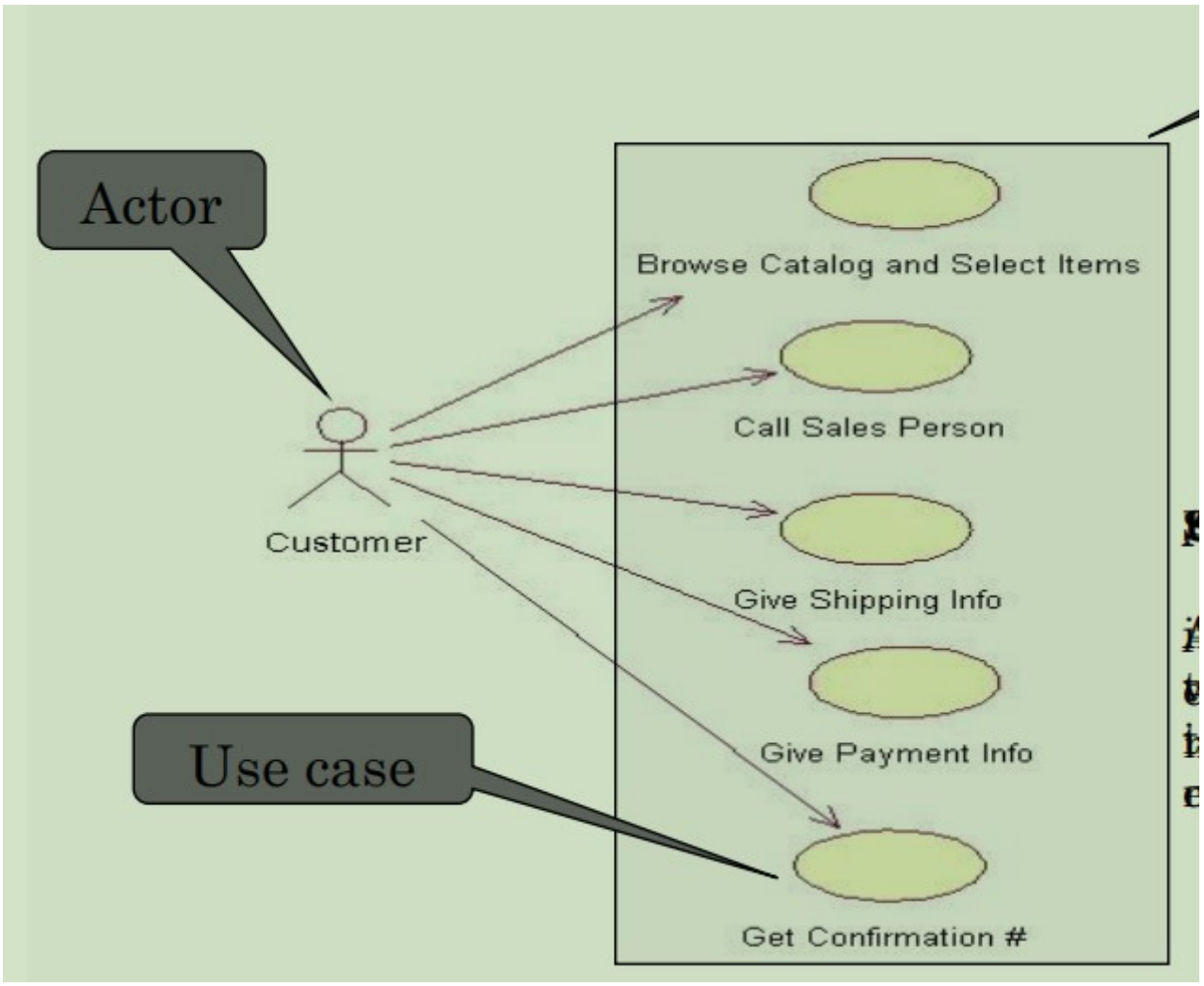
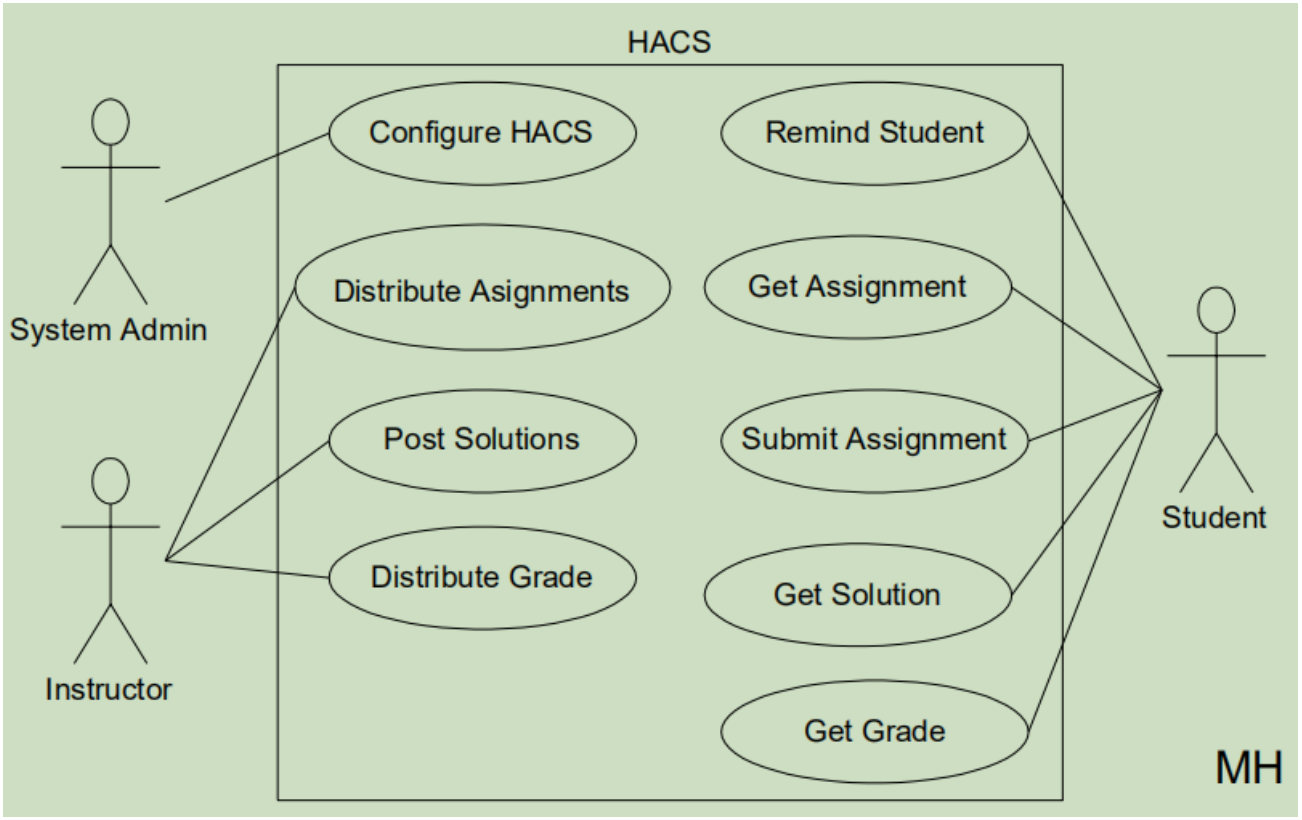
L5 UML 需要单独复习

