CSC290 Communication Skills for Computer Scientists

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Lecture 4; Oct 1, 2018

Reminder

- Team Charter due Sunday (suggest submit by Friday).
- Topic choices this Friday.
- No lecture / tutorial next week!
  - Thanksgiving and Reading Week
  - Reading week recommendations posted
- Blog post topic posted (due following Sunday)
- Midterm information posted

Unified Modelling Language (UML)

What is UML?

UML is is a general-purpose modeling language in the field of software engineering, which is designed to provide a standard way to visualize the design of a system.

What is UML used for?

- Analysis and design of software
- Modelling software built using object-oriented languages
- Documentation and communication
- Requirement analysis

Types of UML Diagrams

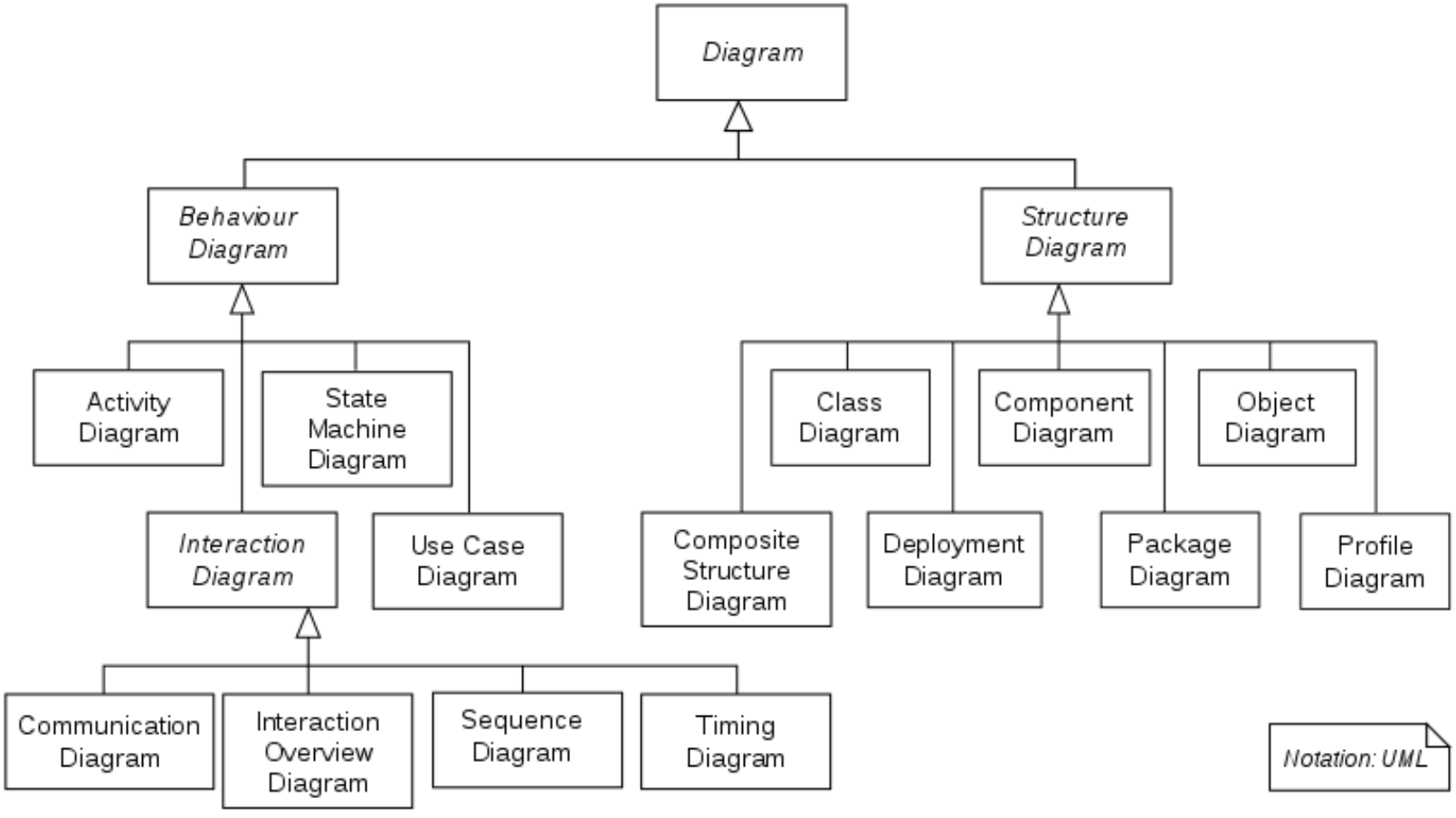


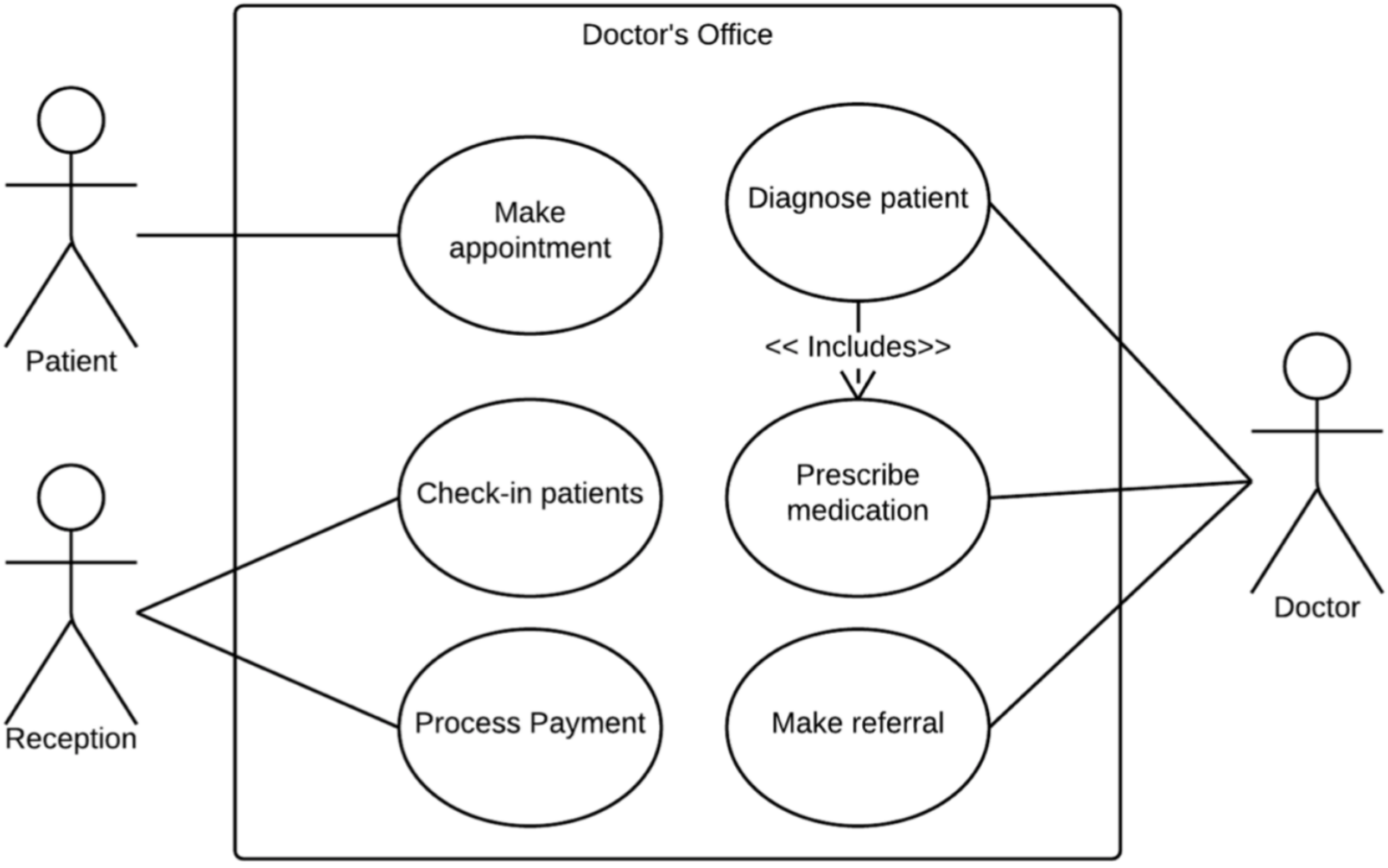
Figure 1: from wikipedia

Our focus

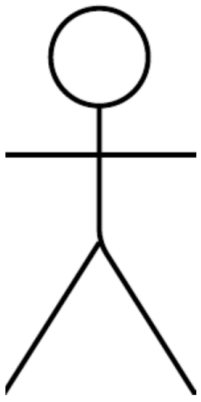
- Use Case Diagram
- Activity Diagram
- Class Diagram

