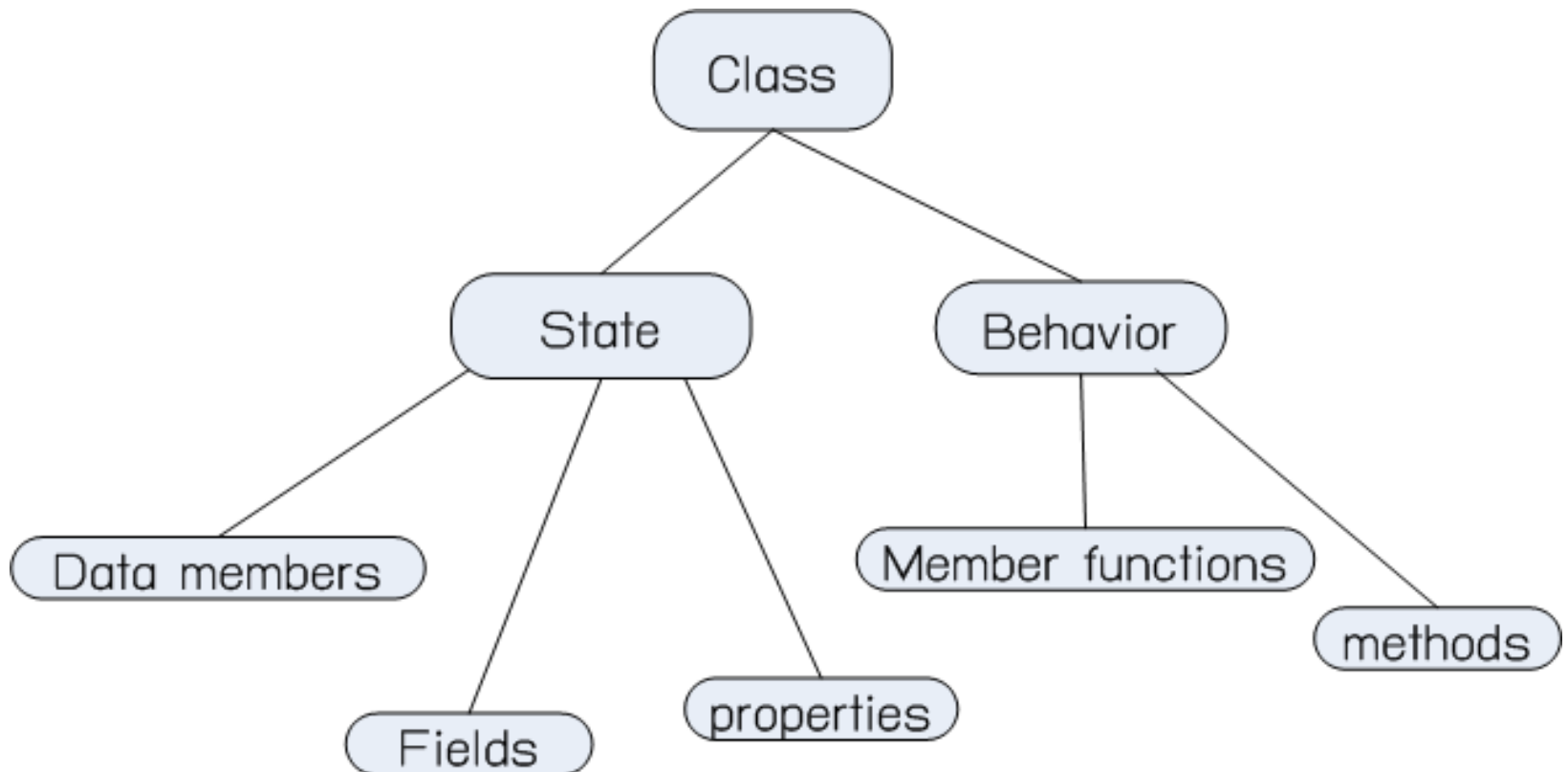


วัตถุในภาษา UML

Objects

Objects คือ instance ของ class



Building Models

Real world object



Abstractions

Model



The goal of the model is to create a meaningful abstraction of the real world.

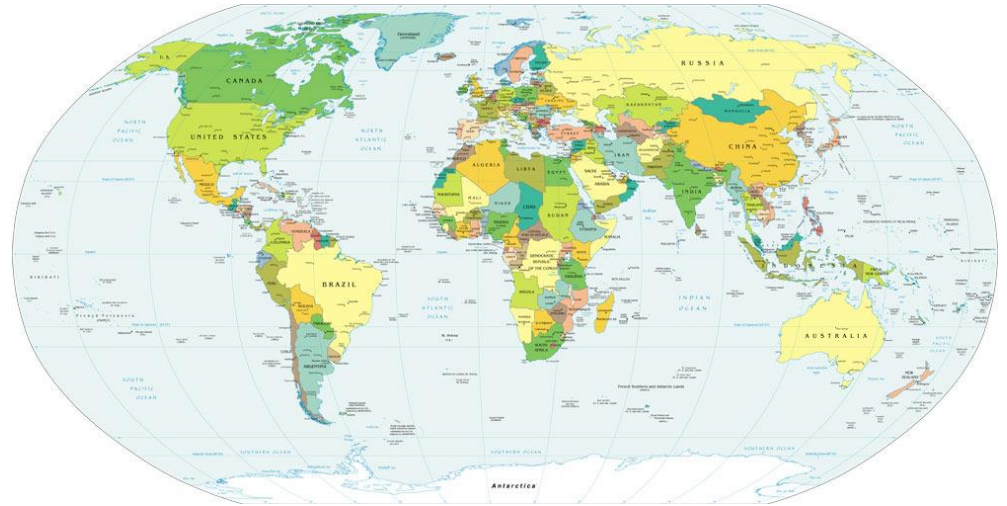
Object Models

- An abstraction should be simpler than the real world.
- Should accurately reflect the real world behaviors.
- We can use the model to predict the behavior of things in the real world.

Elements of the Object Model

1. Procedure-oriented
 - Algorithms
2. Object-oriented
 - Classes and objects
3. Logic-oriented
 - Goals, often expressed in a predicate calculus
4. Rule-oriented
 - If-then rules
5. Constraint-oriented
 - Invariant relationships

The earth – the classic model – The map



State and Behaviors of Real World.