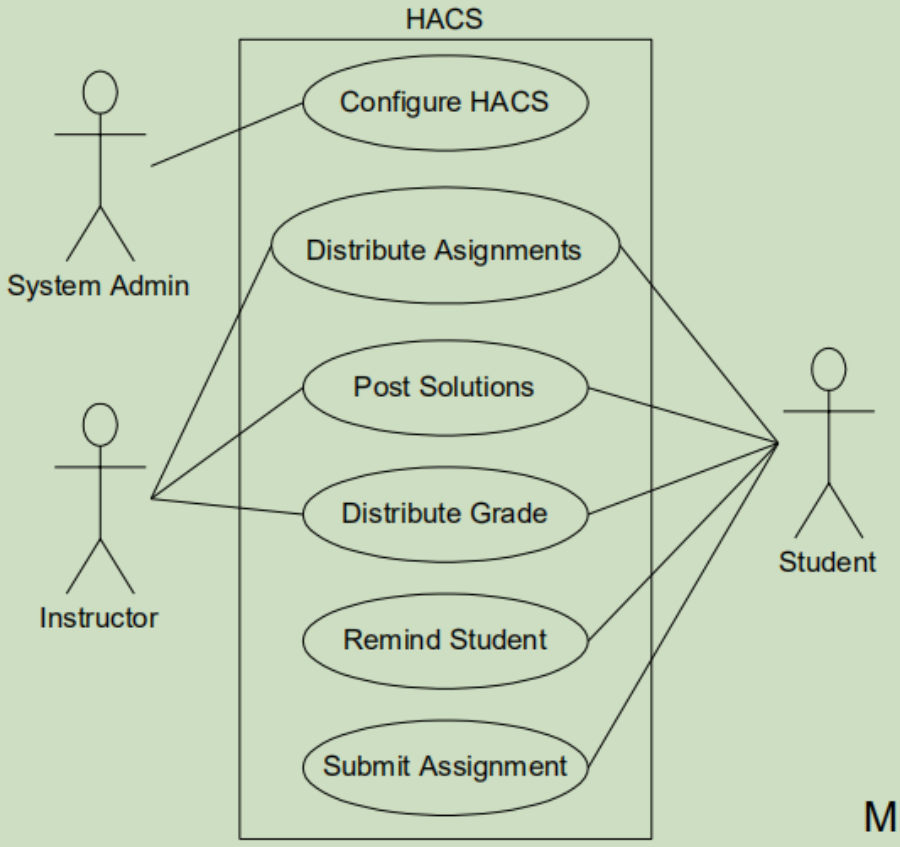
Use case diagram


Actor
Browse Catalog and Select Items
Call Sales Person
Customer
Give Shipping Info
Give Payment Info
Use case
Get Confirmation #


HACS
Configure HACS
Remind Student
System Admin
Distribute Asignments
Get Assignment
Post Solutions
Submit Assignment
Student
Distribute Grade
Get Solution
Instructor
Get Grade
MH

Use case:	**Distribute Assignments**
Actors:	Instructor (initiator)
Type:	Primary and essential
Description:	The Instructor completes an assignment and submits it to the system. The instructor will also submit the due date and the class the assignment is assigned for.
Cross Ref.:	Requirements XX, YY, and ZZ
Use-Cases:	*Configure HACS* must be done before any user (Instructor or Student) can use HACS

Alternate HACS

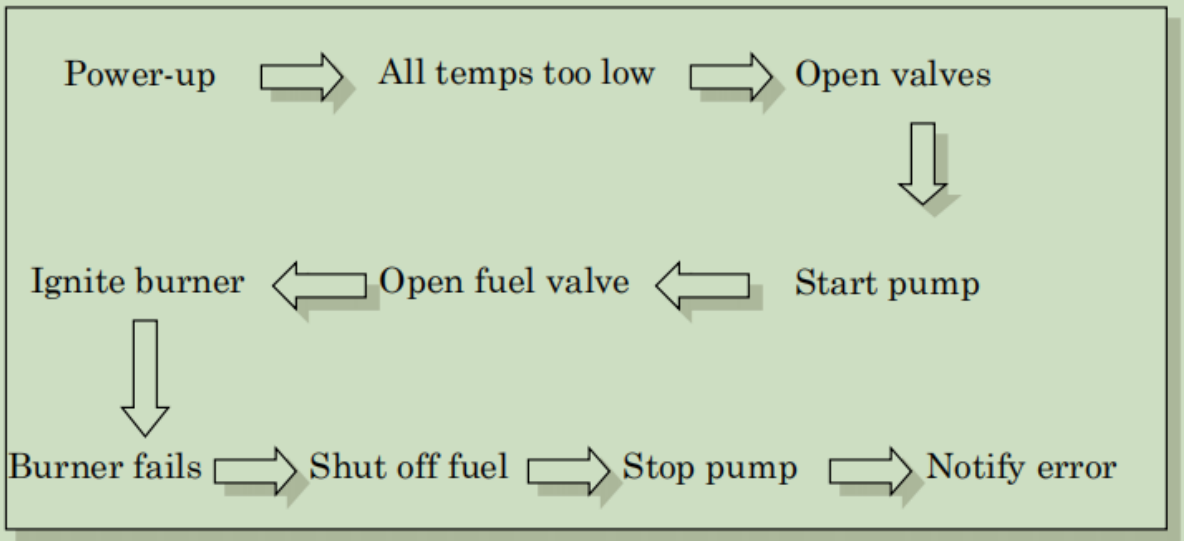


MH

Alternate HACS Use-Cases

Use case:	**Distribute Assignments**
Actors:	Instructor (initiator), Student
Type:	Primary and essential
Description:	The Instructor completes an assignment and submits it to the system. The instructor will also submit the delivery date, due date, and the class the assignment is assigned for. The system will at the due date mail the assignment to the student.
Cross Ref.:	Requirements XX, YY, and ZZ
Use-Cases:	*Configure HACS* must be done before any user (Instructor or Student) can use HACS

