

# UML

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# Index

- What is it and why is it so important?
- Some history
- Uses
- Structural Diagrams
- Behavioral Diagrams
- UML Tools
- Bibliography

What is it and why is it so  
important?

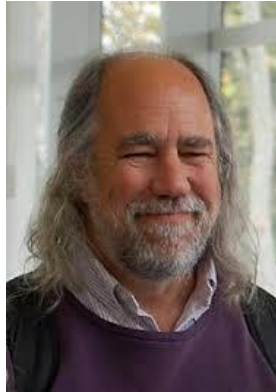
A dark blue diagonal gradient bar that starts from the bottom left corner and extends towards the top right corner, covering the lower half of the slide.

# Some history

-Rumbaugh

-Booch

-Jacobson



# Uses

- Visualize
- Specify
- Build
- Document

# UML Diagrams types

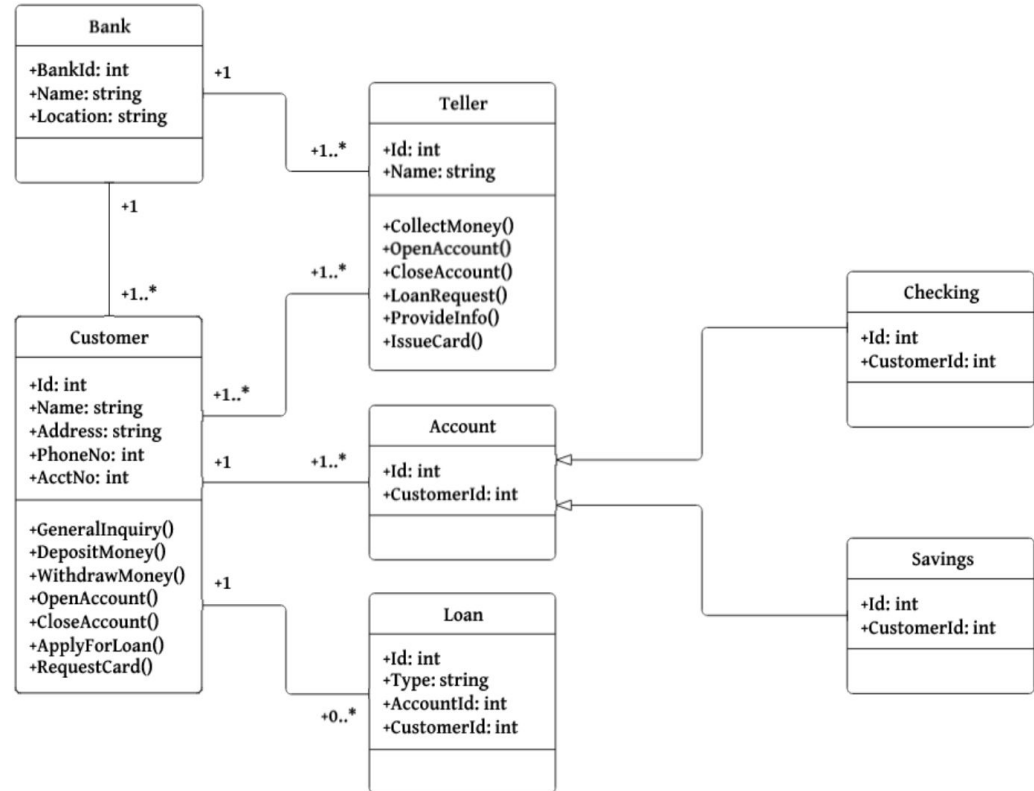
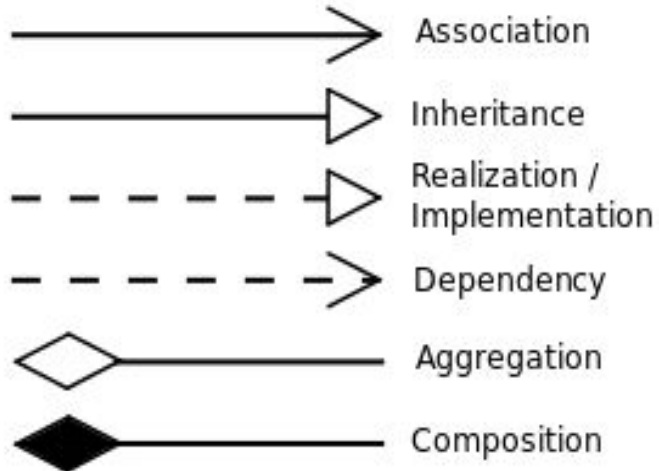
A dark blue, abstract, curved shape that starts from the bottom left and extends diagonally upwards towards the right, filling the lower half of the slide.

# 1. Structural diagrams

A dark blue, abstract, curved shape that starts from the bottom left and extends diagonally upwards towards the right, filling the lower half of the slide.