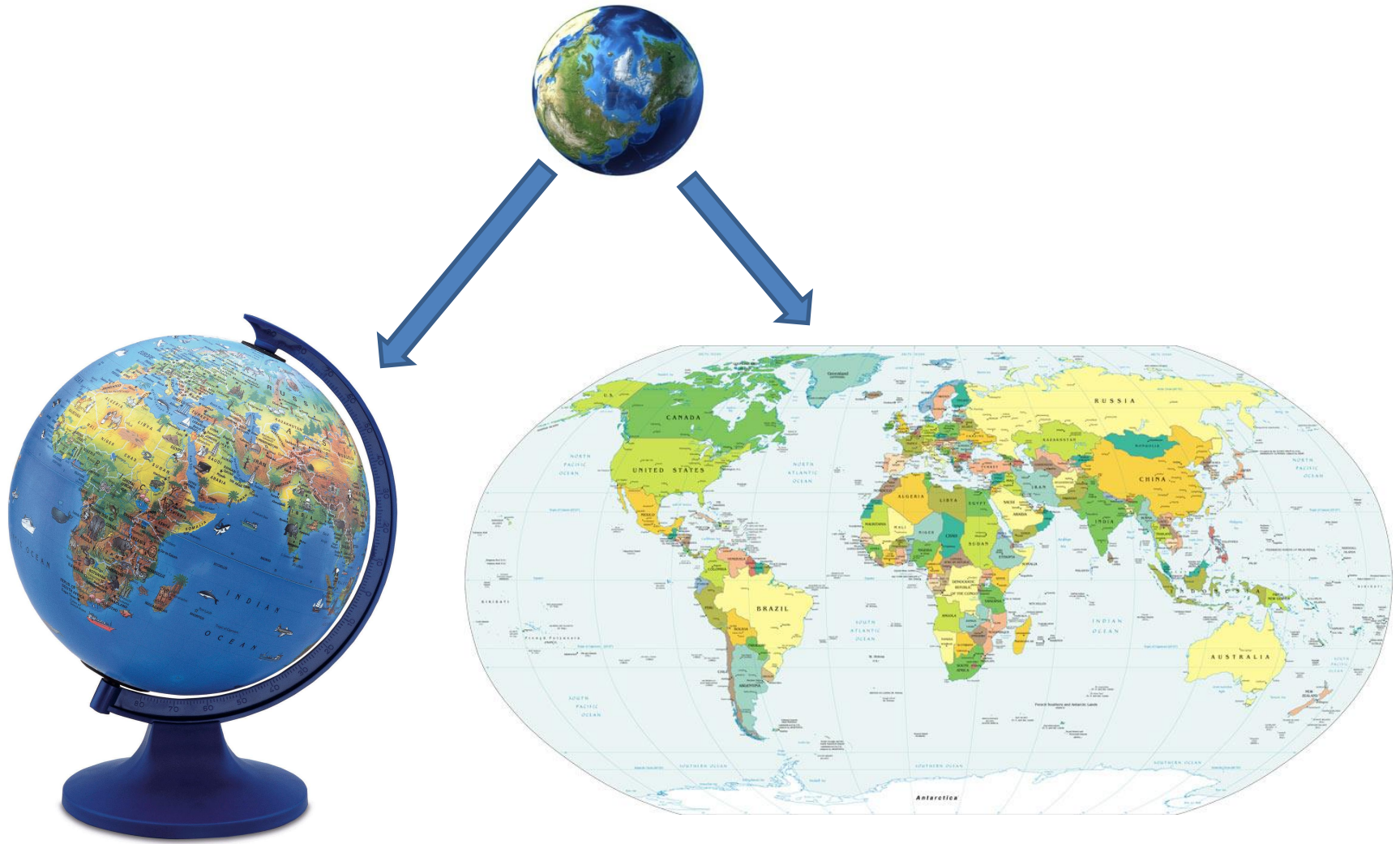
- Rain
- Flood
- Quakes
- Strike of lightning
- Tornado
- Day-night
- Sun/moon -- rise/set
- Etc.

State and Behaviors of the globe



- Finding distance
- Simulate day/night
- Locate any Location on the Earth

Different point of usage.



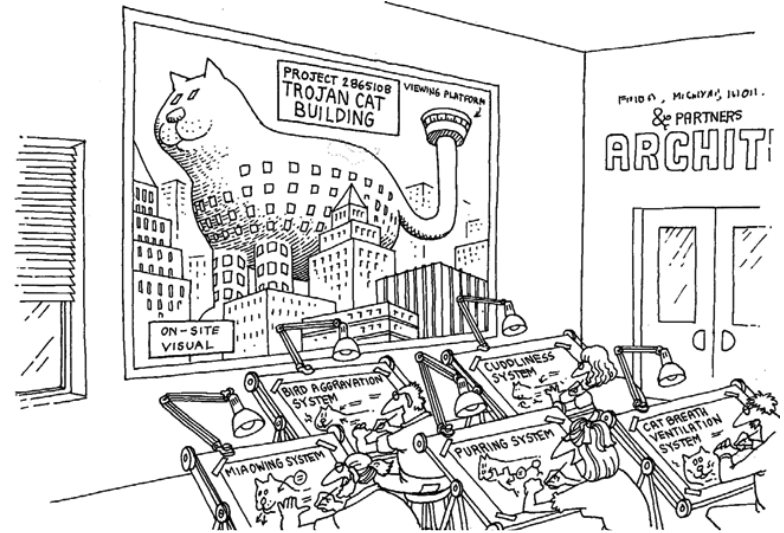
Exercise

จงเขียน State and Behaviors ของ objects ที่เห็นใน slide



Attributes of Complex system

- ทุกๆ complex system จะมี attribute ร่วมกัน 5 อย่าง
 - Hierarchic Structure
 - Relative Primitives
 - Separation of Concerns
 - Common Patterns
 - Stable Intermediate Forms