Use Case diagram

Use Case diagram



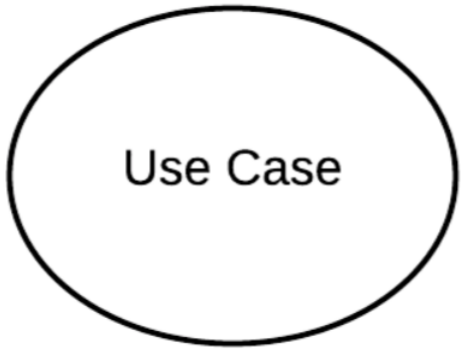
Parts of a Use Case Diagram



Actor: an external entity which interacts with your system

- Carries out or triggers use cases
- Does not have to be a person; could be an external system
- Labelled with a noun or noun phrase (eg. customer, purchaser, administrator)

Parts of a Use Case Diagram

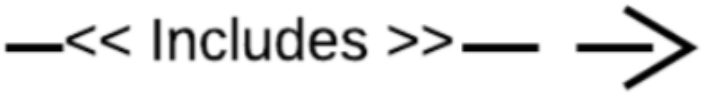


Use case: a set of scenarios tied together by a common user goal

- Can extend or include another use case
- Represents a major piece of system functionality
- Labelled with a descriptive verb-noun phrase:
  - active voice, present tense verb phrase,
  - direct object phrase (eg, renew vehicle registration)
- Avoid vague use case names, like “manage X” or “perform X”.
  - vague, do not resonate with business experts
  - possibly too high level of granularity

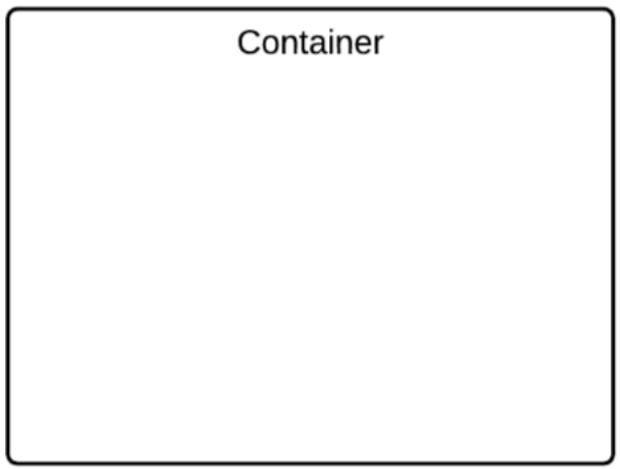
Parts of a Use Case Diagram

Associations: links actor with a use case; non-directional



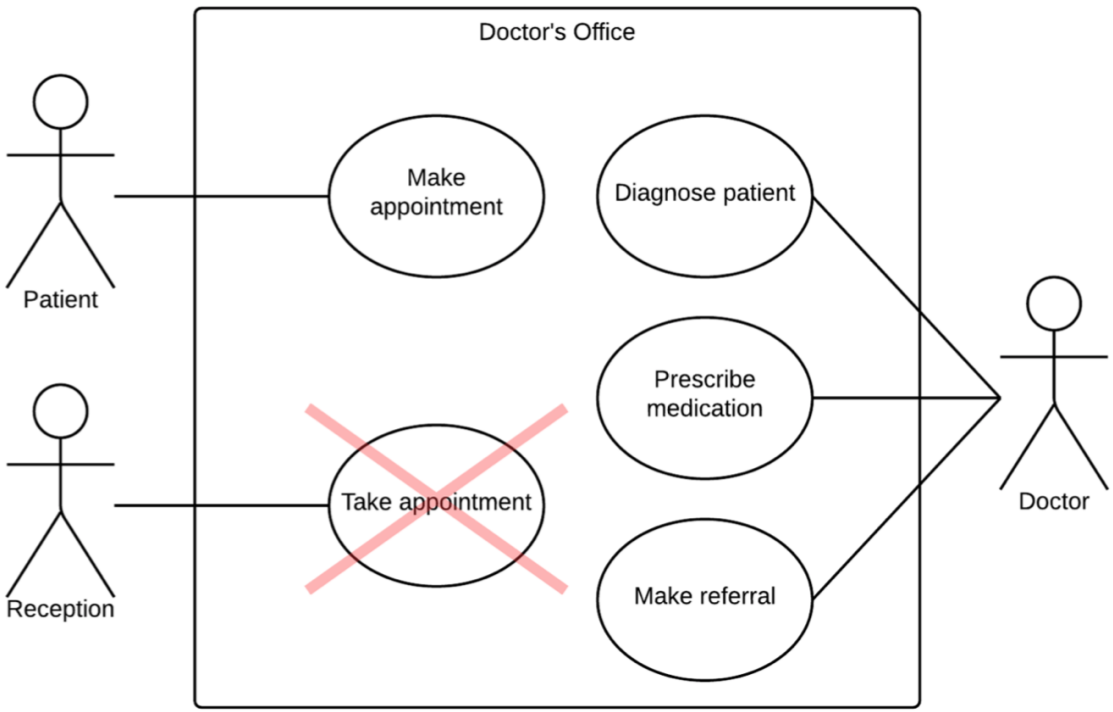
Include or Extend Relationships: associates two use cases; directional; dashed line labelled with relationship

Parts of a Use Case Diagram

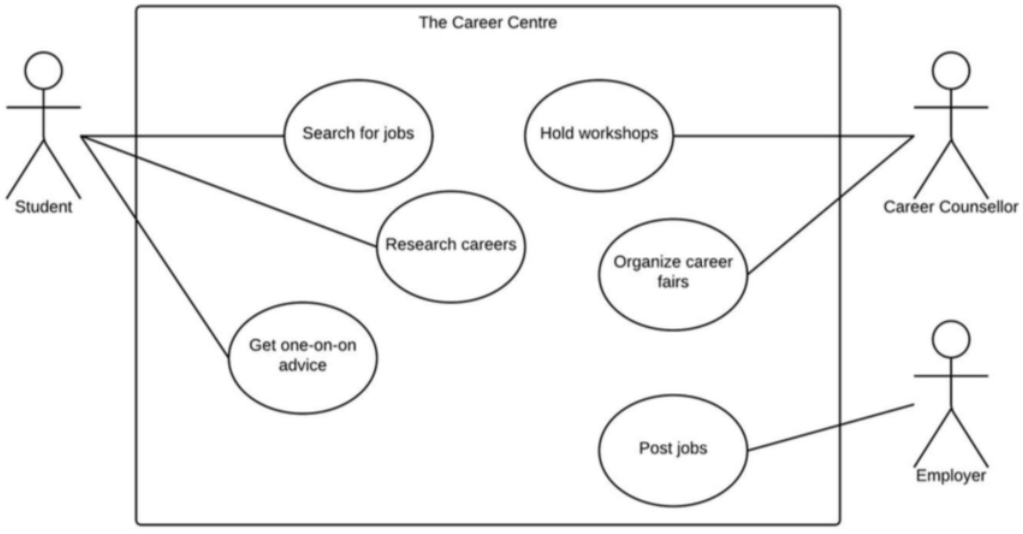


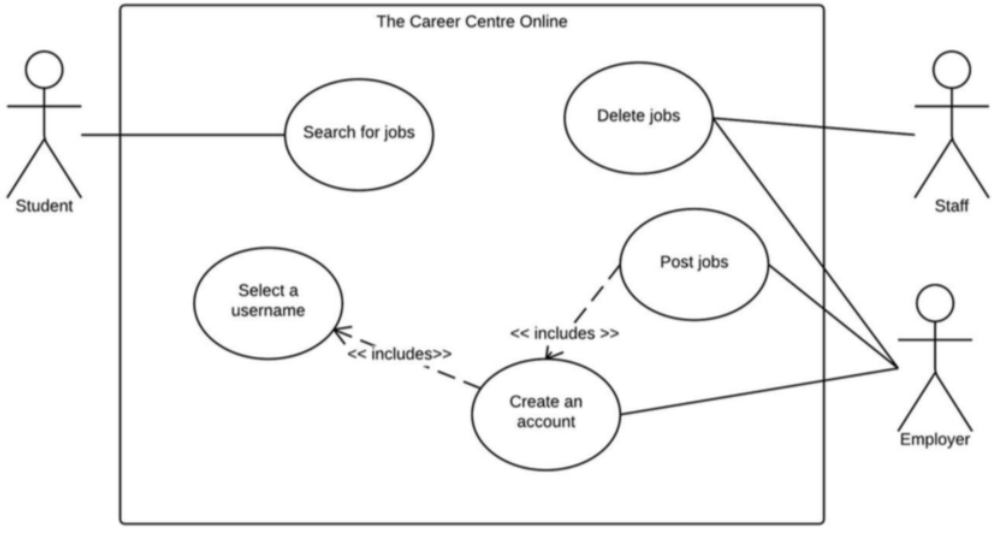
System Boundary A box or border that separates actors from use cases to denote that actors are external to the system