Scenarios -- One Use Case

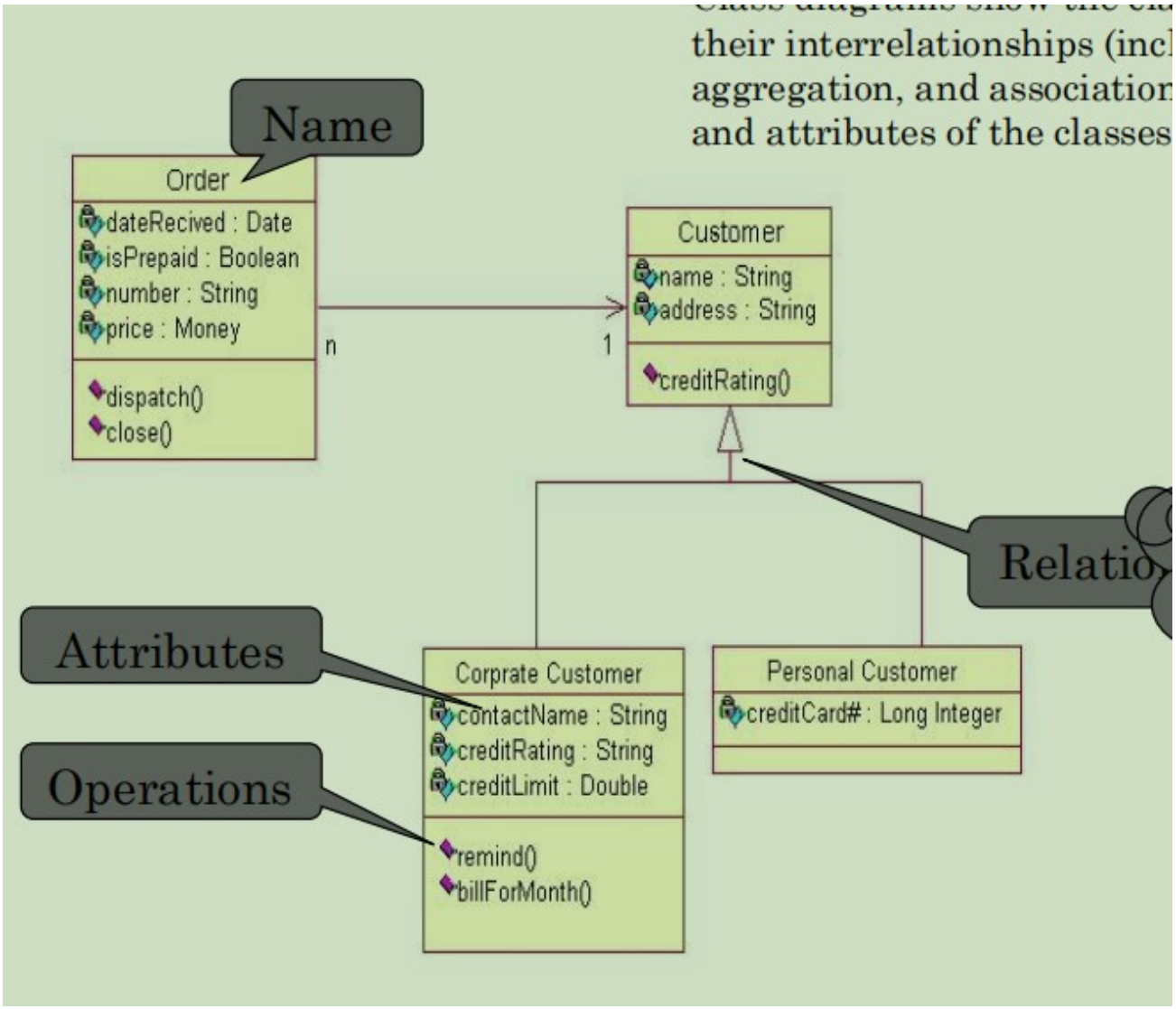


Class diagram

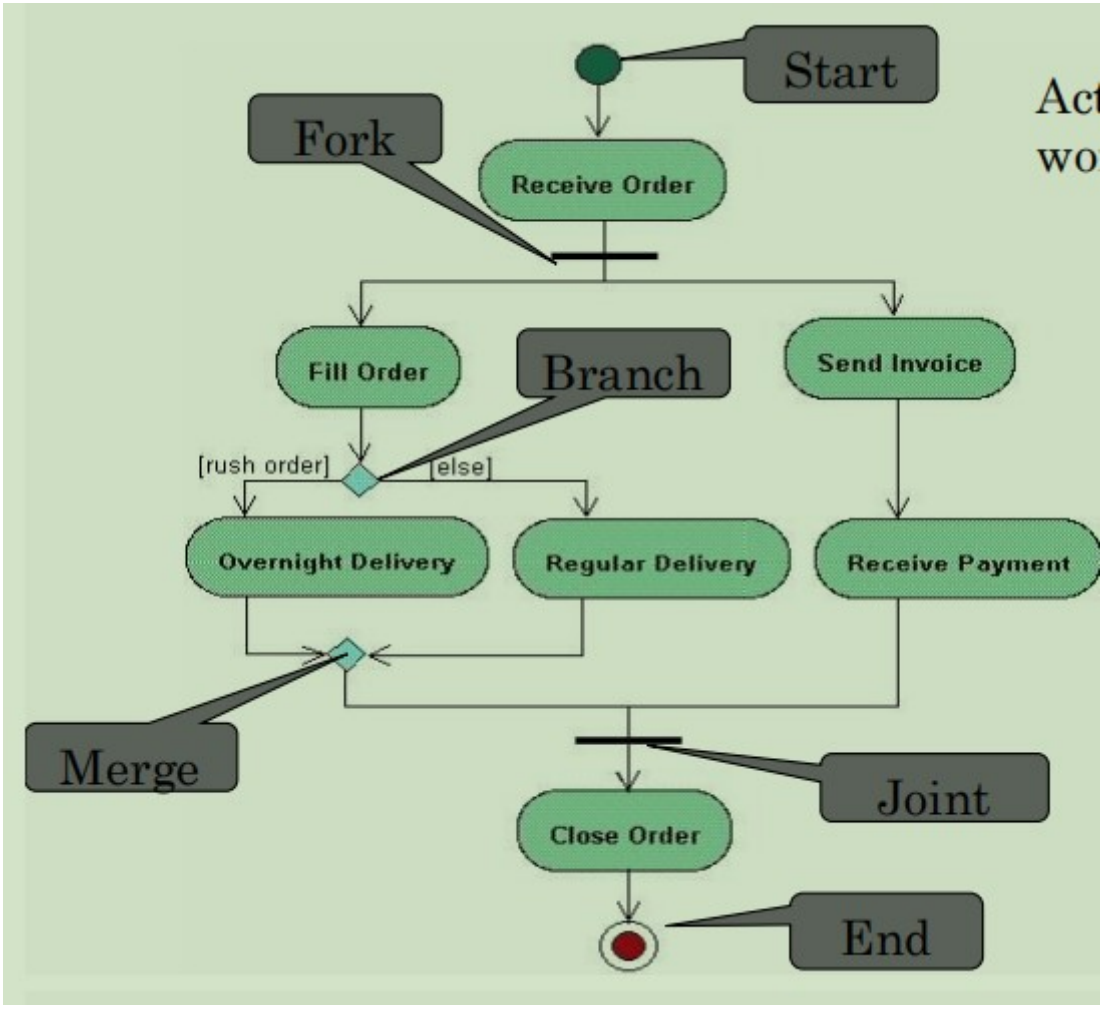
- **Association**
  - *There is an association between two classes if an instance of one class must known about the other in order to perform its work. In diagram, it is a link connecting two classes*
- **Aggregation**

- https://www.jianshu.com/p/43f770945ff4
- *an association in which one class belongs to a collection. It has a diamond ending pointing to the part containing the whole*