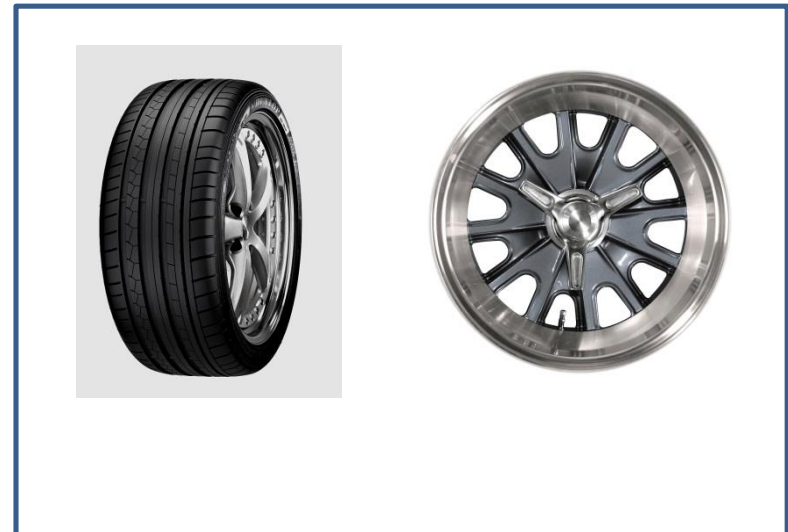
Relative Primitives

- มี object ที่เกี่ยวข้องกันรวมอยู่เป็น complex system
- ขึ้นอยู่กับมุมมองและประสบการณ์ของผู้วิเคราะห์ระบบ



Separation of Concerns

- Complex system เป็นระบบที่ *decomposable*
- แต่บางครั้งก็เรียกว่า *nearly decomposable* เพราะ
ชิ้นส่วนทั้งหมดไม่สามารถแยกจากกันโดยเด็ดขาด

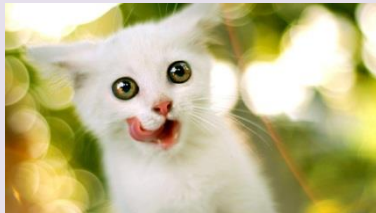


Separation of Concerns

- Intracomponent linkages
 - คือความเชื่อมโยงหรือเกี่ยวข้อภายในวัตถุ (ที่ประกอบด้วยวัตถุย่อยๆ)
- intercomponent linkages
 - คือความเชื่อมโยงหรือเกี่ยวข้อระหว่างวัตถุ

Common Patterns

- Hierarchic systems are usually composed of only a few different kinds of subsystems in various combinations and arrangements.
- Complex systems have common patterns.

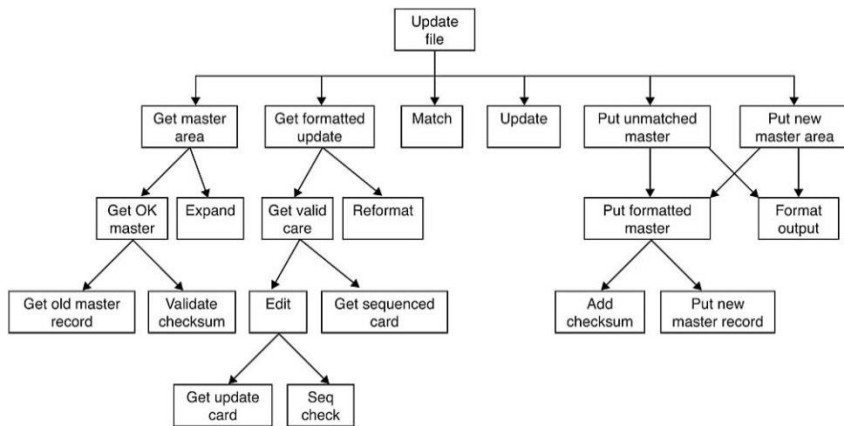


Stable Intermediate Forms

- A complex system designed from scratch never works and cannot be patched up to make it work.
- You have to start over, beginning with a working simple system.