Pitfall: repeat use case



Pitfall: business system vs software system





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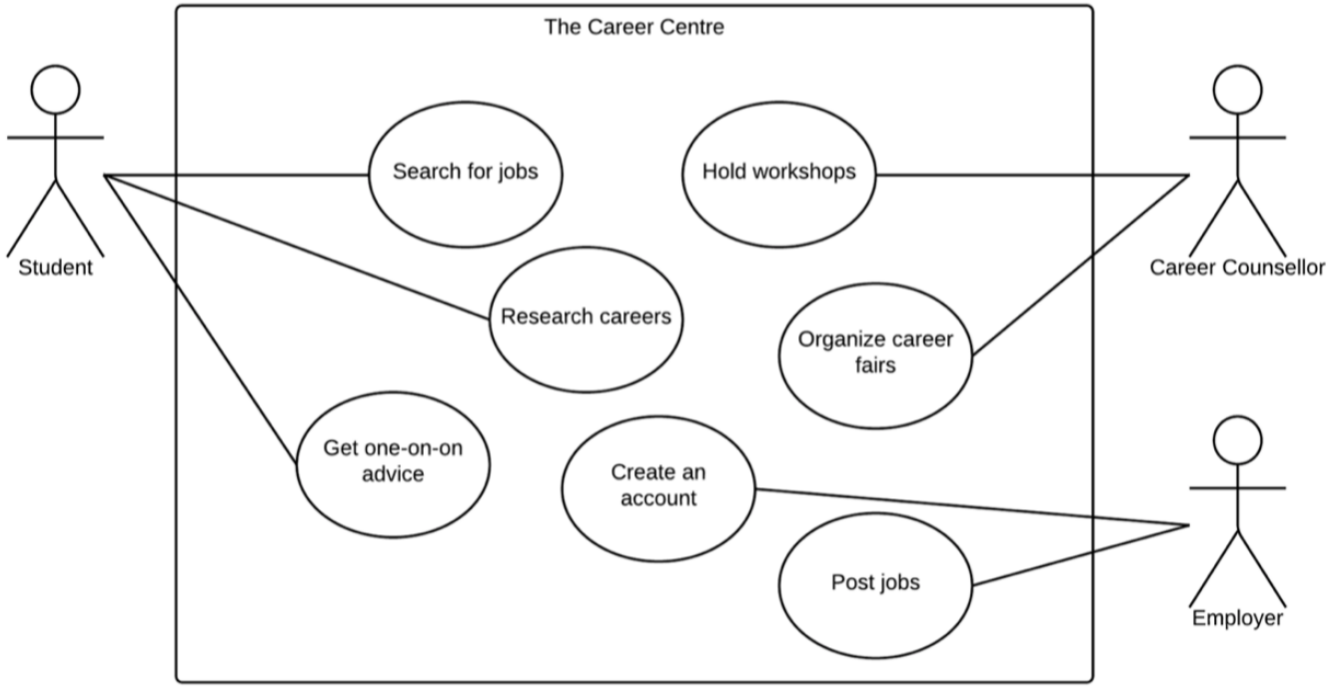
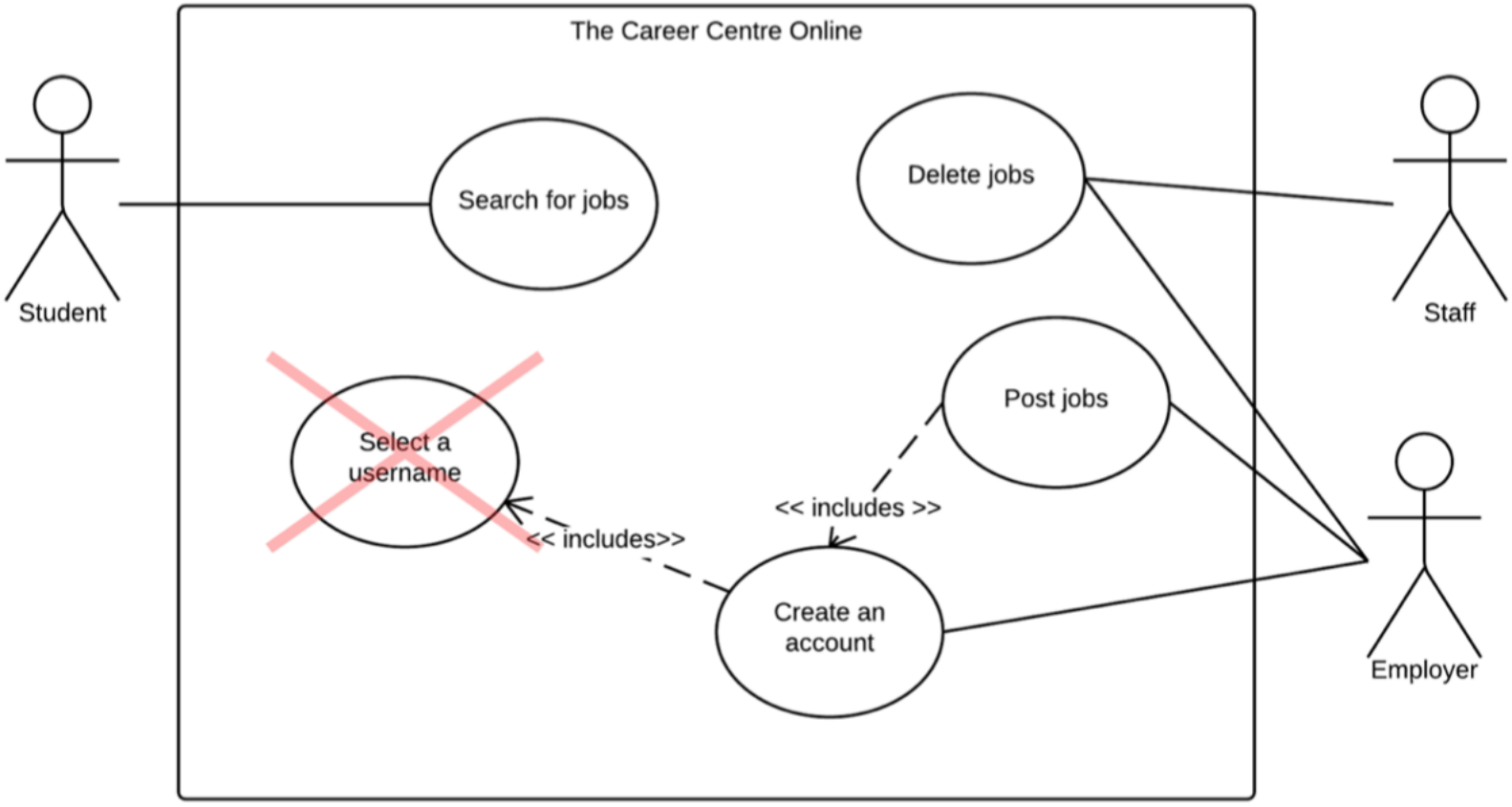


Pitfall: inconsistent use case level



Exercise

Create a use case diagram for MarkUs.