# Class Diagram

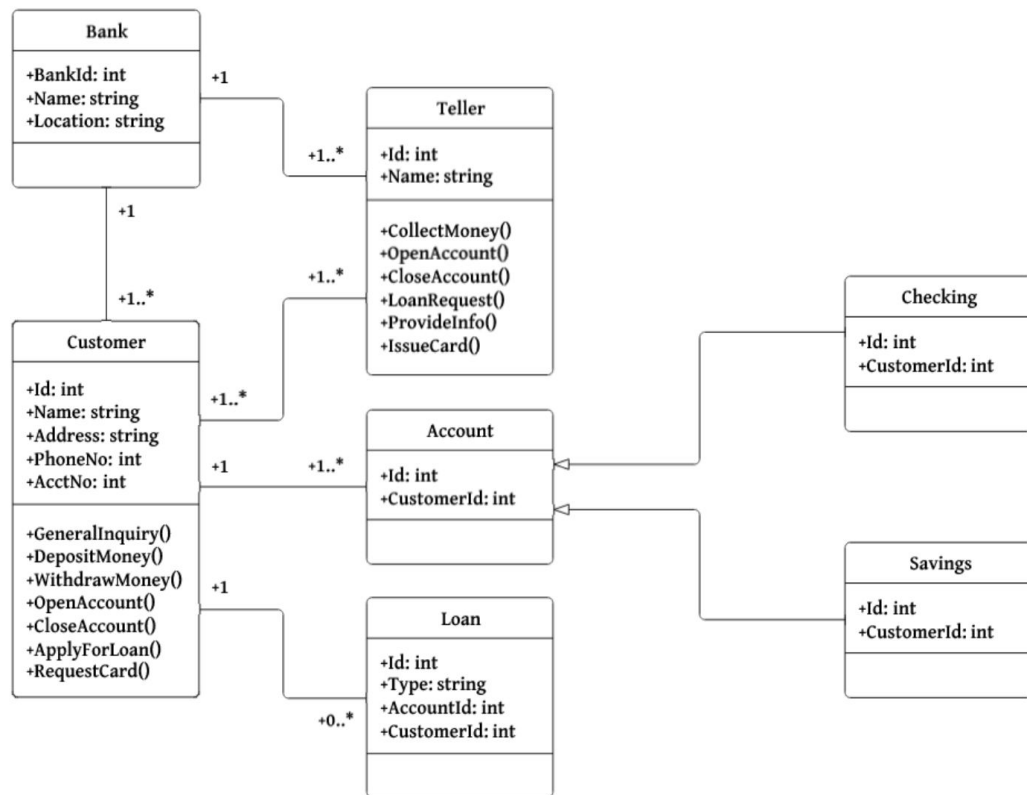
- + Public
- Private
- # Protected
- ~ Package