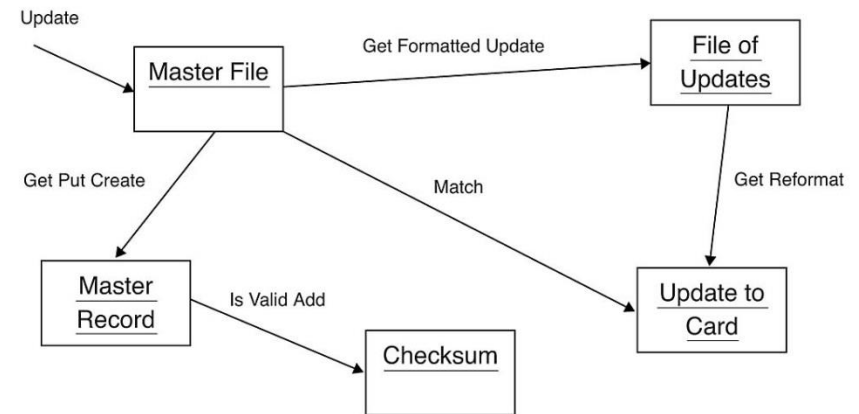
The Role of Decomposition

- **Algorithmic Decomposition**
 - **Structural design**



เน้นที่ลำดับการเกิด events

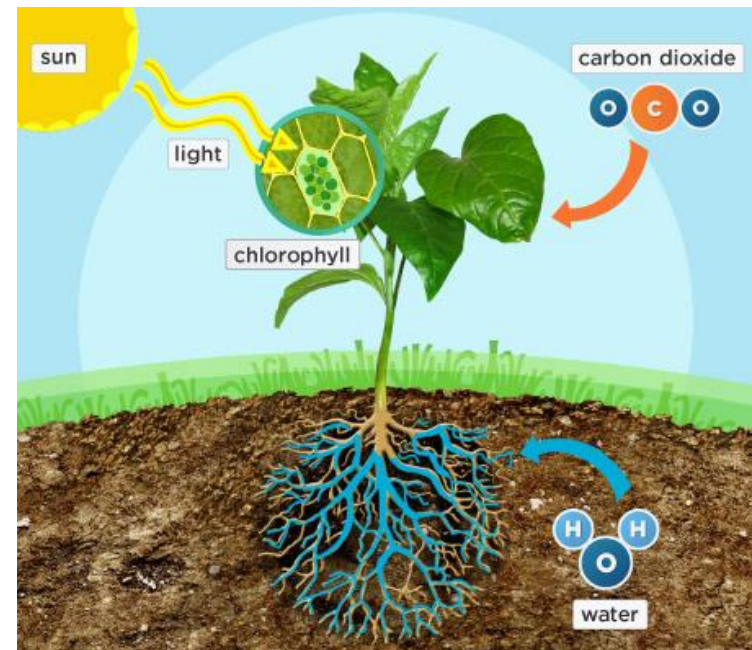
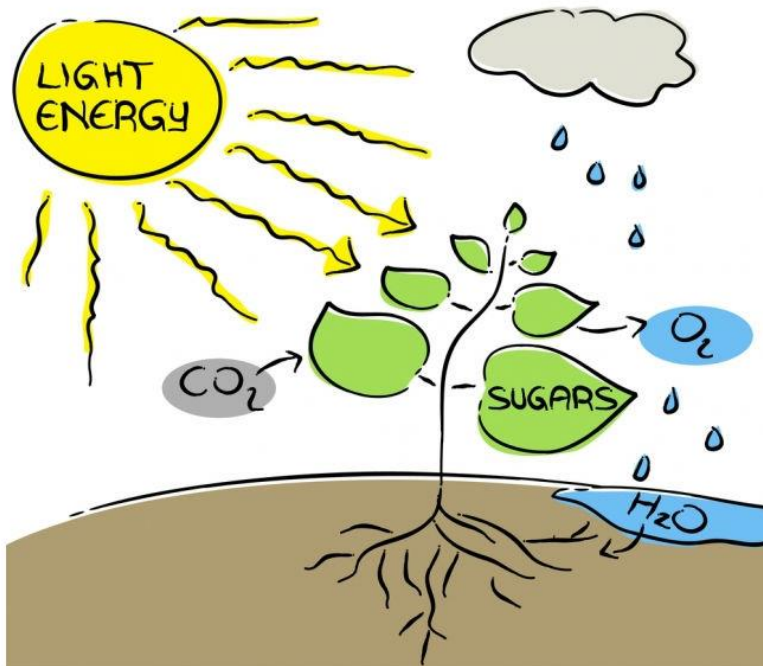
- ***Object-Oriented Decomposition***



เน้นที่ object ที่สร้าง events หรือ
Object ที่ตอบสนองต่อ events

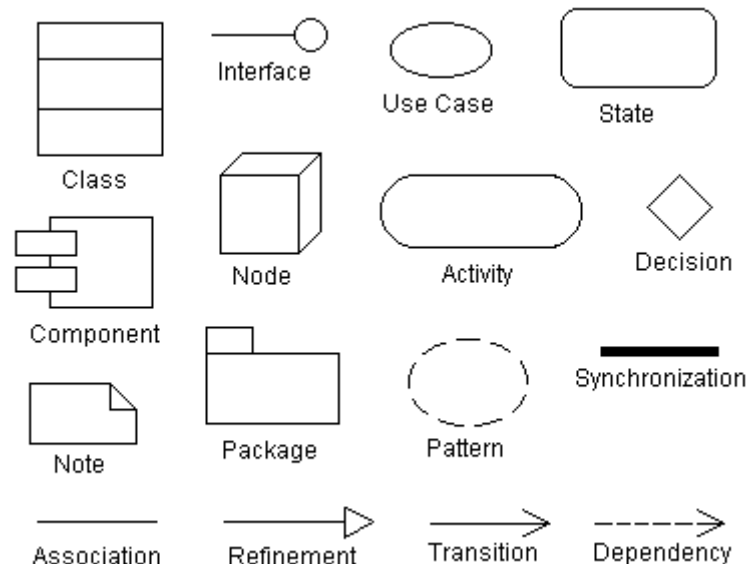
The Role of Abstraction

- จากการทดลองของ Miller พบว่า ในเวลาหนึ่งๆ คนเราสามารถเข้าใจหรือจดจำกับสิ่งต่างๆ ได้เพียง 7 ± 2 อย่าง
- ถ้ามี complexity มากๆ เราจะทำ abstract โดยอัตโนมัติ