Group Work

Tuckman's Stages of Group Development

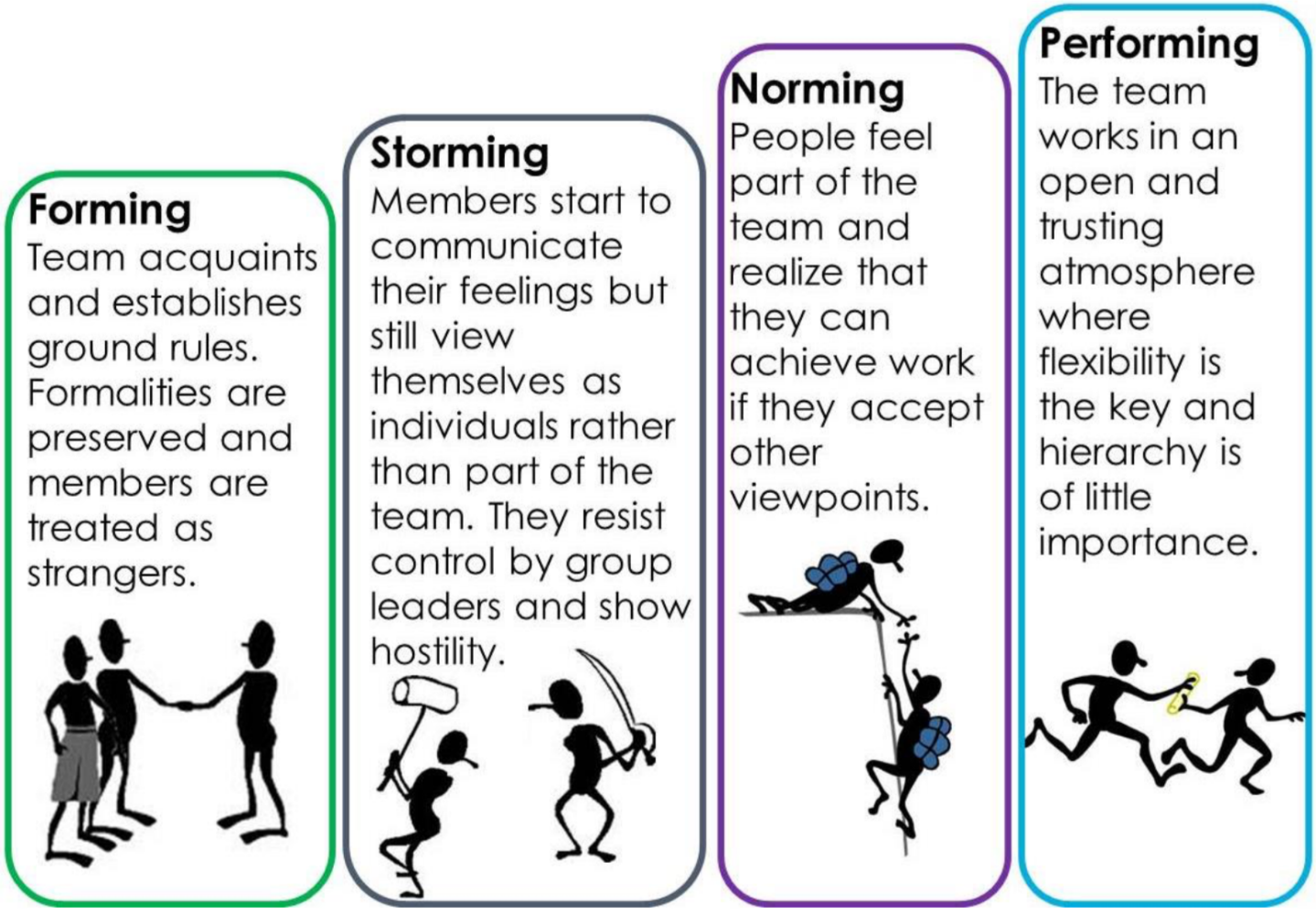


Figure 2: Modified from http://wheatoncollege.edu/sail/files/2011/12/groupDevelopment.jpg

Group Development

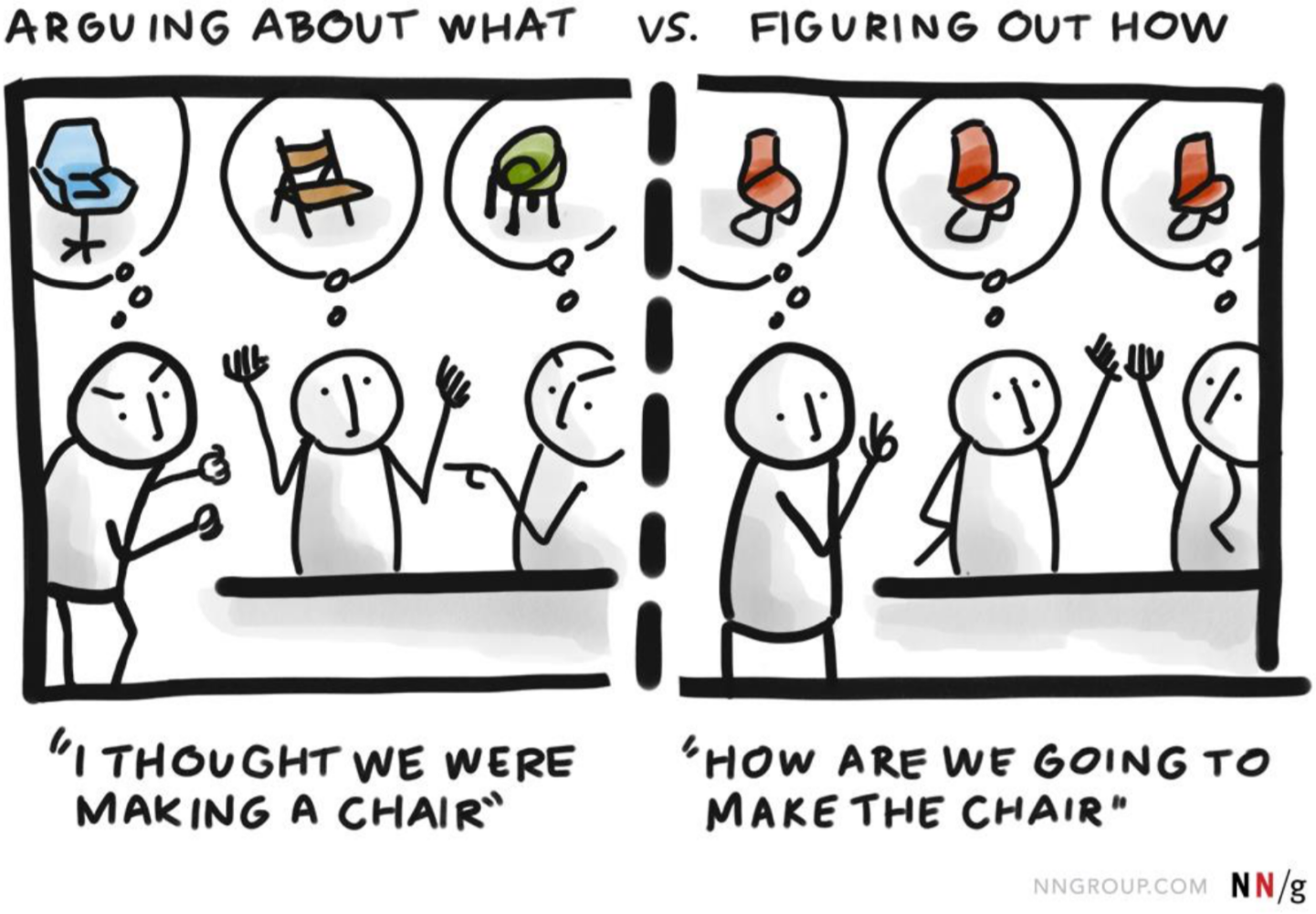


Figure 3: From https://www.nngroup.com/articles/design-thinking-team-building/

Some Effective Teamwork Strategies

- Get to know each other
- Exchange contact information
- Figure out how you prefer to communicate with each other
- Identify a common goal
- Define roles and responsibilities
- Address problems quickly
- Communicate, communicate, communicate

Qualities of a Well Functioning Team

- Roles are well defined
- Consensus can be reached
  - **Consensus**: moving forward with a decision regardless of agreement; "every team member can move forward without bad mouthing the decision"
- Respectful environment
- Organized

Qualities of a Good Team Member

- Is respectful
- Supportive of the team goals
- Understands his/her role in the team
- Contributes to the team according to his/her role