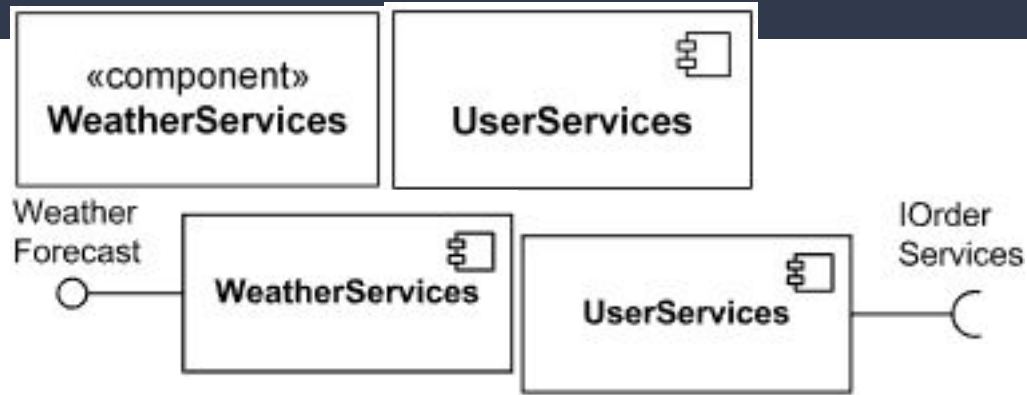
# Multiplicity

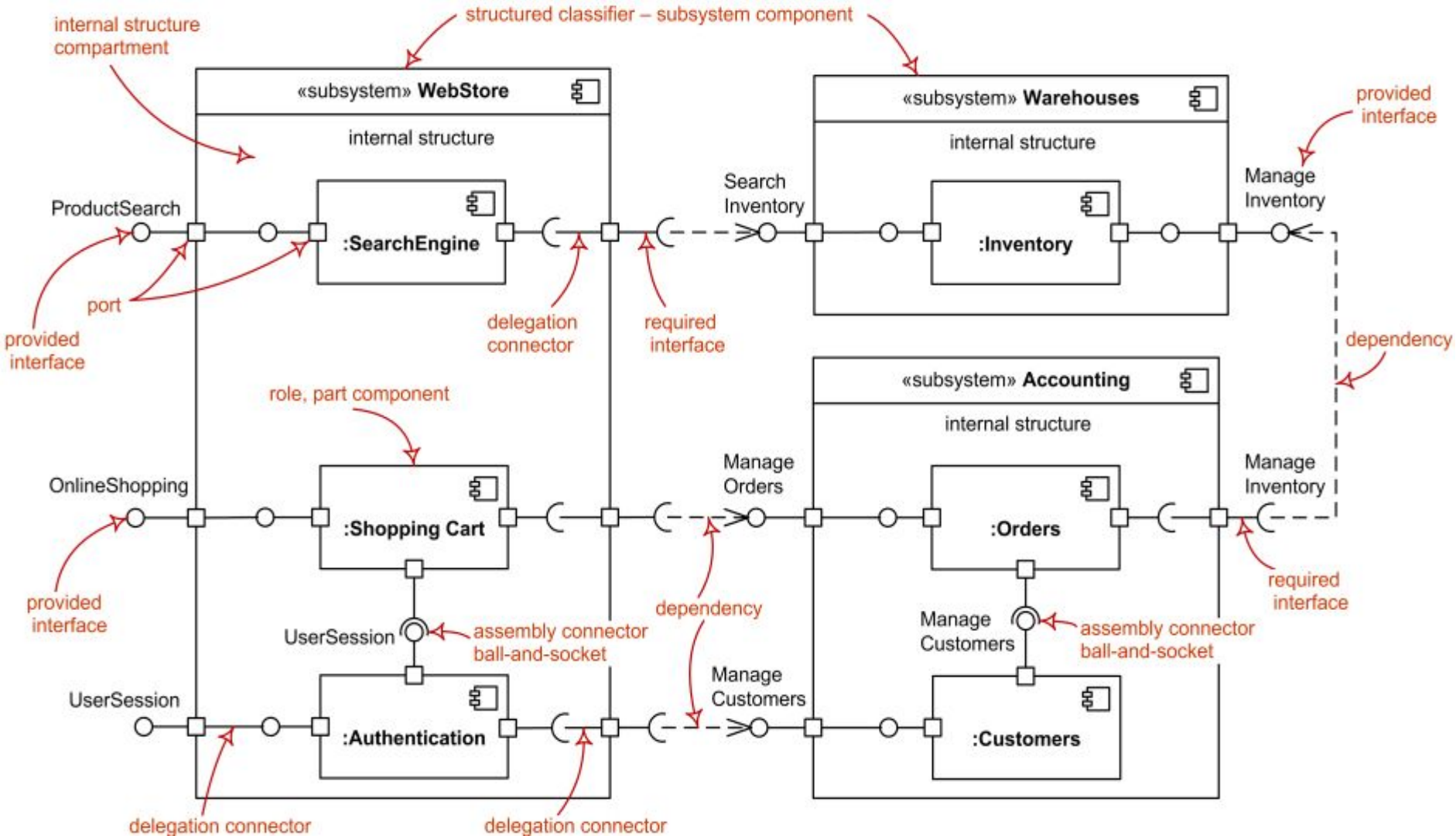
<b>0</b>	No instances (rare)
<b>0..1</b>	No instances, or one instance
<b>1</b>	Exactly one instance
<b>1..1</b>	Exactly one instance
<b>0..*</b>	Zero or more instances
<b>*</b>	Zero or more instances
<b>1..*</b>	One or more instances



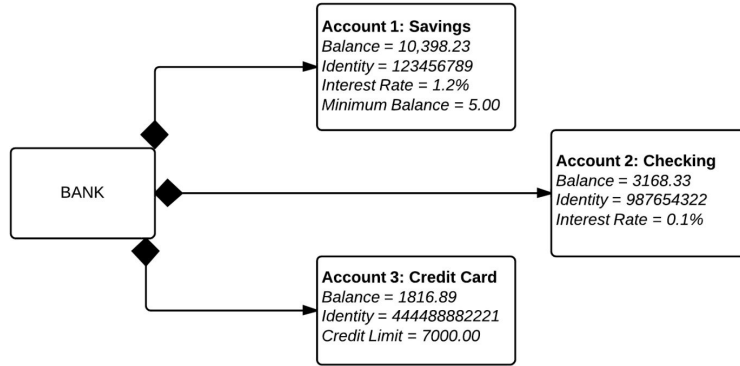
# Component Diagram

- Component
- Port
- Interface
- Provided interface
- Required interface
- Connector
- Dependency