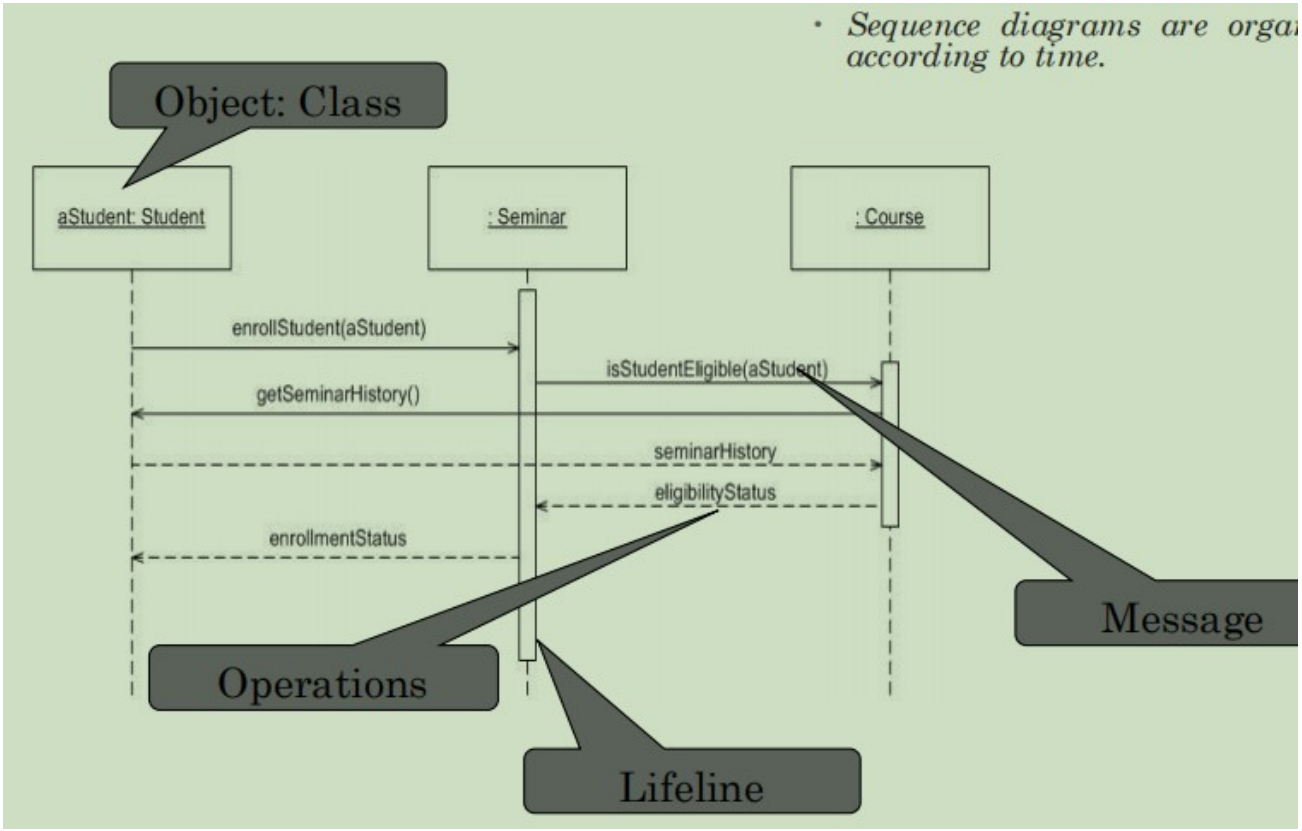
- **Generalization**
  - *an inheritance link indicating one class is a superclass of the other. It has a triangle pointing to the superclass*



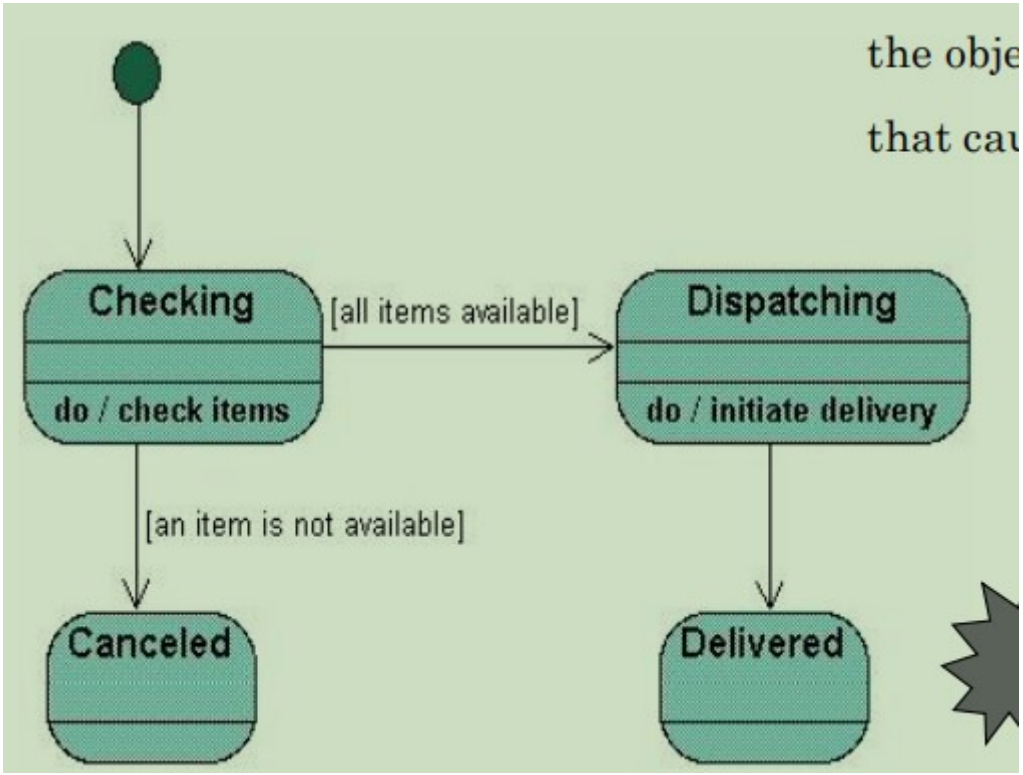
Activity diagram



Sequence diagram



State Machine diagram



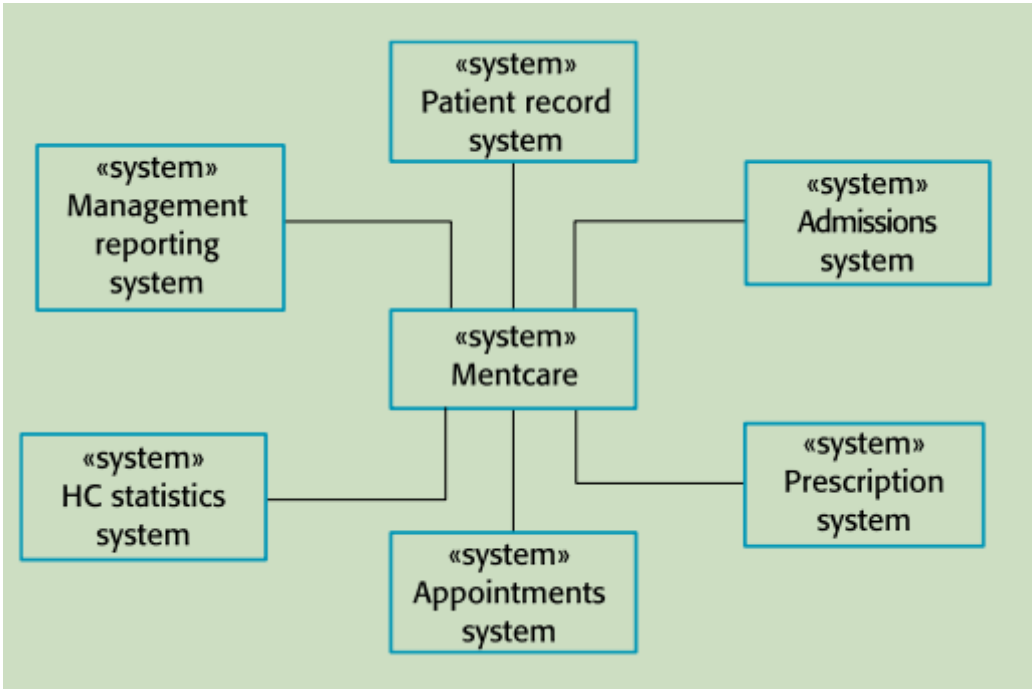
L6 System Modeling

- **System modeling** is the process of developing abstract models of a system, with each model presenting a different view or perspective of that system.

