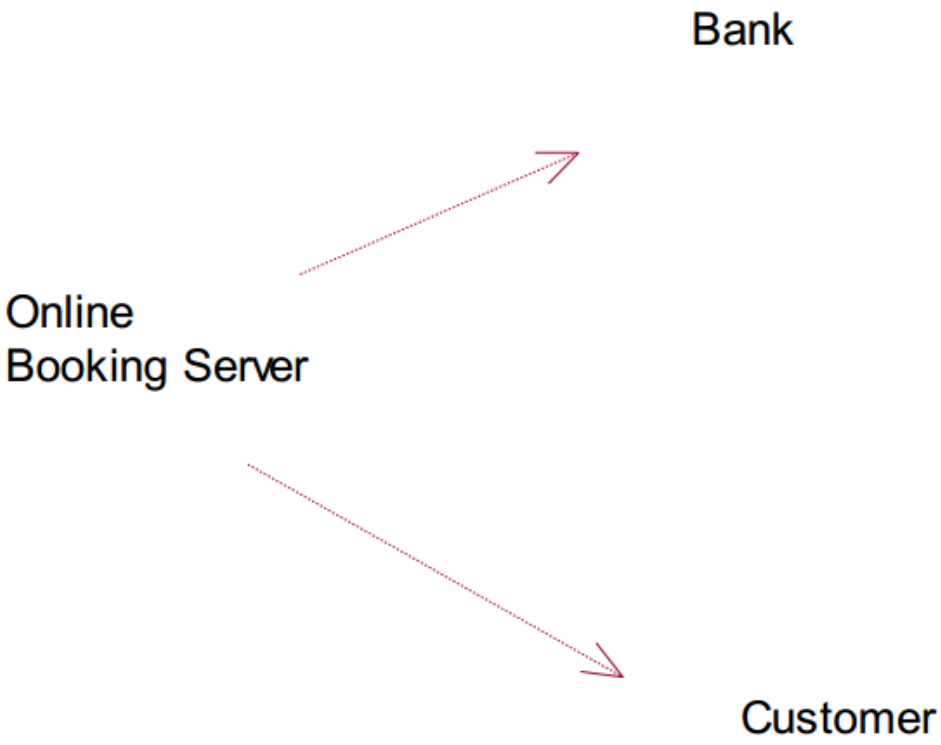


Exercise

- Draw a component diagram of your system

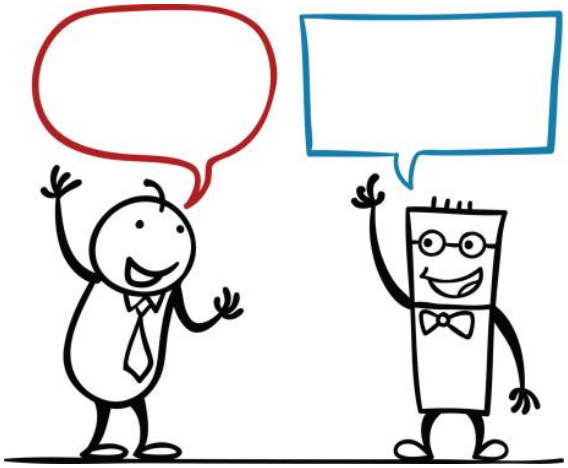


Component Diagram

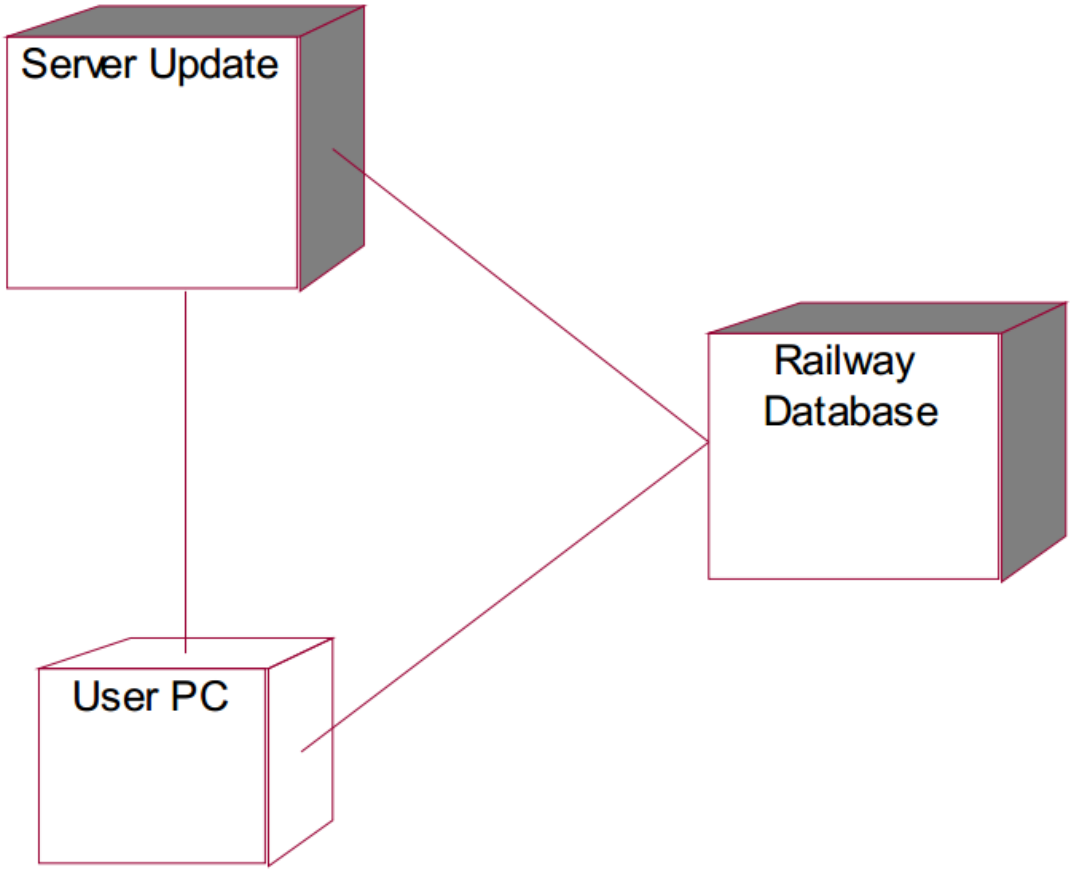


Exercise

- Draw a deployment diagram of your system



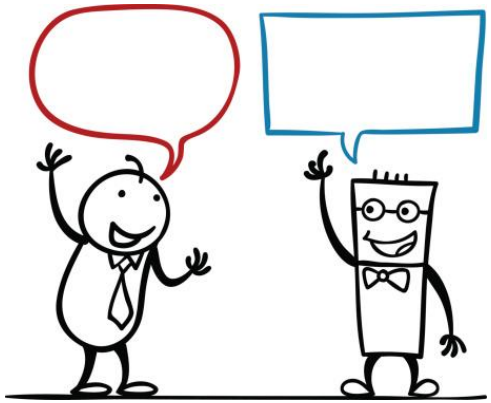
Deployment Diagram



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

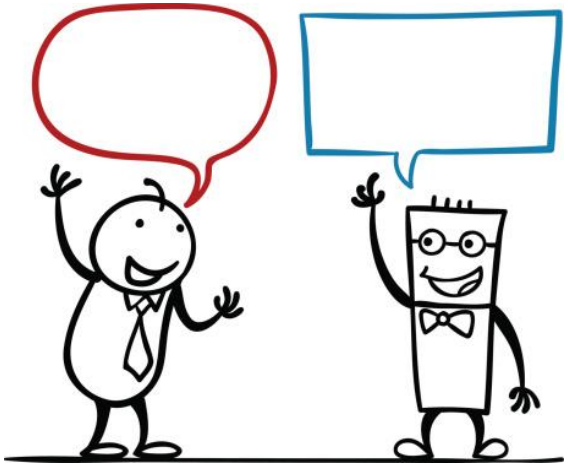
Plan-Driven

- 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

Question

- Briefly summarize the importance of using inheritance

  (5 minutes)



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

- Write down what Use case diagrams are used for?