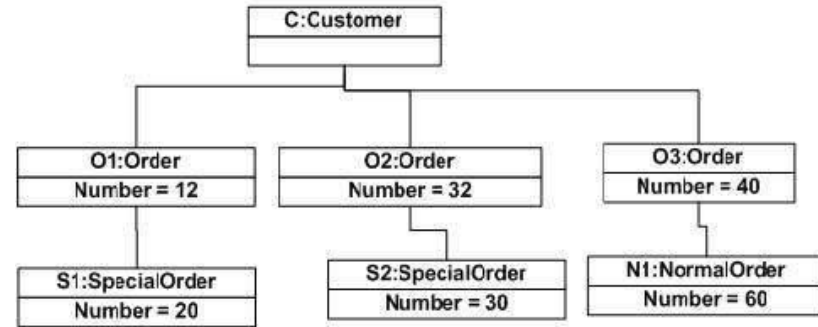




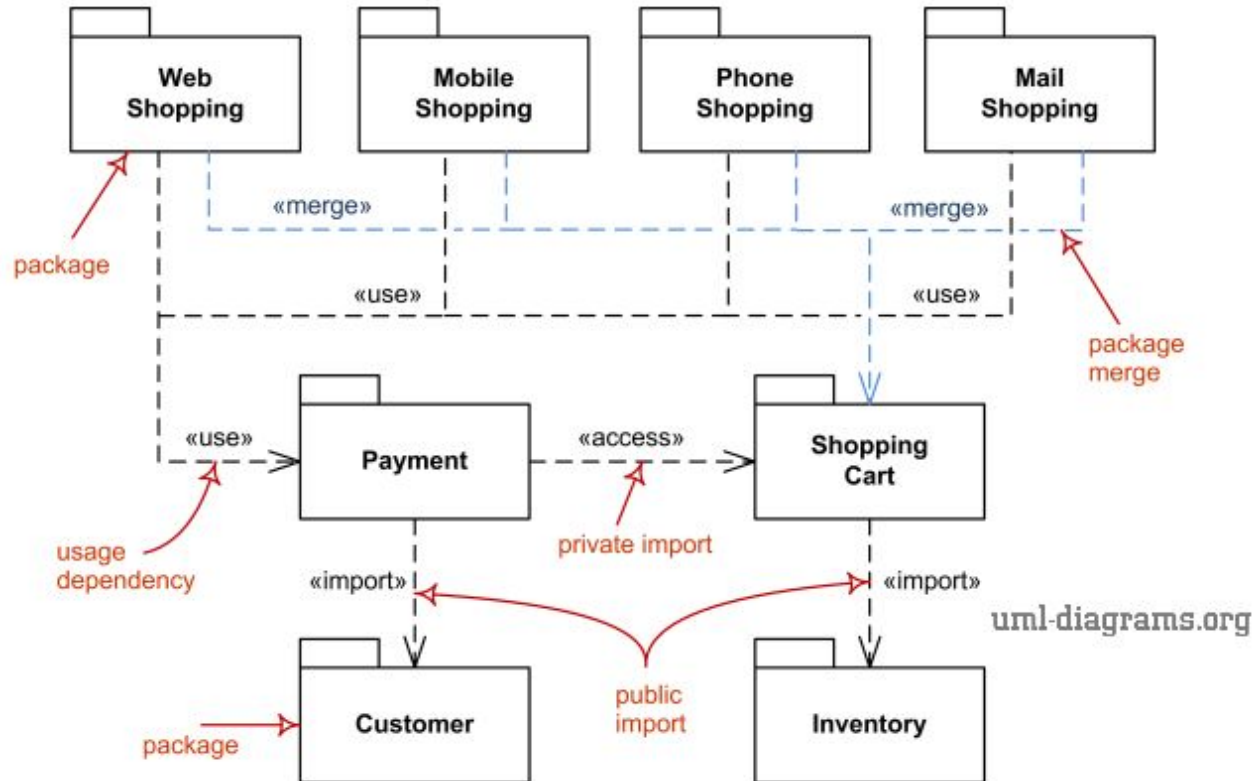
# Object Diagram



Object diagram of an order management system



# Package Diagram



# Profile Diagrams

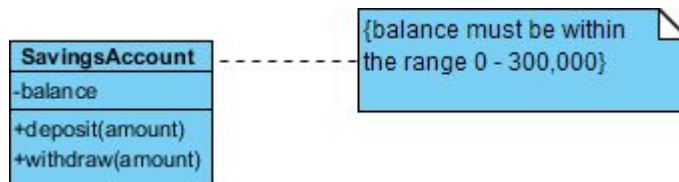
- Stereotypes



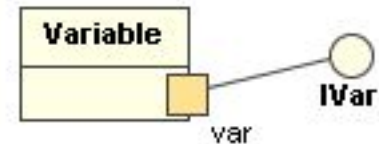
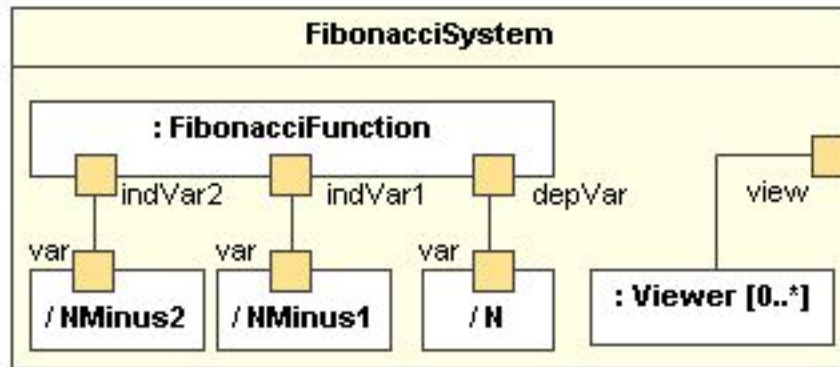
- Tagged Values