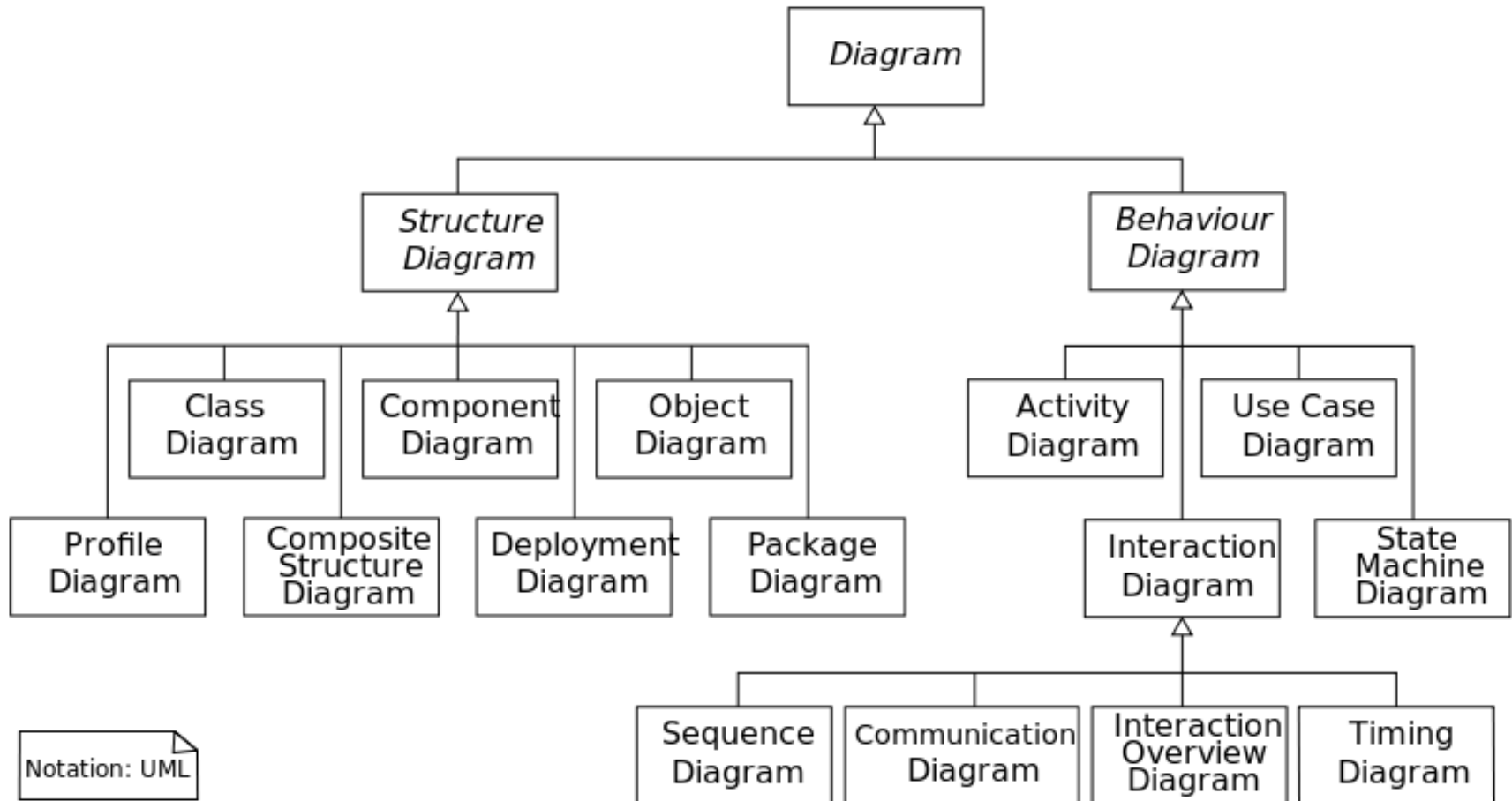


UML Objects

- Structural UML diagrams
 - Structure diagrams emphasize the things that must be **present** in the system being modeled
- Behavioral UML diagrams
 - Behavior diagrams emphasize what must **happen** in the system being modeled.



UML diagrams

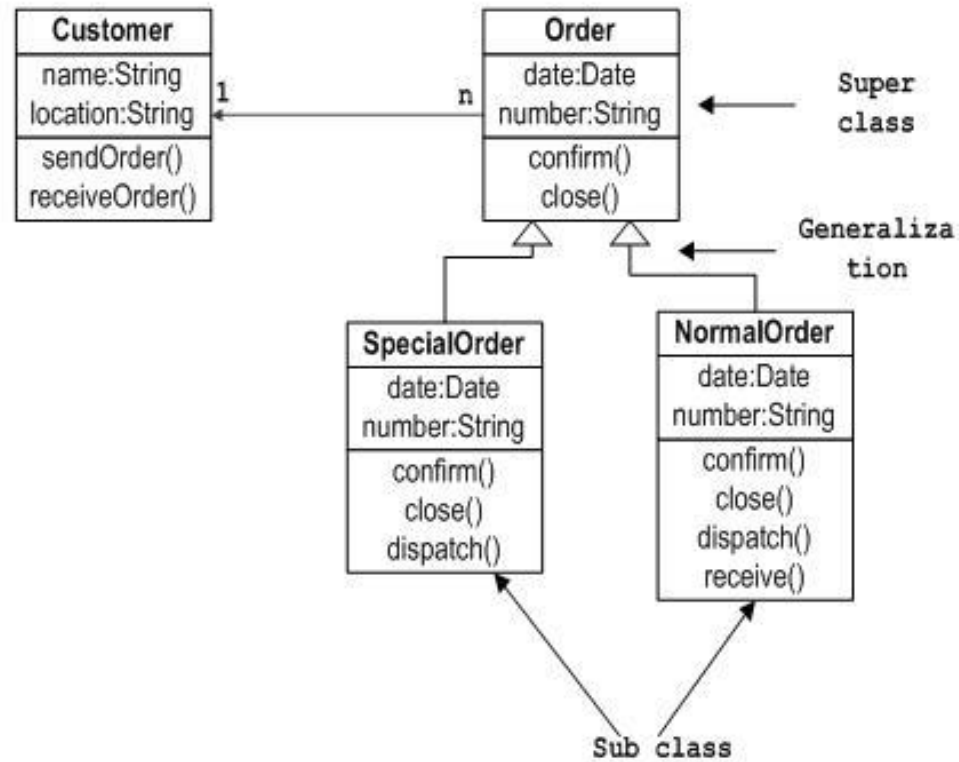


Structure diagrams

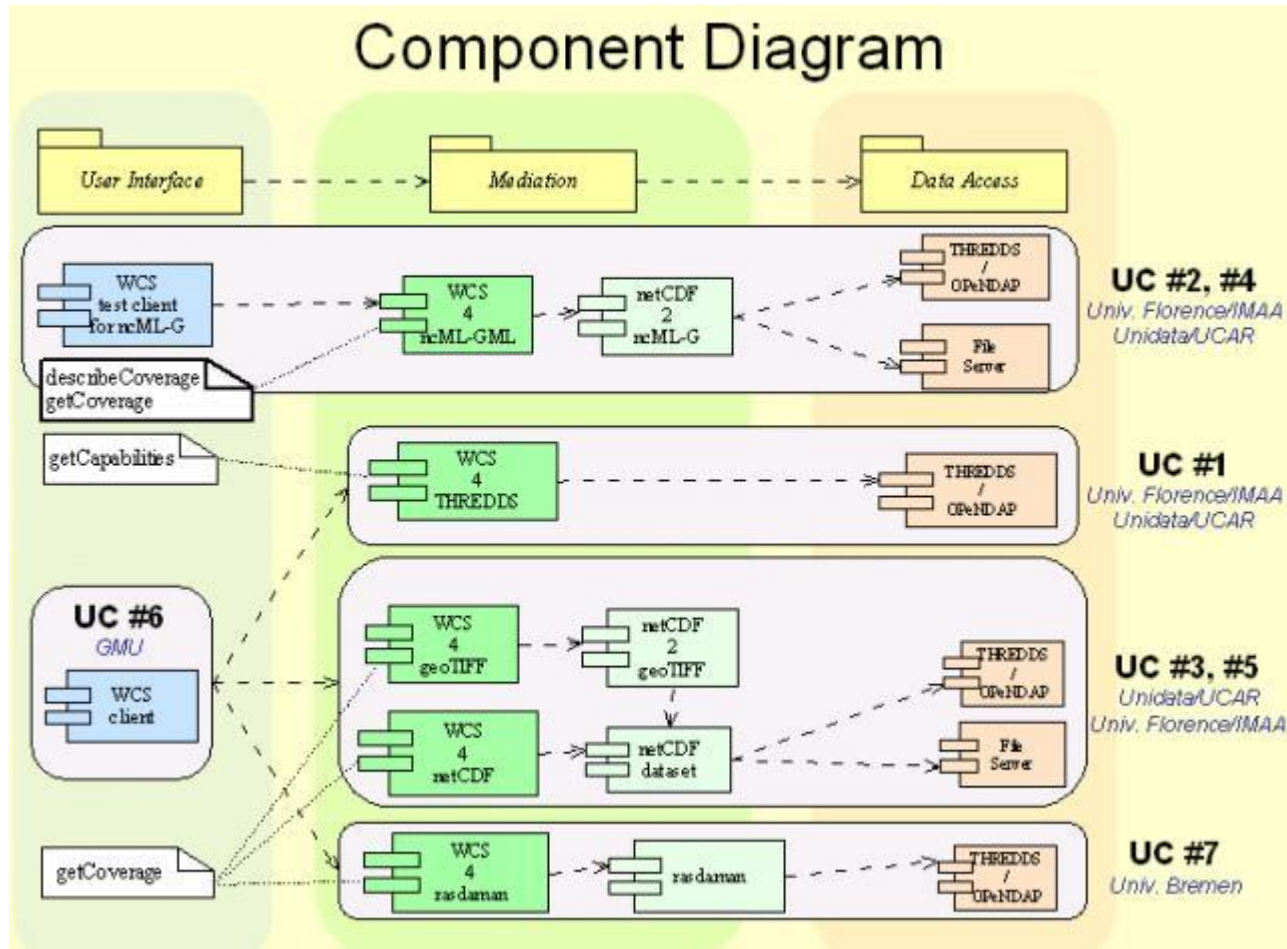
- Class diagram
- Component diagram
- Composite structure diagram
- Deployment diagram
- Object diagram
- Package diagram
- Profile diagram