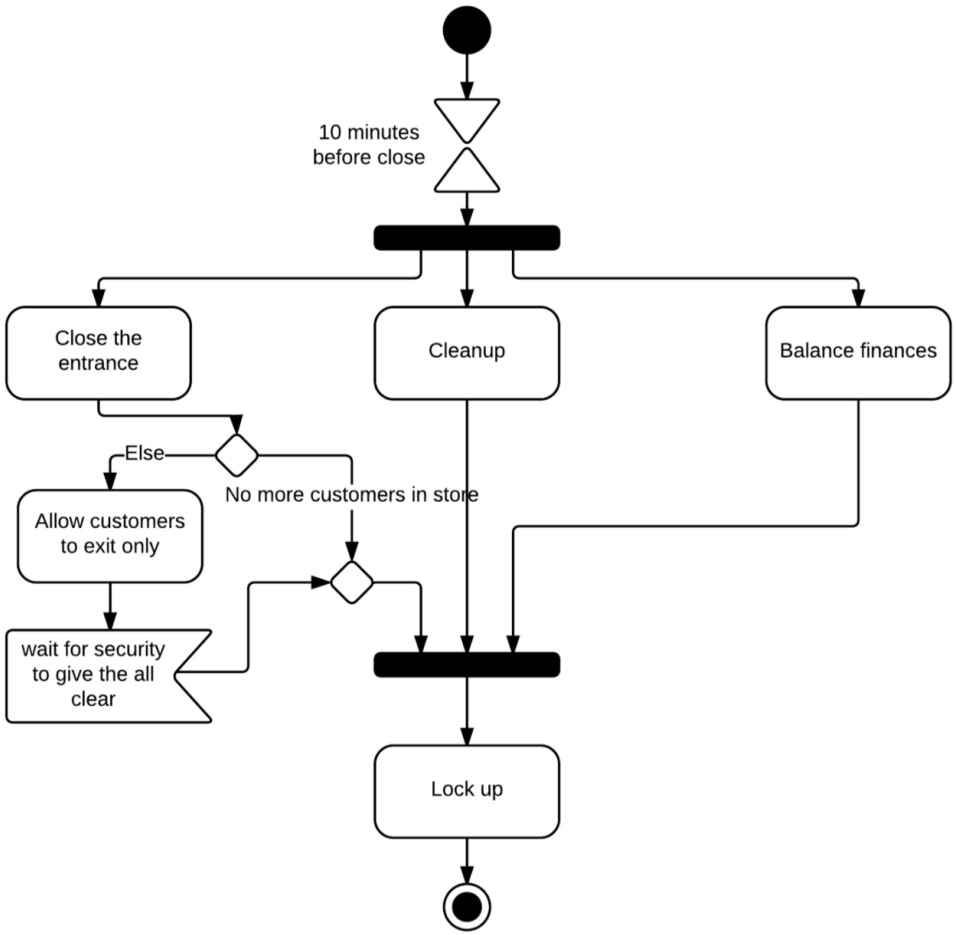
Communication Skills for All Team Members

- Can explain your own ideas clearly
- Can express your feelings in an open but non-threatening way
- **Listen** carefully to others
- Ask questions to clarify others' ideas & emotions
- Can sense how others feel based on their nonverbal communication
- Initiate conversations about group or process if you sense tensions brewing
- Reflect on activities & interactions of your group

Activity Diagram

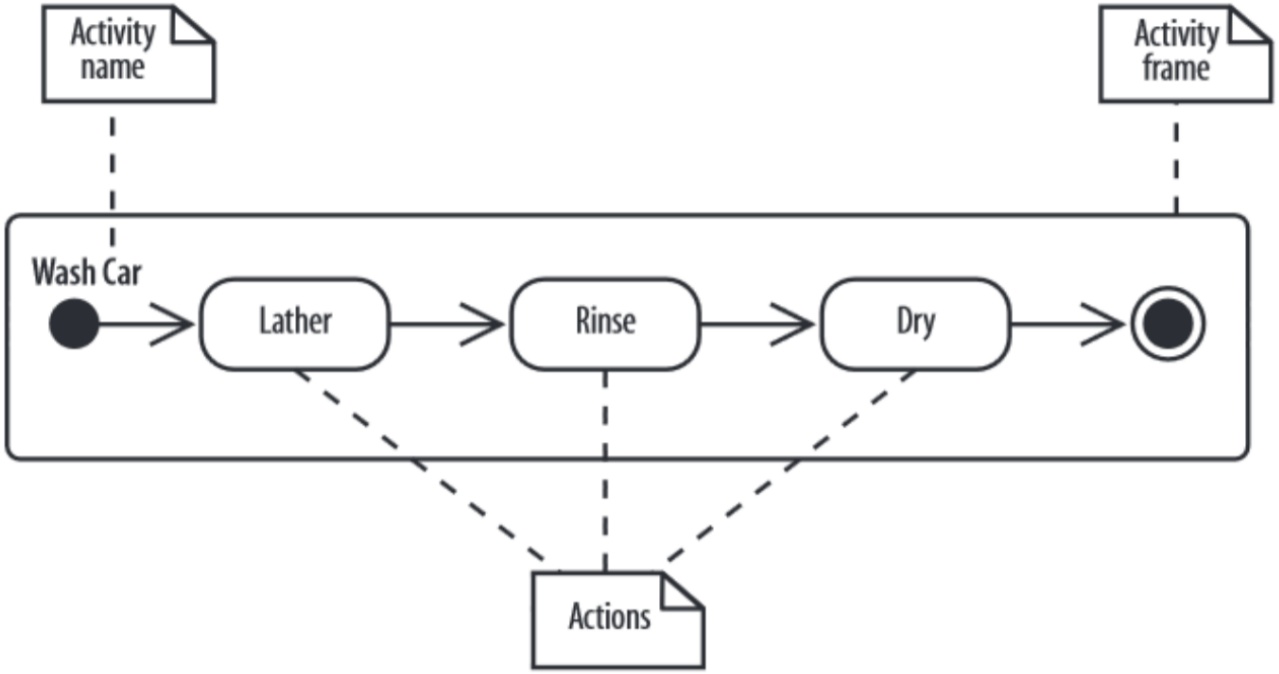
Activity Diagram

An **activity diagram** is used to describe procedural logic, business processes, or work flow.