- Constraints



# Composite structure Diagram



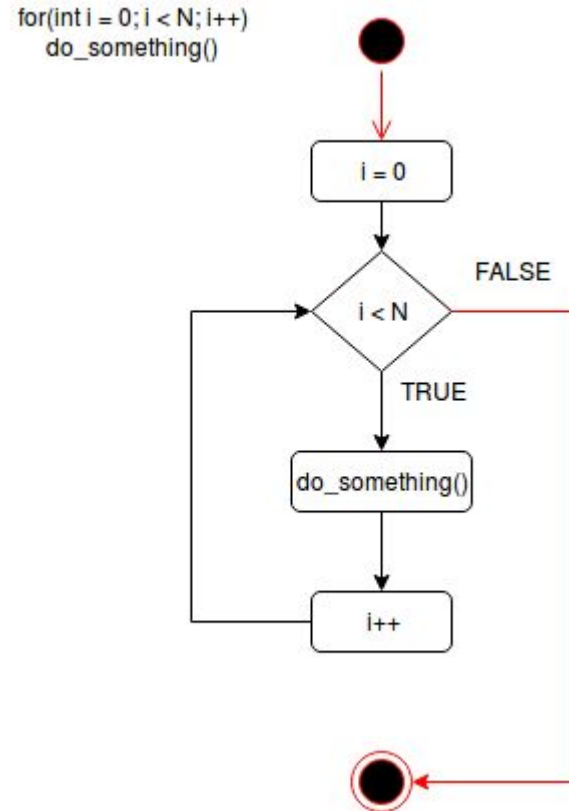
## 2. Behavioral diagrams

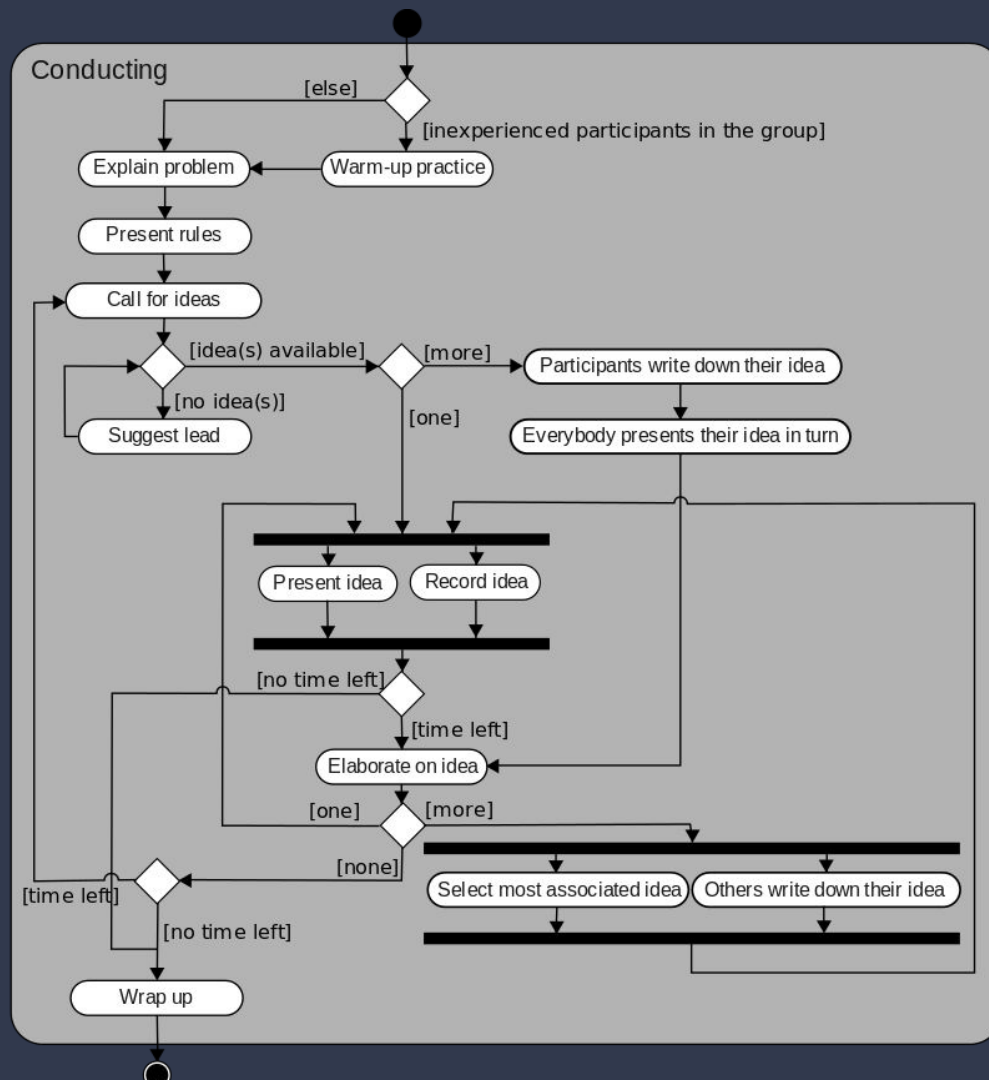
A large, dark blue, abstract shape that starts as a thin line on the left and expands into a wide, solid triangular area at the bottom right of the slide.