Context models

- **Context models** are used to illustrate the operational context of a system - they show what lies outside the system boundaries
  - **System boundaries** are established to define what is inside and what is outside the system. *They show other systems that are used or depend on the system being developed*
- Architectural models show the system
- Process perspective
  - Context models simply show how other systems in the environment, not how the system being developed
  - Process models reveal how the system being developed is used in broader business processes
    - activity diagrams may be used

- The context of the Mentcare system

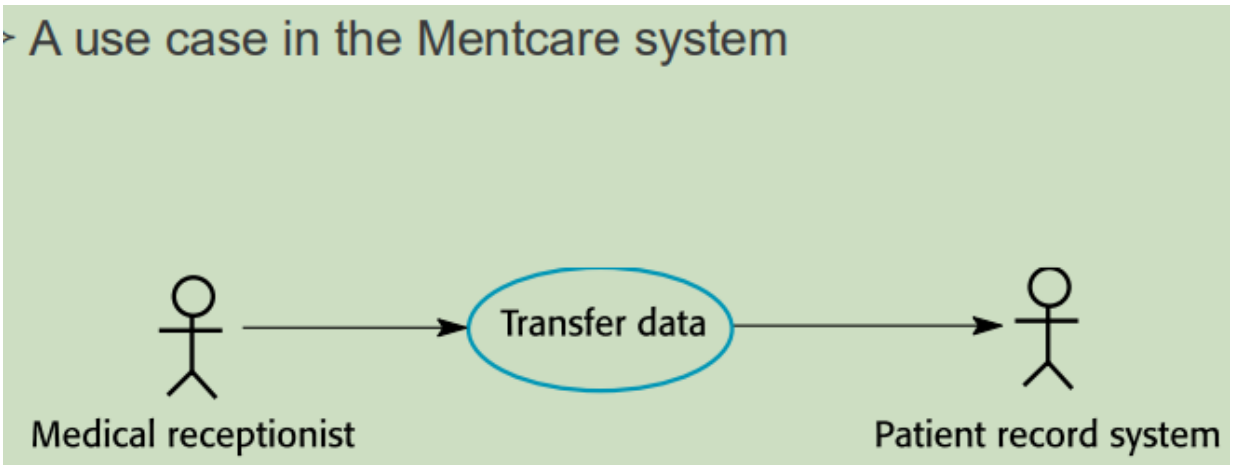


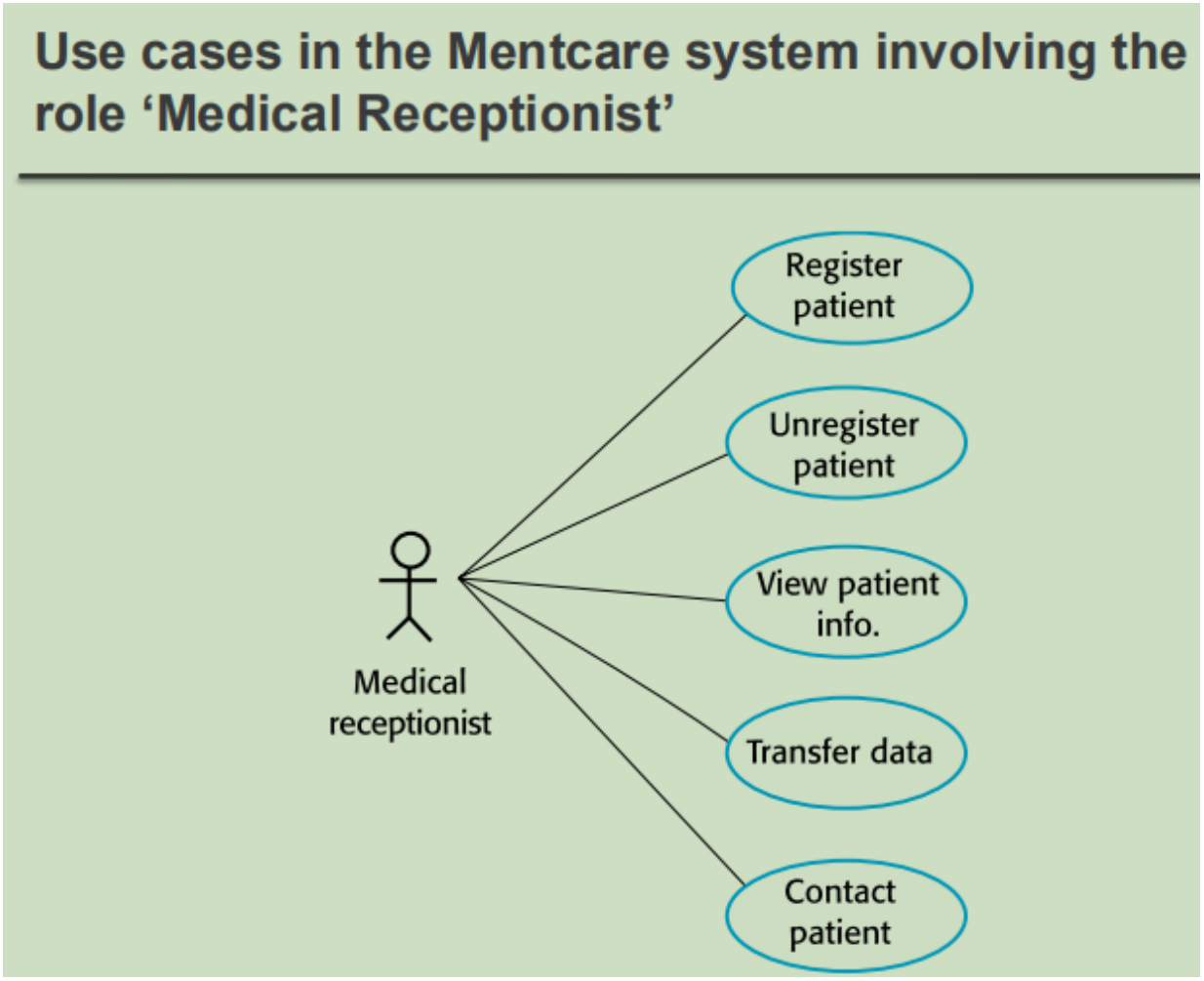
Interaction models

- *Use case diagram and sequence diagrams* may be used for it

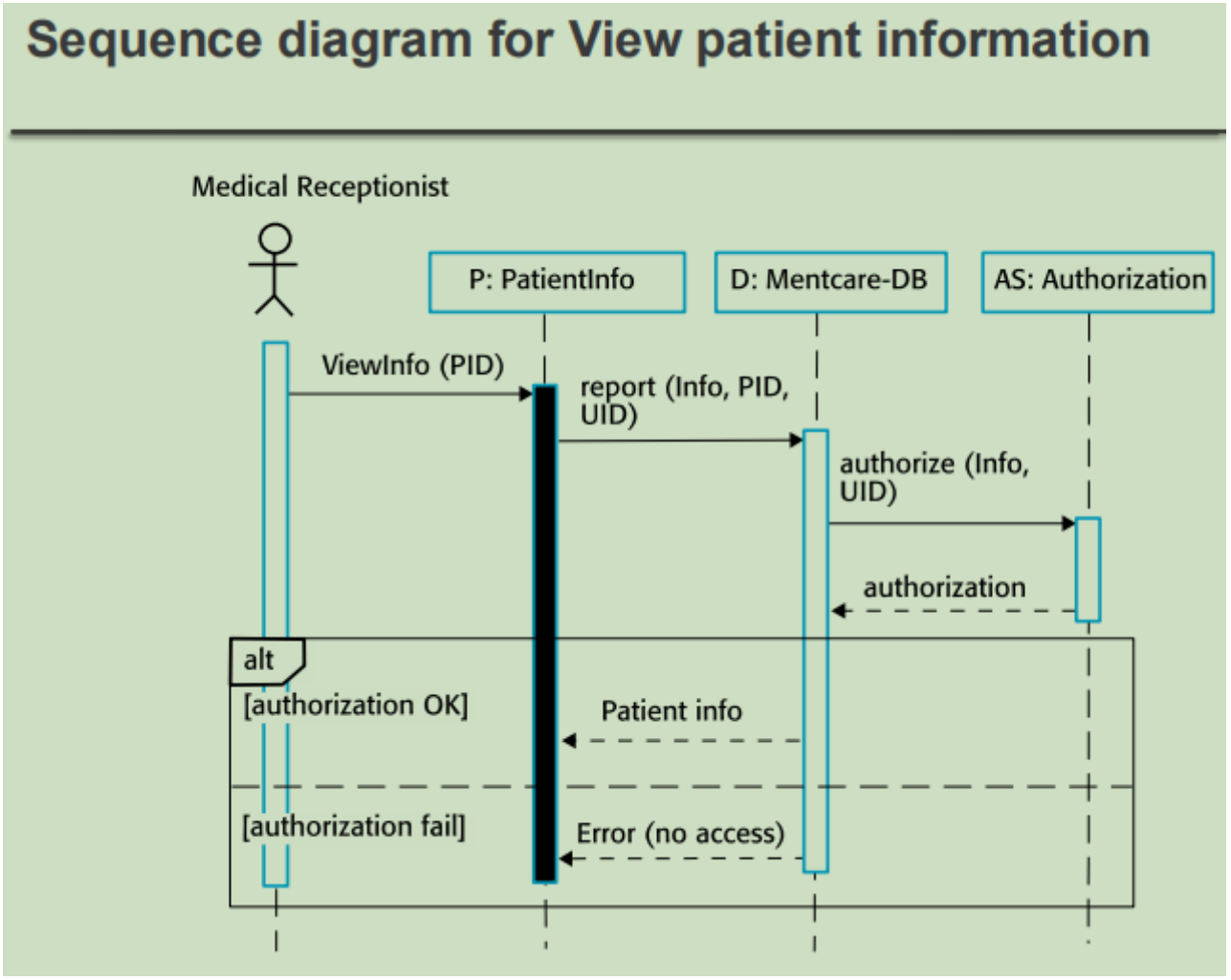
Use case modeling

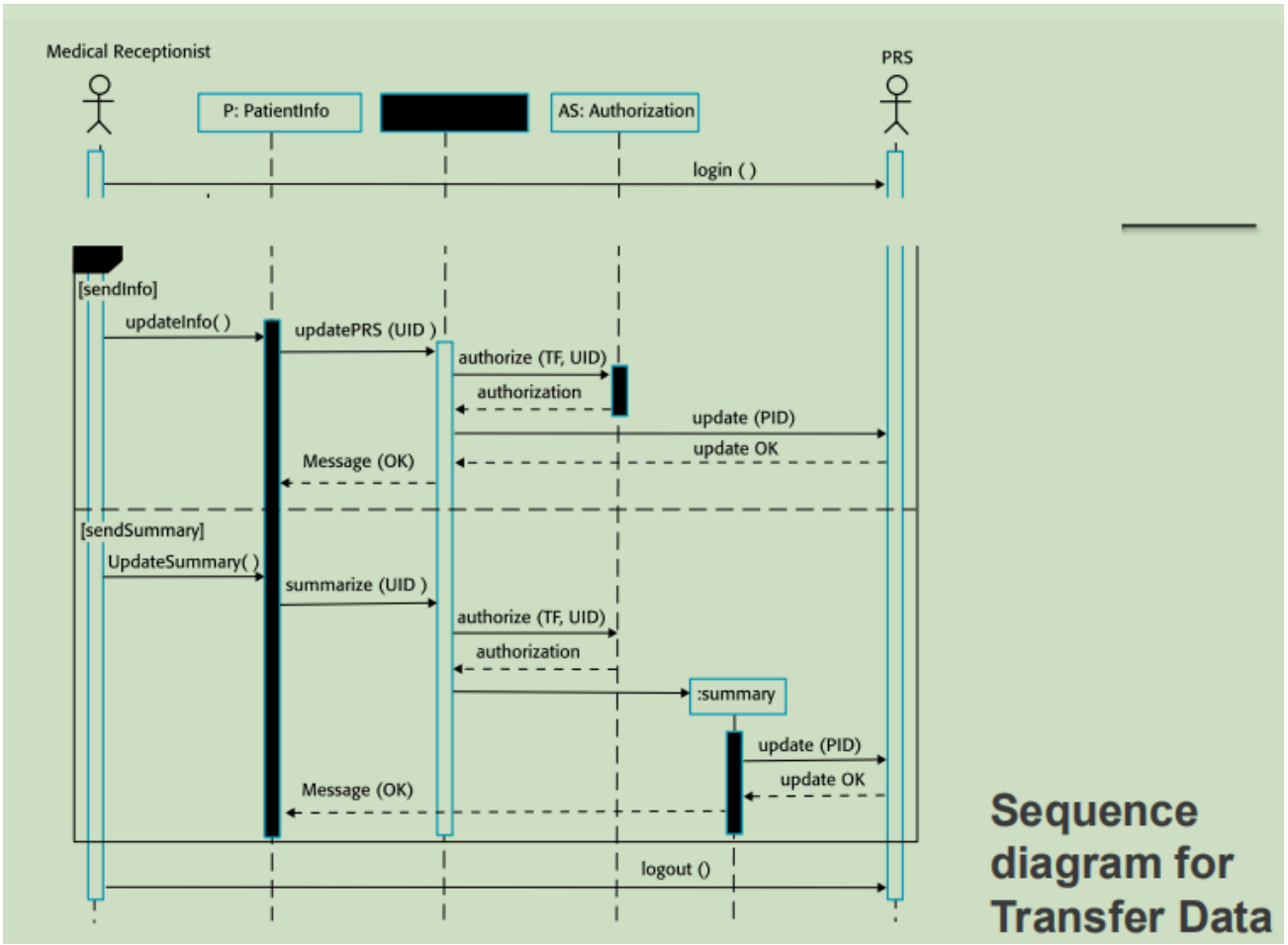
- Actors in a use case may be people or other systems