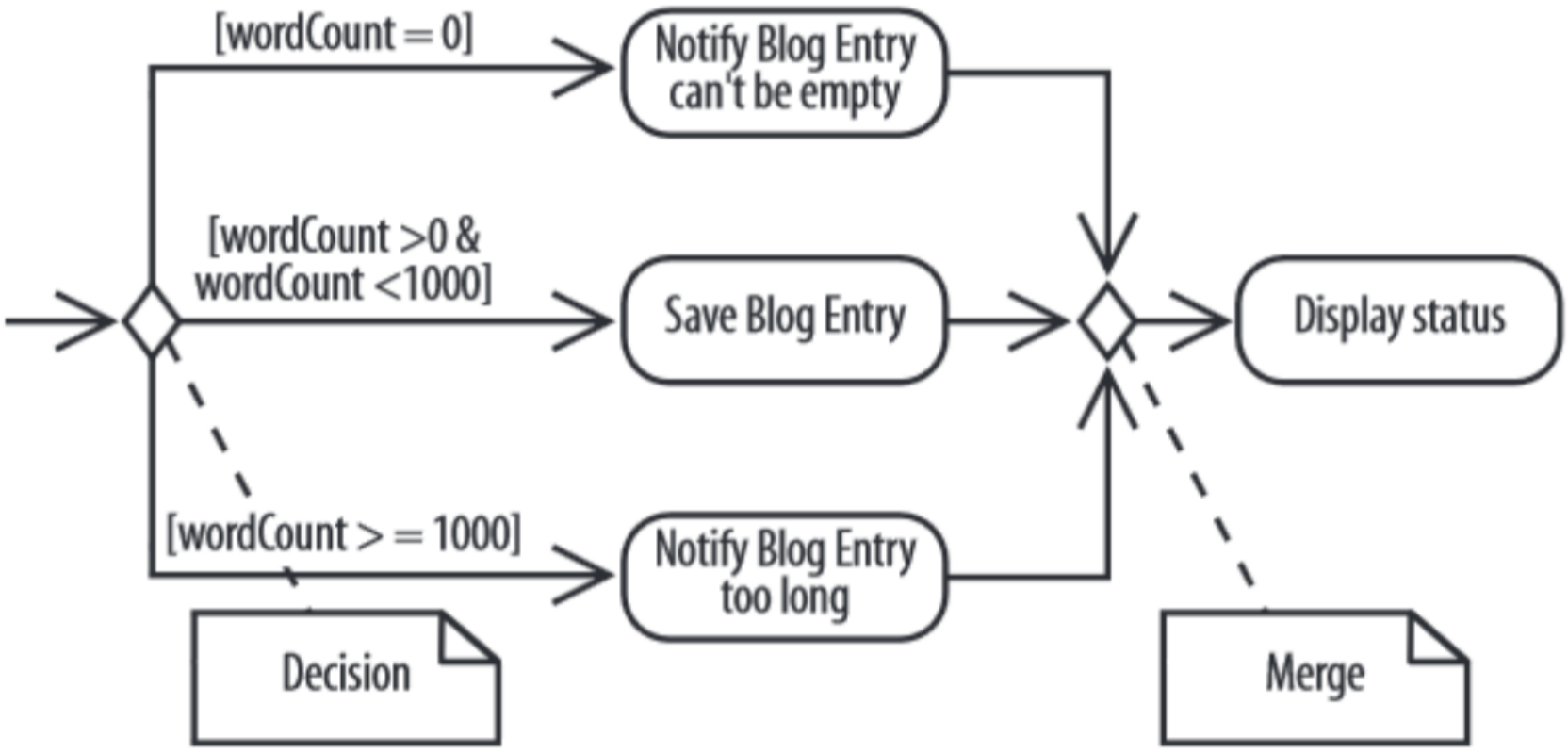


Activity vs Action

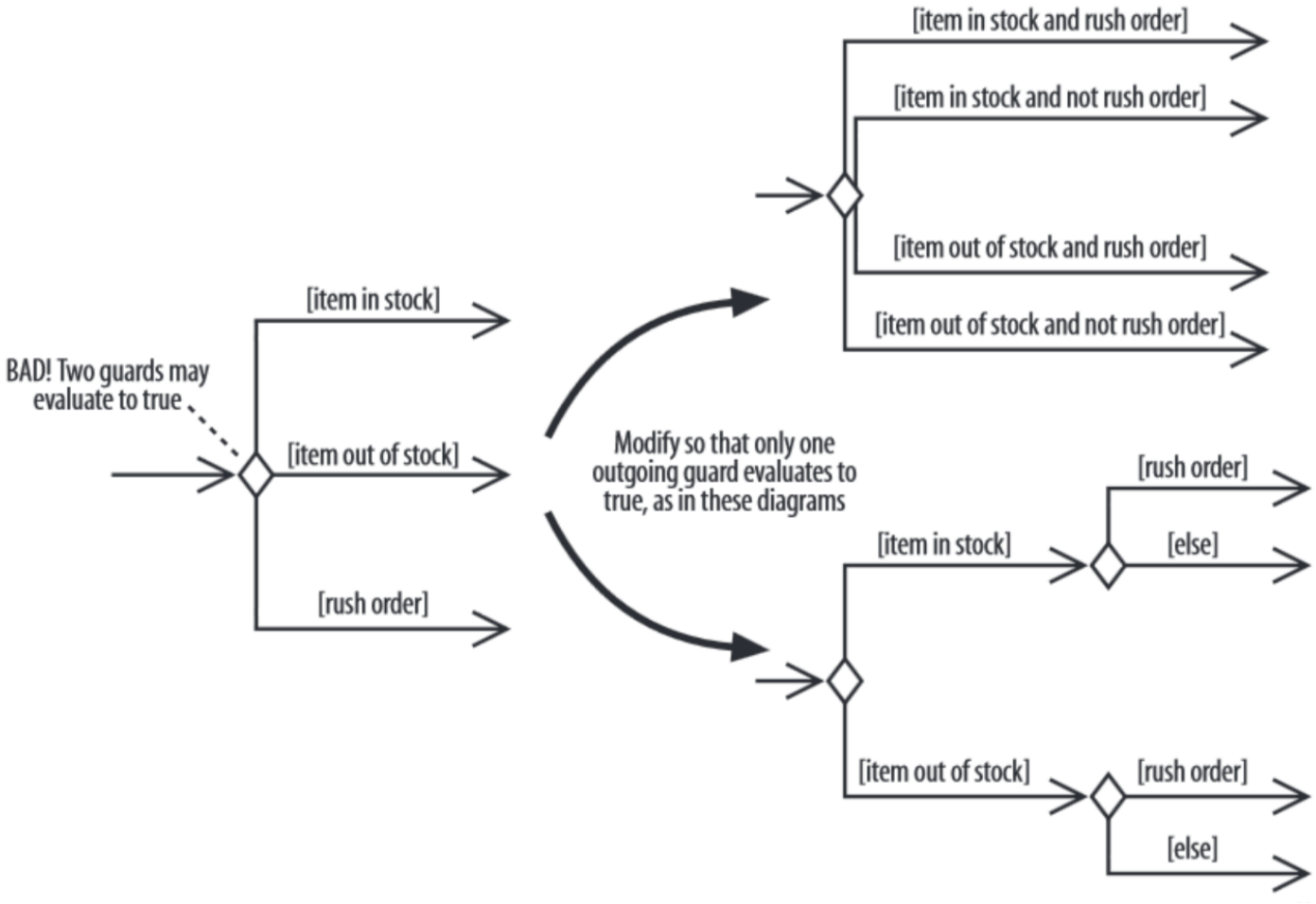
- **Activity**: a sequence of actions
- Nodes in the activity diagram are called **actions**