# Activity Diagram

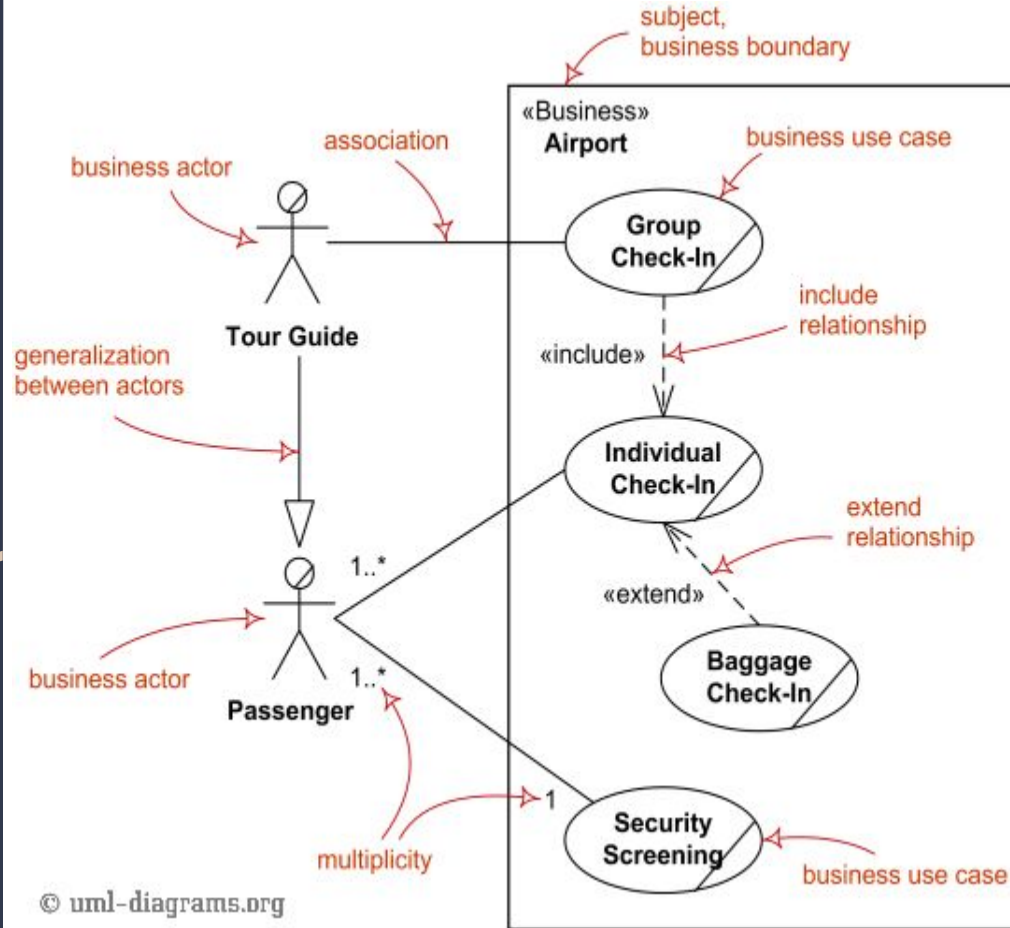
- Actions (round rectangle or ellipses)
- Decision nodes (diamonds)
- Start (black circle)
- End (encircled black)
- Concurrent activities (bars)





# Use Case Diagram

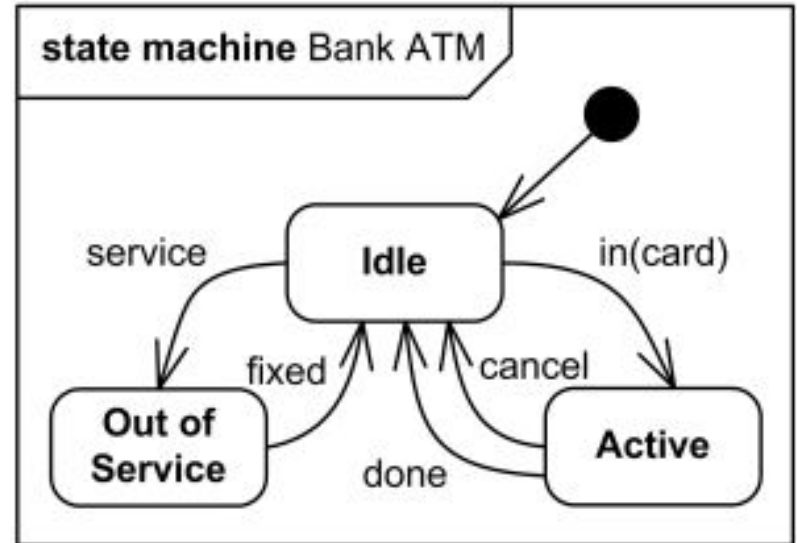
- Actors
- Use cases (circles)
- System (square)
- Relations:
  - association (simple lines)
  - include
  - extends
  - generalization (white arrow)