Sequence diagrams



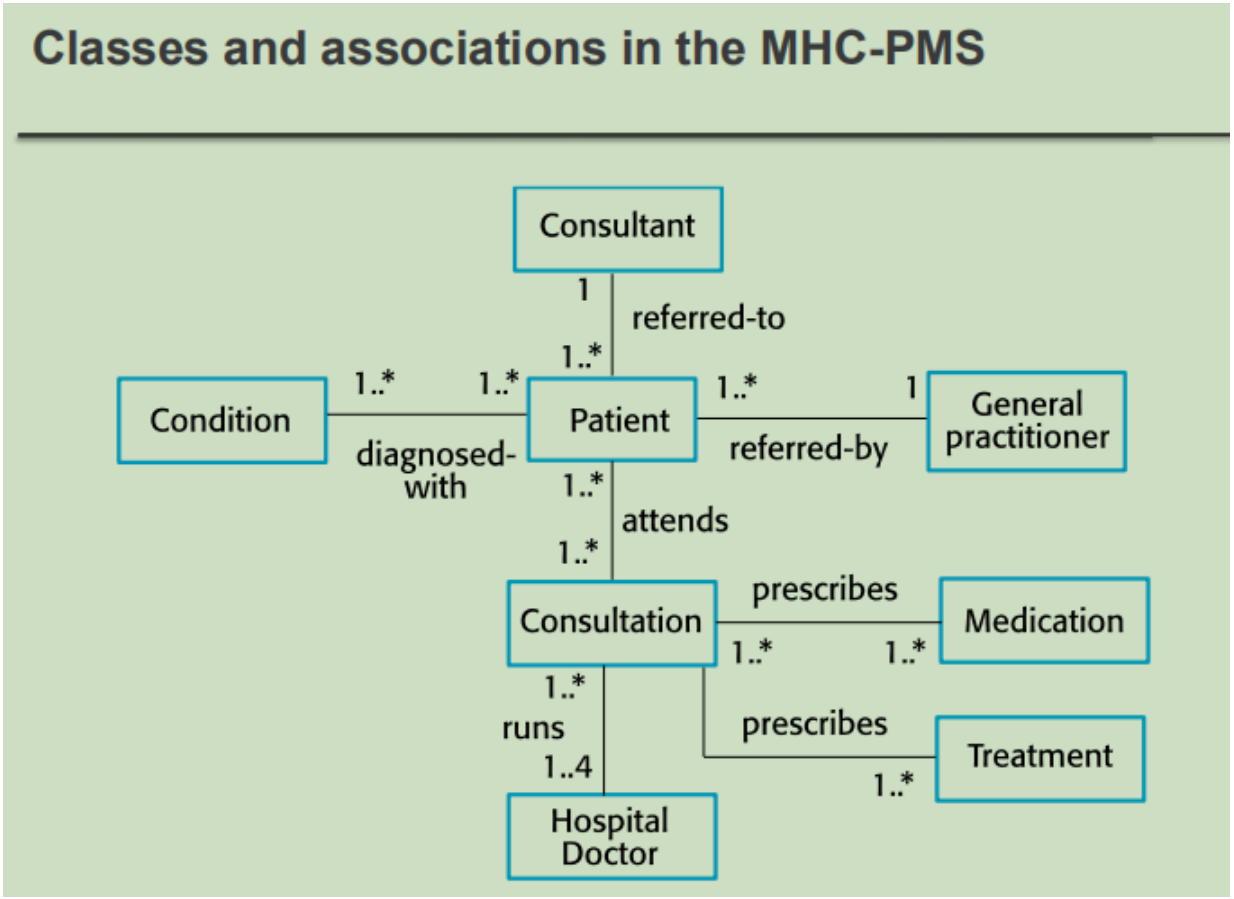


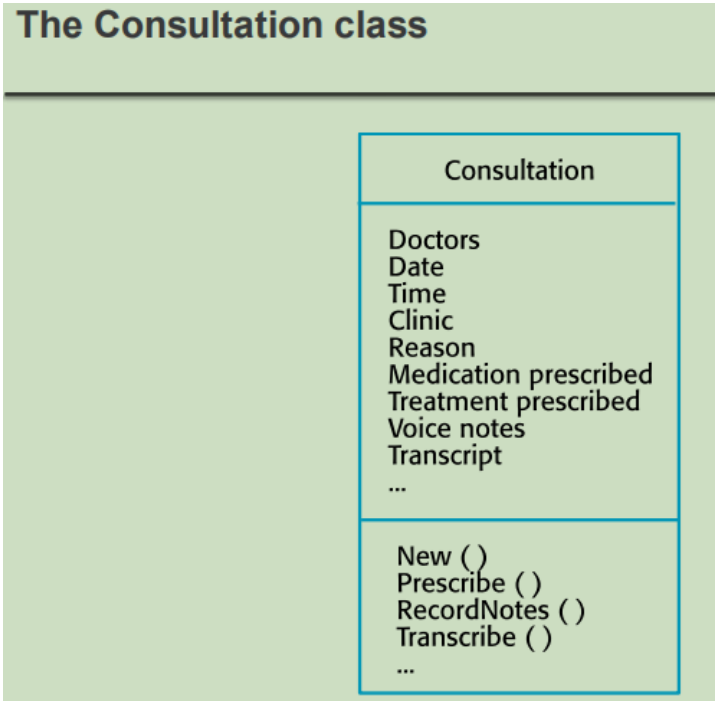
Structural models

- **Structural models** of software display the organization of a system in terms of the components that make up that systme and their relationships
- It may be static models, which show the structure of the system design, or dynamic models, which show the orgranization of the system when it is executing
- When you are discussing and designing the system structure