Decisions & Merges

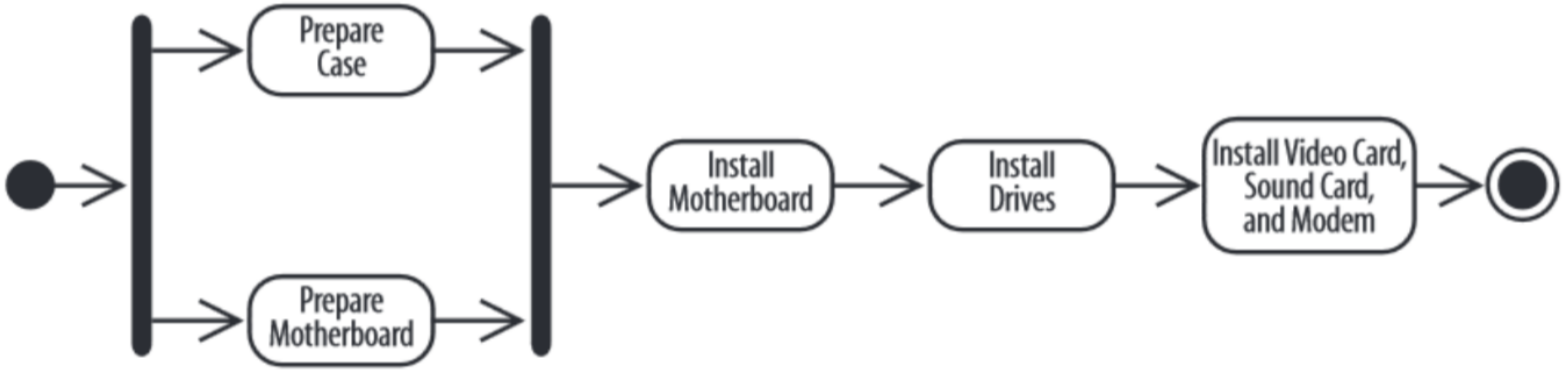


Decisions branches should be mutually exclusive

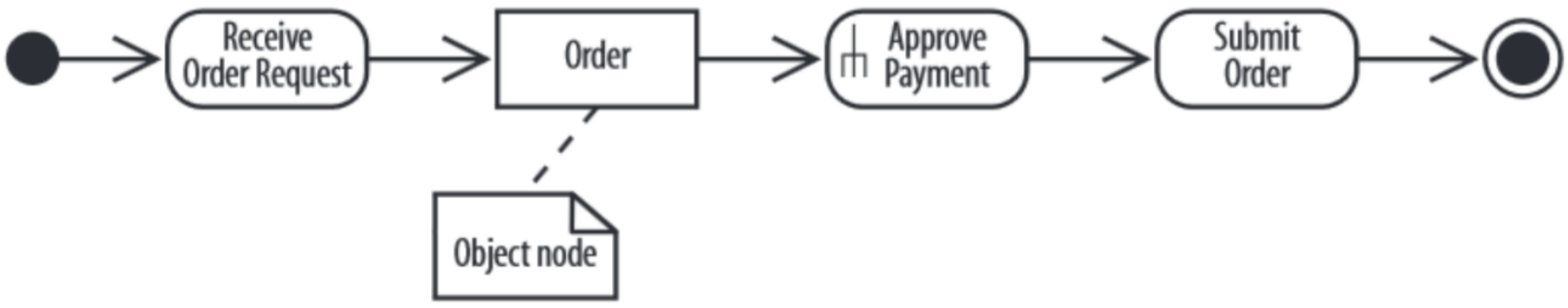


Forks & Joins

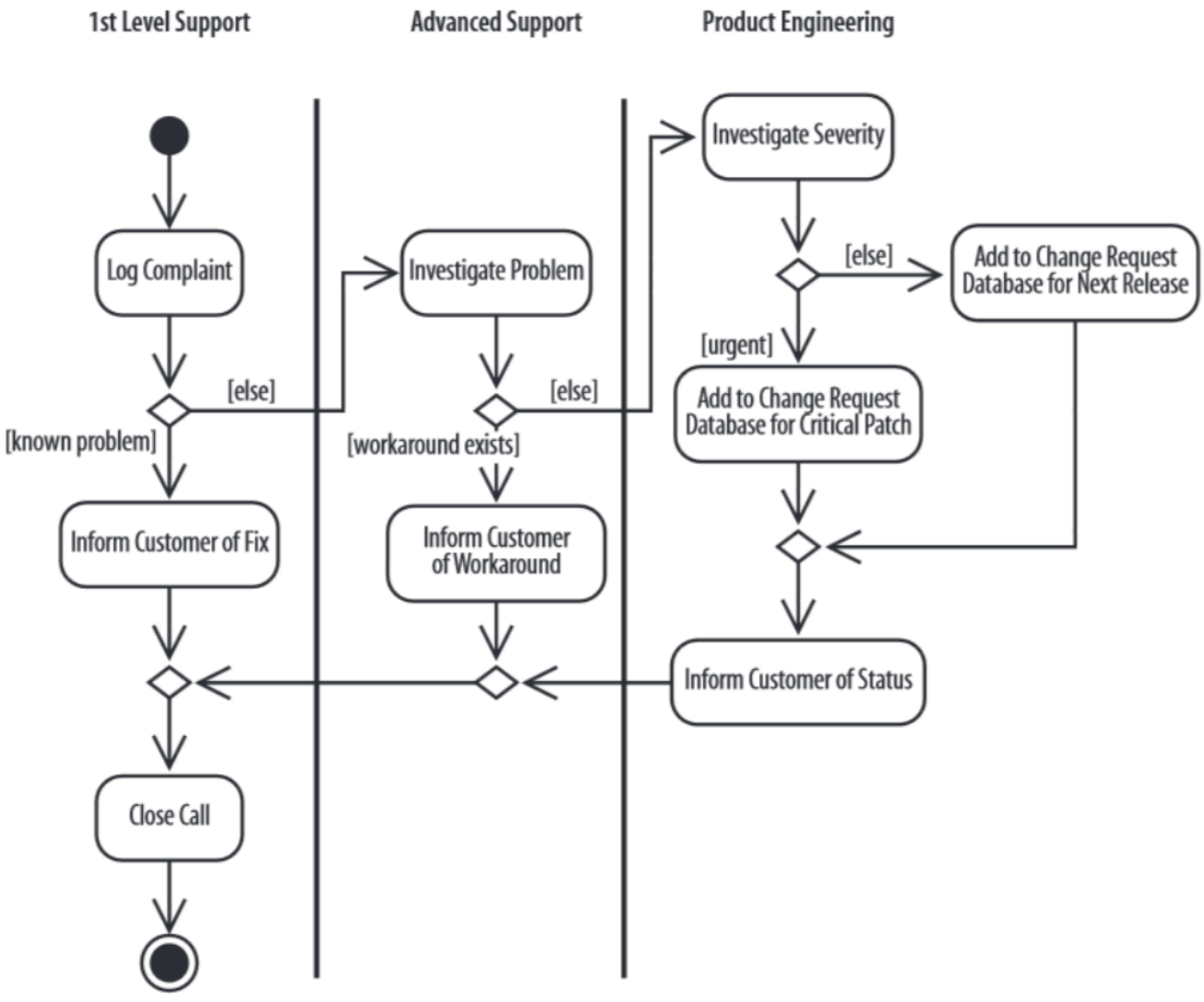
A **fork** represents the start of parallel actions. A **join** waits for all parallel actions to complete.



Object Nodes

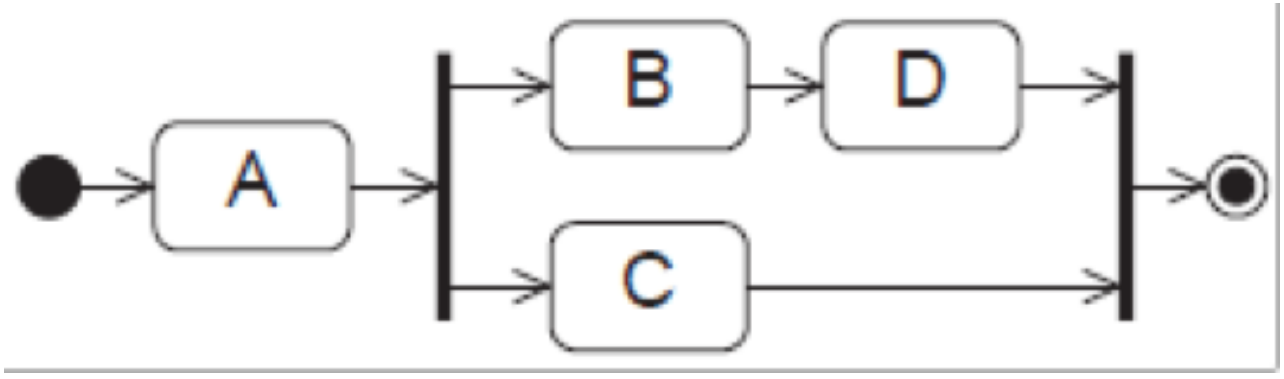


Partitions (Swimlanes)



Exercise

List all possible action orders for the following activity.



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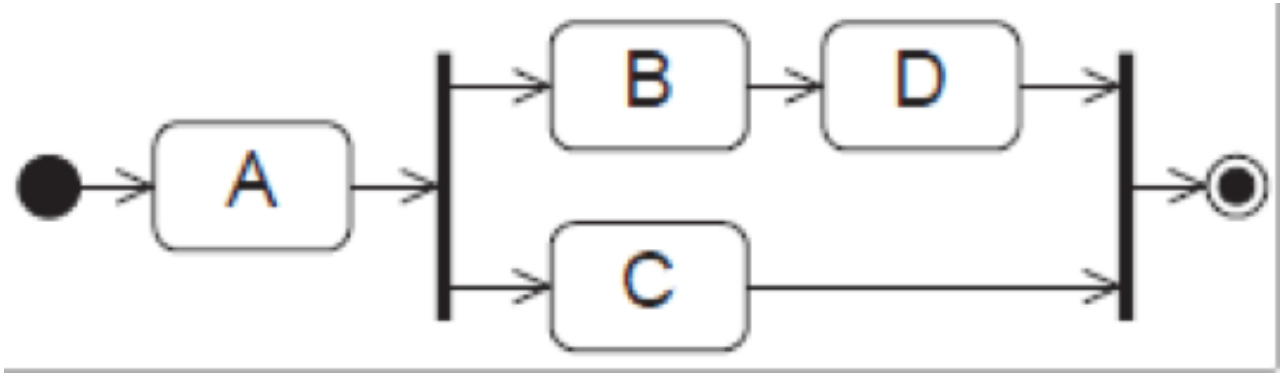