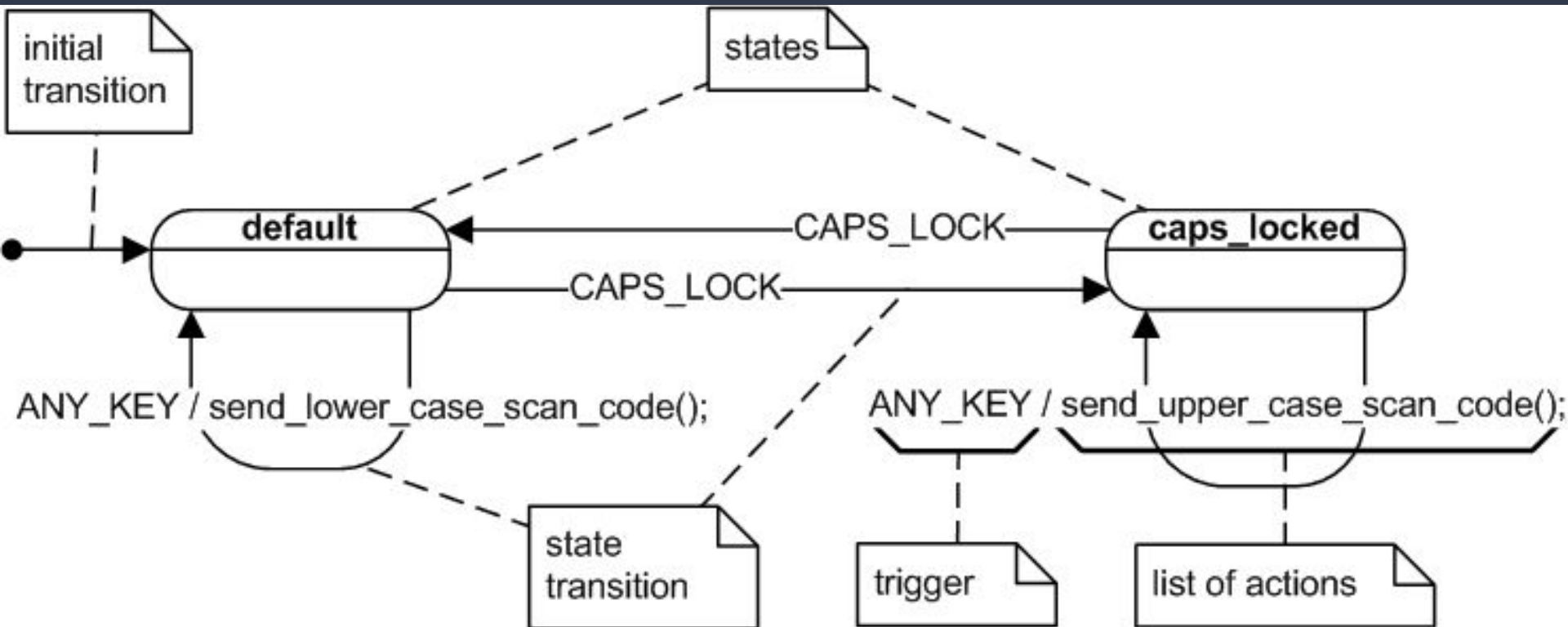


# State Machine Diagram

Concept of a finite automaton

- Start (and end, or not)
- States (round squares)
- Events (arrows)





## 2.1 Interaction Diagrams

A dark blue, abstract, curved shape that starts from the bottom left and extends diagonally upwards towards the right, filling the bottom half of the slide.