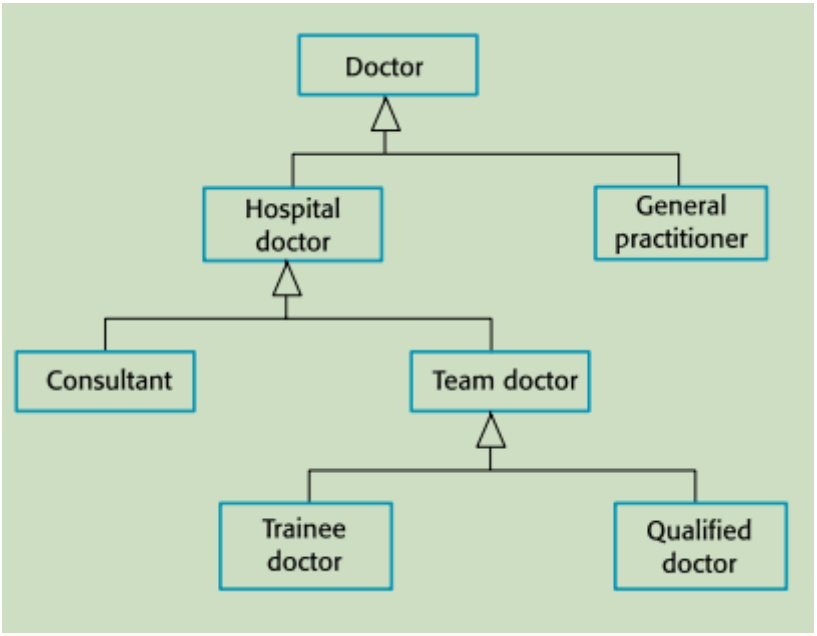
Class diagrams

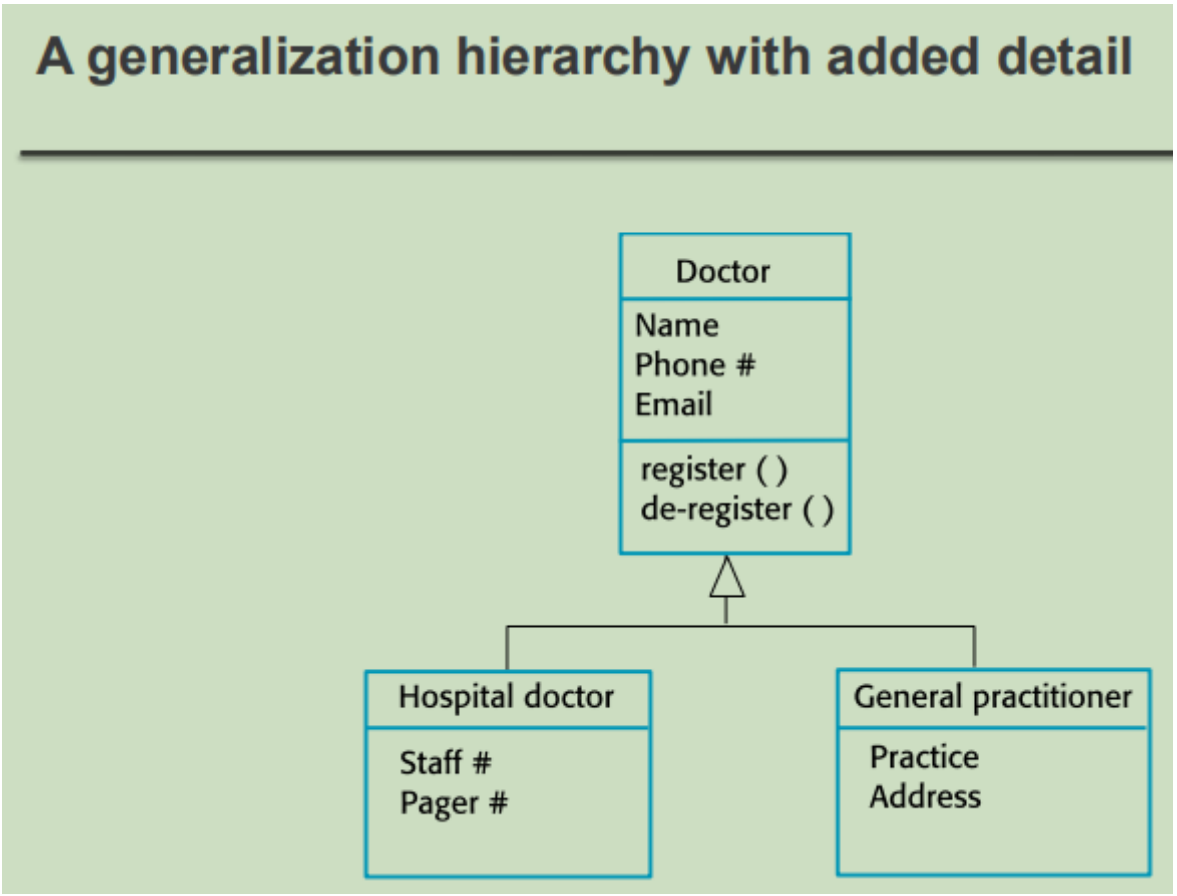
- It is used when developing an object-oriented system model to show the classes in a system and the associations between these classes.





Generalization





- An aggregation model shows how classes that are collections are composed of other classes

Behavioral models

- **Behavioral models** are models of the dynamic behavior of a system as it is executing. They show what happends or what is supposed to happen when a system responds to a stimulus from its environment.
- Stimuli (刺激)
  - Data: Some data arrives that has to be processed by the system.

    - Events: Some event happens that triggers system processing. Event may have associated data, althgough this is not always the case.

- Data-driven modeling
    - It show the sequence of actions involved in processing input data and generating an associated output.

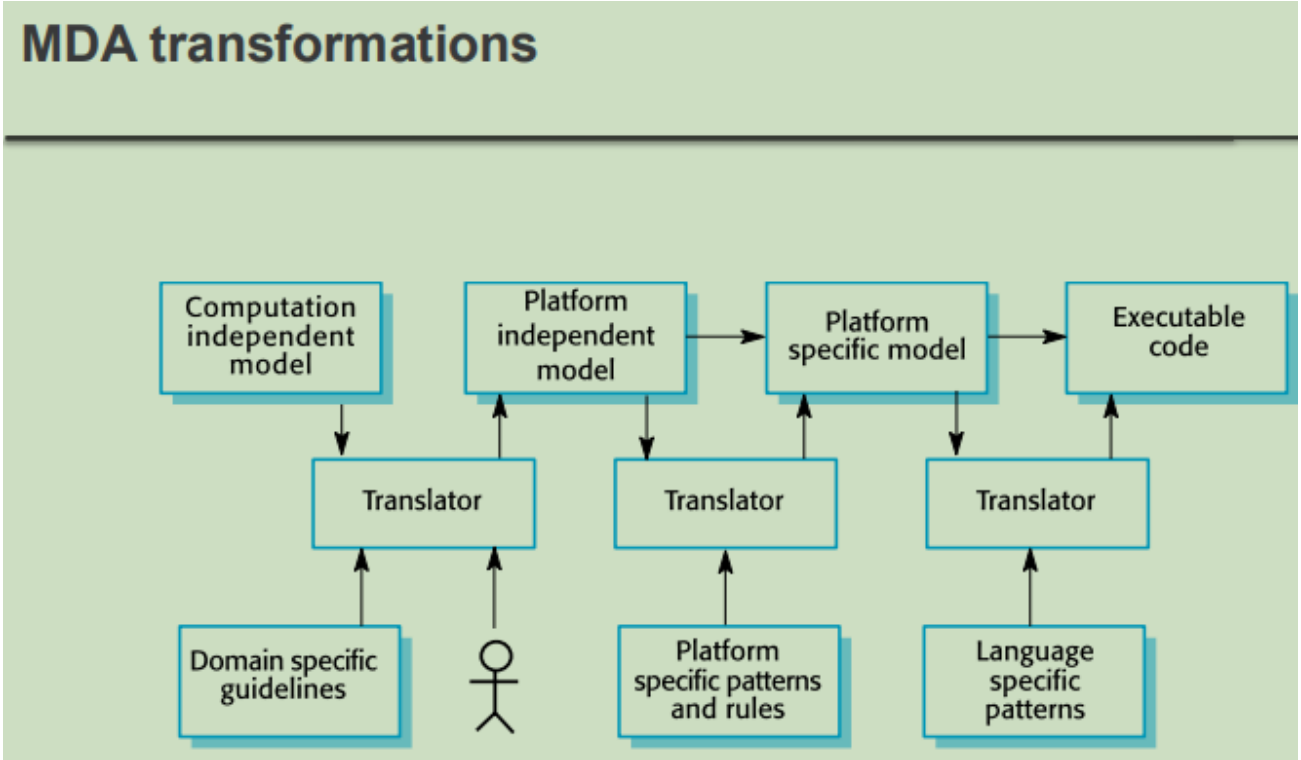
- Event-dirven modeling
    - Real-time systems are ofthen event-driven, with minimal data processing. e.g. landline phone switching system
    - It shows how a system responds to external and internal events

- State machine models
    - These model the behaviour of the system in response to external and internal events
    - Often used for modeling real-time systems.

Model-driven engineering

- Model-driven engineering (MDE) is an approach to software development where models rather than programs are the principal outputs of the development process.
- 优点：允许在更高的抽象级别上考虑系统；自动生成代码意味着系统适应新平台的成本更低
- 缺点：模型用于抽象，实现不一定正确；the costs of developing translators for new platforms is high.

Model driven architecture (MDA)



Key Points

- A model is an abstraction view of a system that ignores system details. Complementary system modles can be developed to show the system's context, interactions, structure and behavior
- Context models show how a system that is being modeled is positioned in an environment with other systems and processes.
- Use case diagrams and sequence diagrams are used to describe the interactions between users and systems in the system being designed. Use cases: system and external actors; sequence diagrams: add more information by interactions between system objects
- Structural models show the organization and architecture of a system. Class diagrams are used.
- Behavioral models are used to describe dynamic behavior of an executing system. This behavior can be modeled from the perspective of the data processed by the system, or by the events that stimulate responses from a system.
- Activity diagrams may be used to model the processing of data
- State diagrams are used to model a system's behavior in response to internal or external events
- Model-driven engineering is an approach to software development in which a system is reprensented as a set of models that can be automatically transformed to executable code.