Class diagram

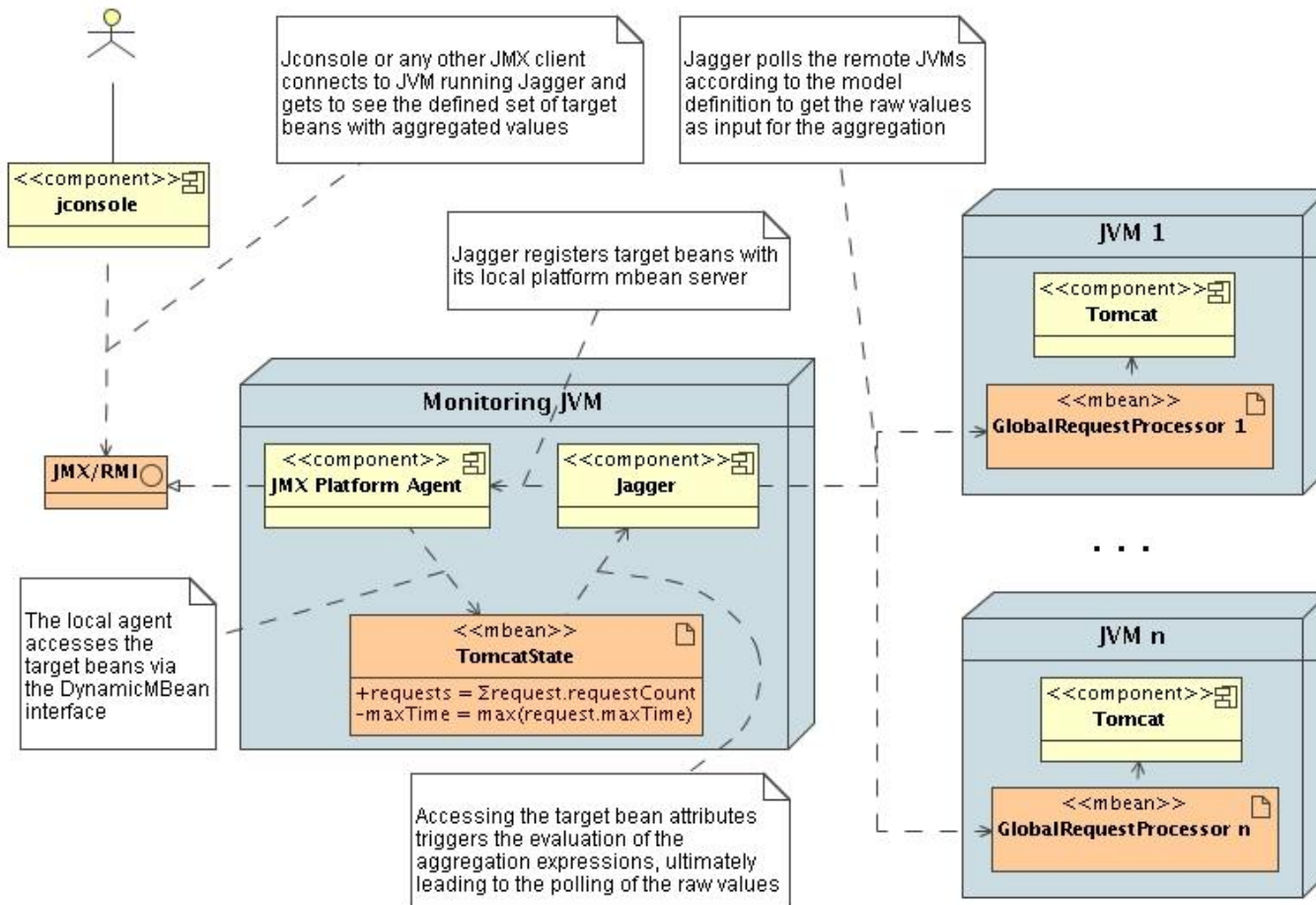
Sample Class Diagram



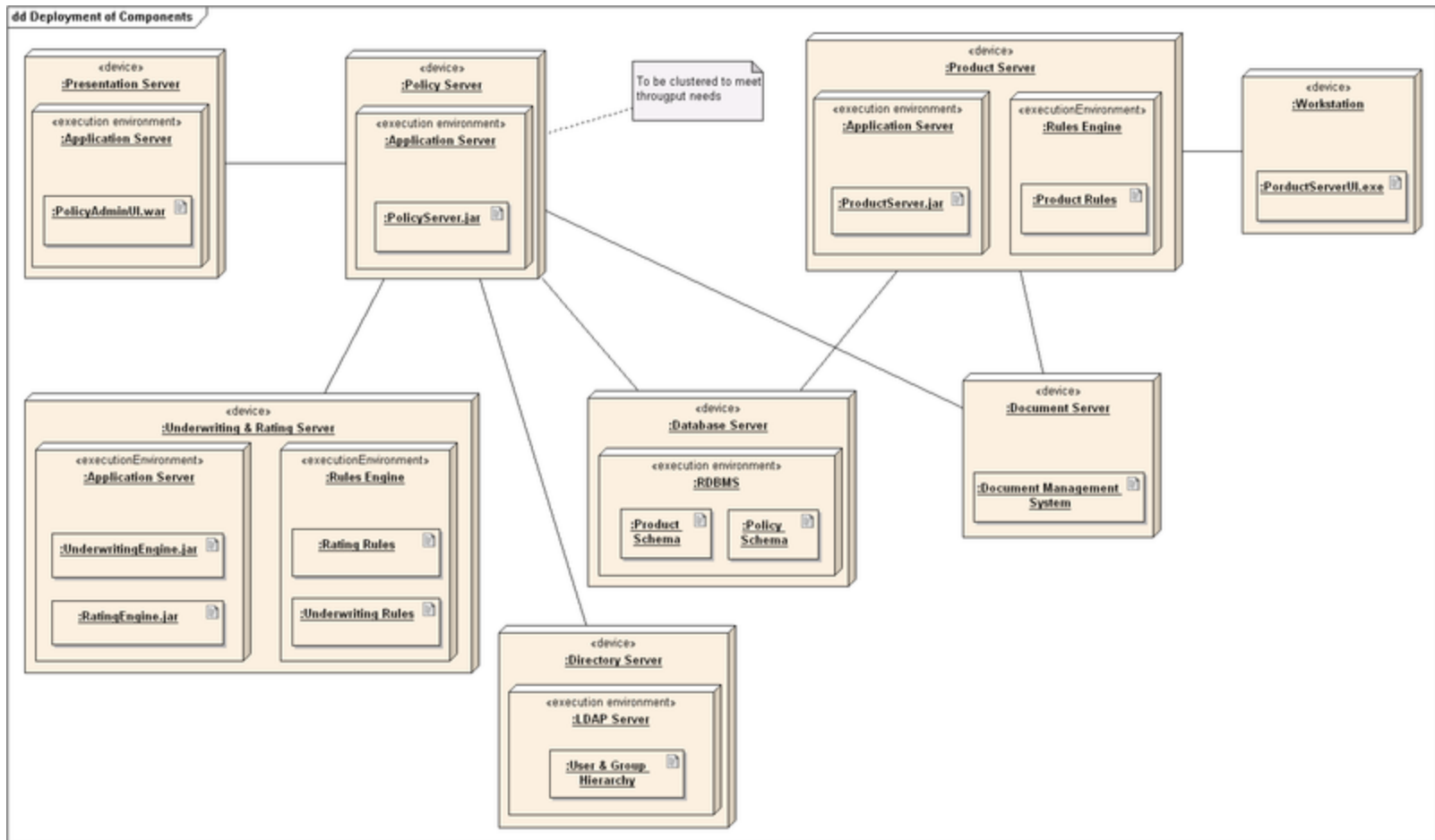
Component diagram



Composite structure diagram



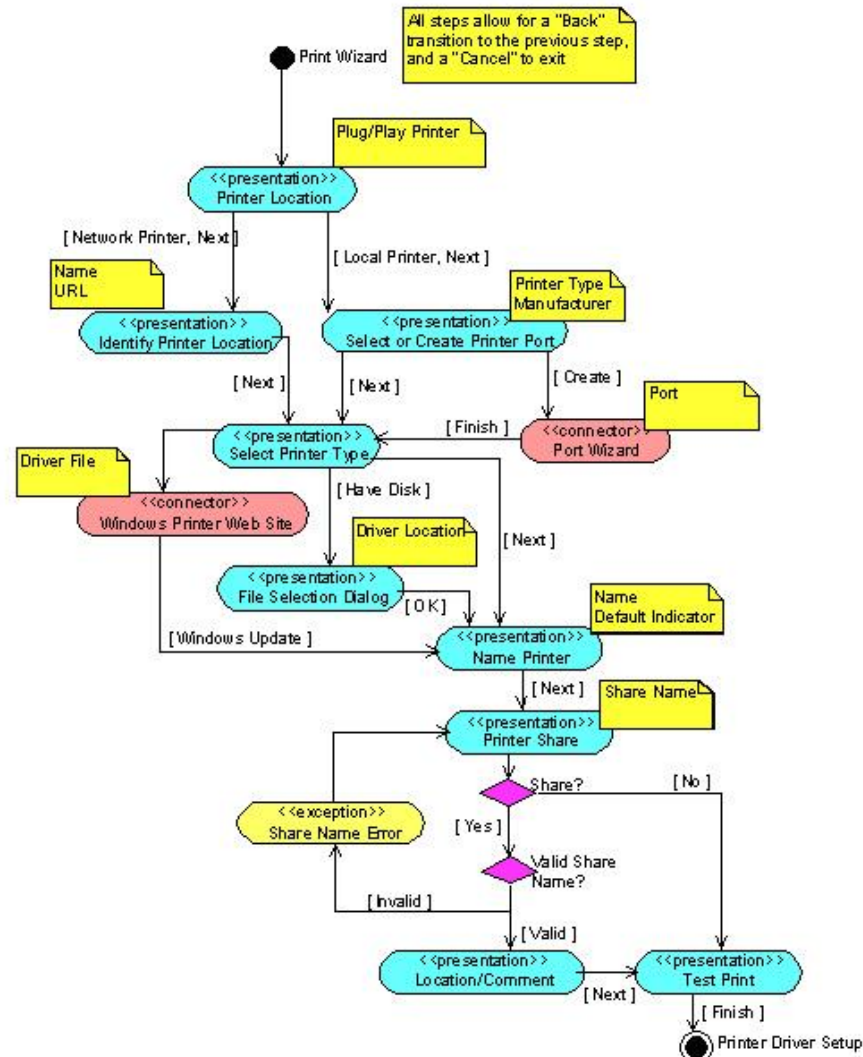
Deployment diagram



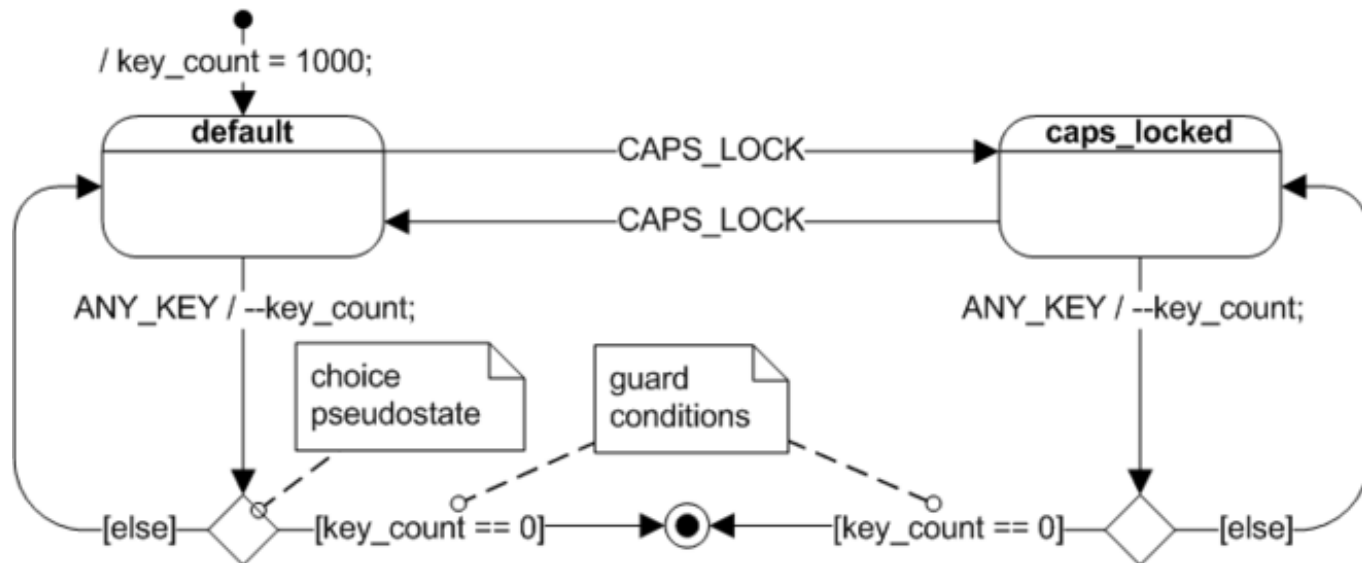
Behavior diagrams

- Activity diagram
- UML state machine
- Use Case Diagram

Activity diagram

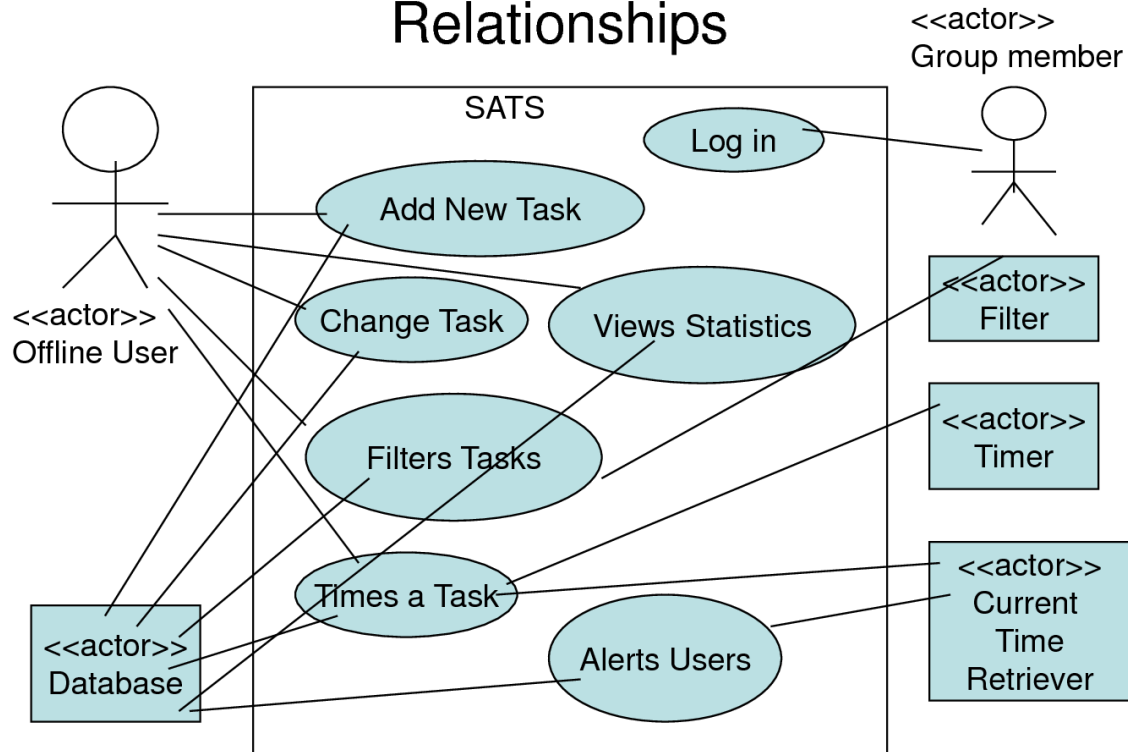


UML state machine



Use Case Diagram

Use Case Diagram Illustrating Actors and Relationships



Next

Image source

- <http://us.123rf.com/400wm/400/400/lello4d/lello4d1201/lello4d120100017/11779733-earth-globe-realistic-3-d-rendering-arctic-view-north-pole--on-white-background.jpg>
- <http://wowshopper.com/world-globe/pics-inventory/12532globe4kids-e.gif>
- http://1.bp.blogspot.com/-z1xUGqUzBPI/UJ883qBdBgl/AAAAAAAABR4/TEUi1S-S_j0/s1600/world-political-map.jpg
- http://s1.cdn.autoevolution.com/images/news/gallery/2013-chevrolet-ss-nascar-race-car-revealed-previews-rwd-sedan-photo-gallery_9.jpg
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- <http://image.clipdealer.com/329629/previews/24--329629-DNA%20strand.jpg>
- http://www.stemcellsinc.com/images/charts/cell_cartoon.jpg

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