- A, B, D, C
- A, B, C, D
- A, C, B, D

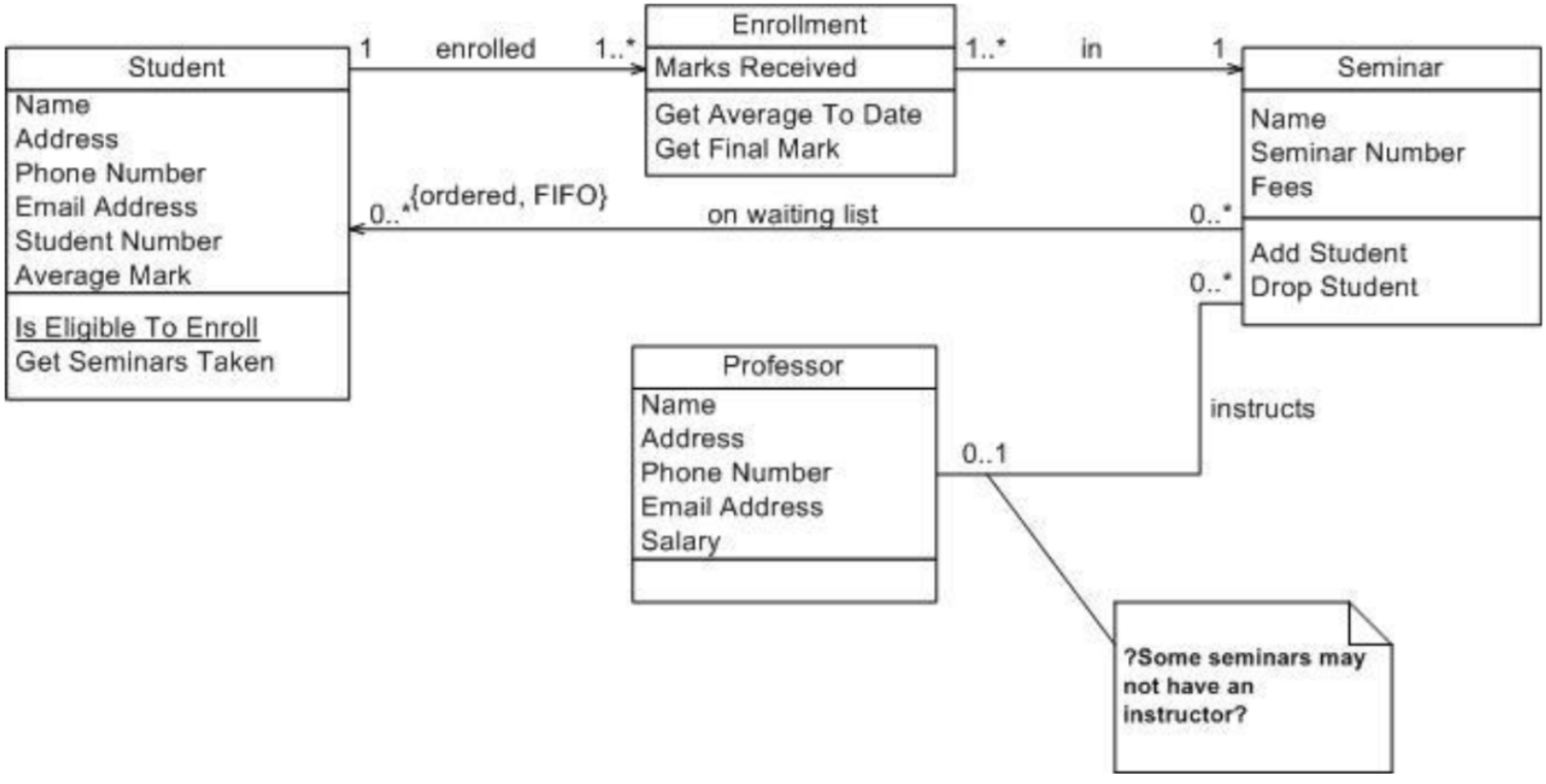
Exercise

Create an activity diagram for submitting a blog post on MarkUs.

Class Diagrams

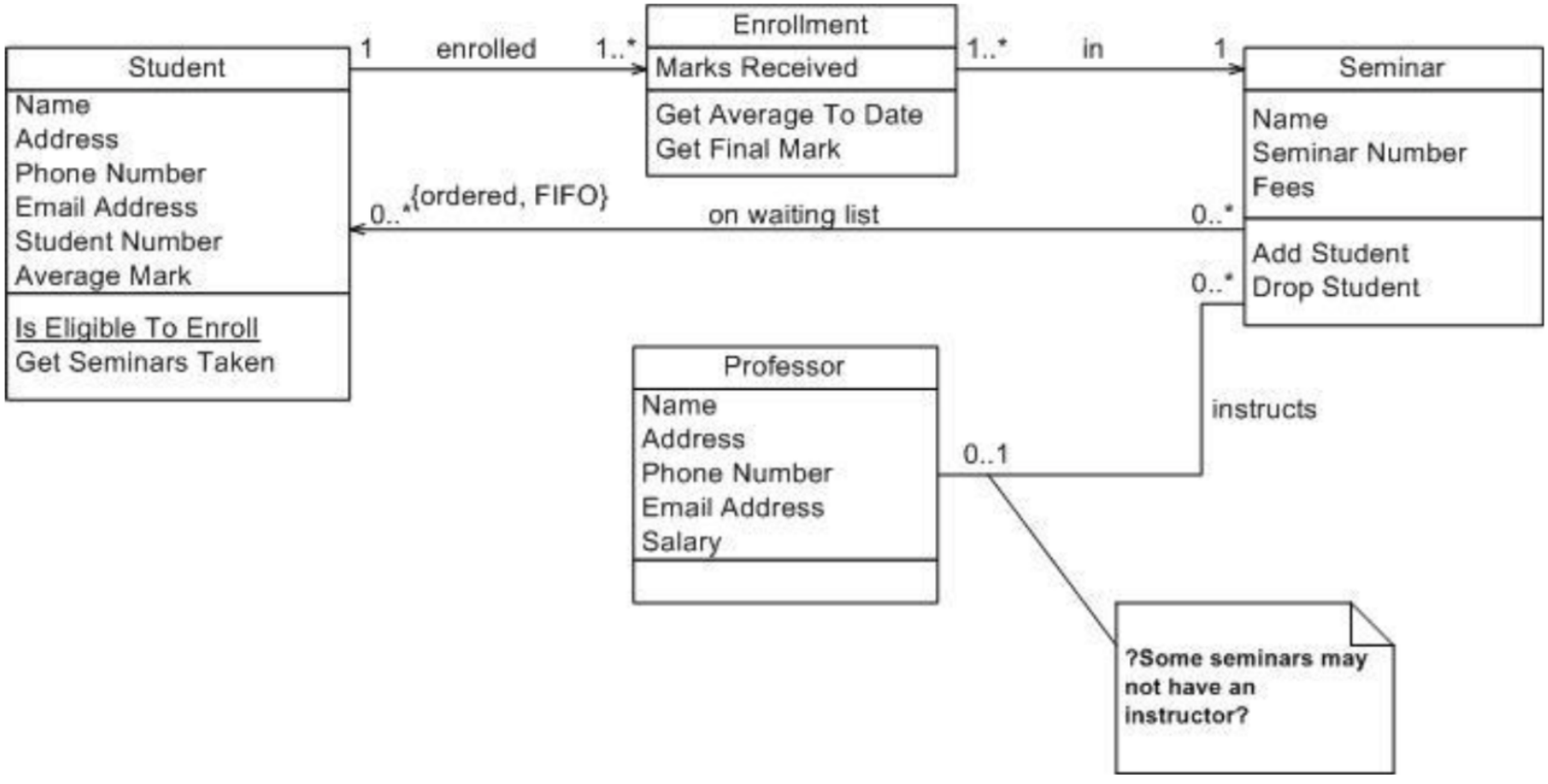
Class Diagram

A **class diagram** illustrates *classes* in a system, shows the *properties* and *operations* of a class, and relationships between classes.



Class Diagram

- What are the **classes** in this system?
- What are some **properties** (attributes)?
- What are some **operations** (methods)?
- What are some **relationships** between the classes?



Learning Outcomes

- Identify, read, and understand use case, activity, and class diagrams.
- Identify when to use use case, activity, and class diagrams.
- Be able to draw use case diagrams for familiar systems.
- Be able to draw activity diagrams for familiar activities.
- Identify issues with use case diagrams:
  - duplicate use case
  - poor use case naming
  - inconsistent use case level,
  - mixing business vs. software systems
- Identify issues with activity diagrams:
  - Missing nodes
  - Improper node type
  - Non-mutually exclusive branches

References

These slides borrow heavily from Nia McCash's CSC290 slides from Fall 2017.