Answer

- To model the context of a system by enclosing all the activities of a system within a rectangle and focusing on the actors outside the system by interacting with it

- To model the requirements of a system from the outside point of view

Question

- Write down what Interaction Diagrams and what are they used for?

Answer

- Interaction diagrams depict interactions of objects and their relationships. They also include the messages passed between them.

- Interaction diagrams are used for modeling −
  - ▷ the control flow by time ordering using sequence diagrams.
  - ▷ the control flow of organization using collaboration diagrams.

Question

- There are two categories of elements in an object-oriented system
- Major Elements & Minor Elements

Write down the the four major and three minor elements.

Answer

- Major
  - Abstraction
  - Encapsulation
  - Modularity
  - Hierarchy
- Minor
  - Typing
  - Concurrency
  - Persistence

Question

- There are two types of typing are – write them down and explain them

Answer

- Strong Typing − Here, the operation on an object is checked at the time of compilation, as in the programming language Eiffel

- Weak Typing − Here, messages may be sent to any class. The operation is checked only at the time of execution, as in the programming language Smalltalk

Question

- Write down the five phases of the XP lifecycle

Answer

1. *Exploration*: Determine feasibility, understand key “stories” for the first release, and develop exploratory prototypes
2. *Planning*: Agree on the date and stories for the first release
3. *Iterations to release*: Implement and test selected stories in a series of iterations. Refine the iteration plan
4. *Productionizing*: Prepare supporting materials (documentation, training, marketing), and deploy the operational system
5. *Maintenance*: Fix and enhance the deployed system

Question

- Write down what the advantages and disadvantages of the Spiral Model

Answer

Advantages	Disadvantages
▪ Estimates (i.e. budget, schedule, etc.) become more realistic as work progressed because important issues are discovered earlier. ▪ Early involvement of developers. ▪ Manages risks and develops the system into phases.	▪ High cost and time to reach the final product. ▪ Needs special skills to evaluate the risks and assumptions. ▪ Highly customized limiting re-usability

Question

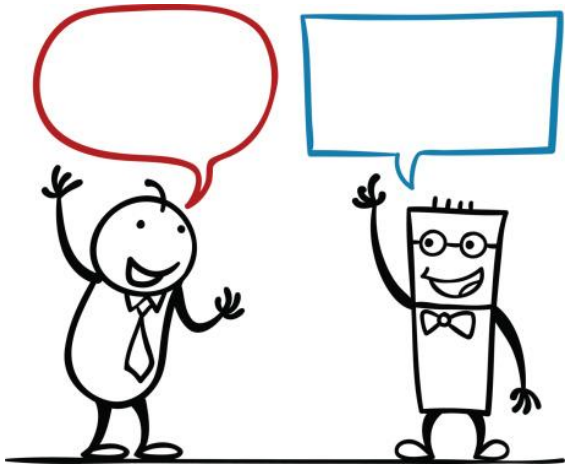
- Write down the advantages and disadvantages of the V-Shaped Model

Answer

Advantages	Disadvantages
▪ Simple and easy to use ▪ Each phase has specific deliverables. ▪ Higher chance of success over the waterfall model due to the development of test plans early on during the life cycle. ▪ Works well for where requirements are easily understood. ▪ Verification and validation of the product in early stages of product development.	▪ Very inflexible, like the waterfall model. ▪ Adjusting scope is difficult and expensive. ▪ The software is developed during the implementation phase, so no early prototypes of the software are produced. ▪ The model doesn't provide a clear path for problems found during testing phases. ▪ Costly and required more time, in addition to detailed plan

Discussion

- When would you use an Iterative or Incremental approach?



Summary

- Review
- Case Study
- Example Problems/Solutions
- Final Exam (January)
- Group Project
- Review Questions

This Week

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

Question

- Deadline for final group project submission?

Answer

- 25th December

Also deadline for online quizzes

Questions/Discussion