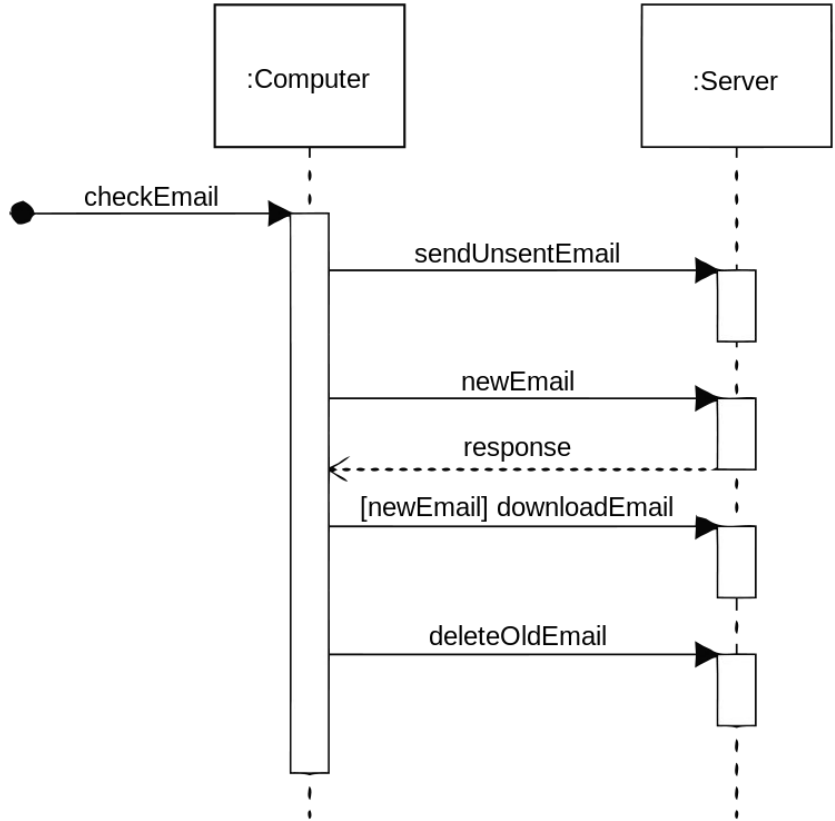
# Sequence Diagram

Time grows horizontally

- Objects (squares)
- Lifeline

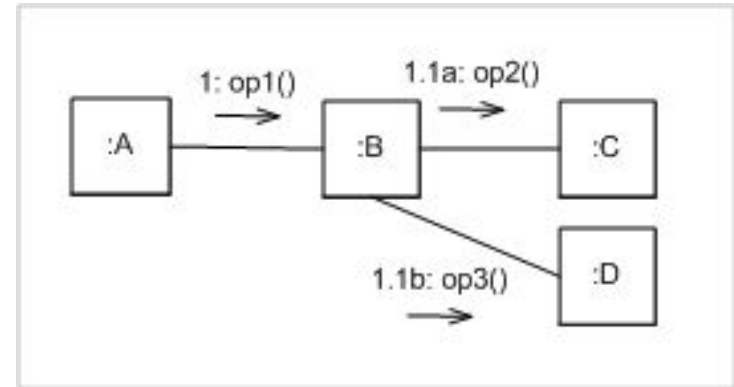
Messages types:

- Synchronous calls (solid arrow heads)
- Asynchronous calls (open arrow heads)
- Answers, returns (dashed lines)



# Communication Diagram

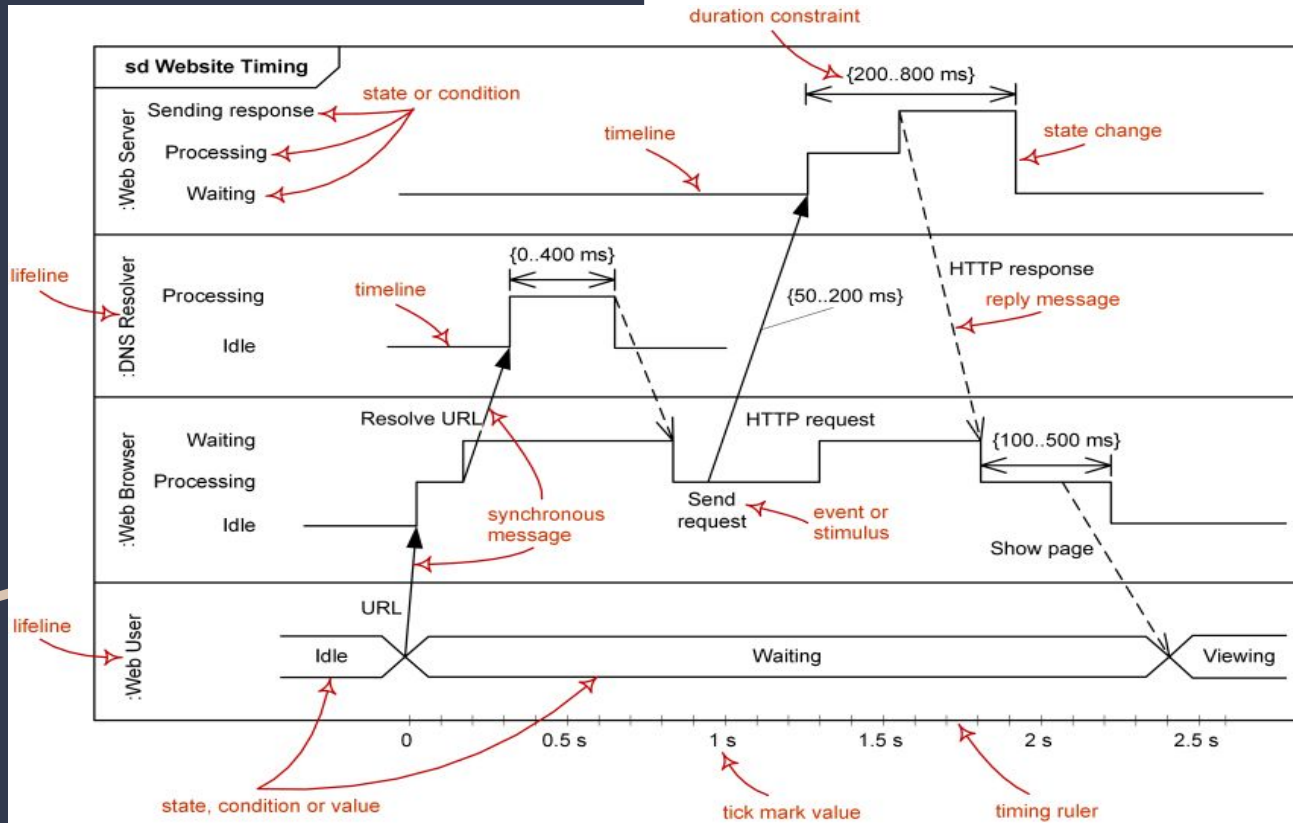
- Similar to sequence diagrams
- Series of objects arranged in time
- Calls to numbered methods





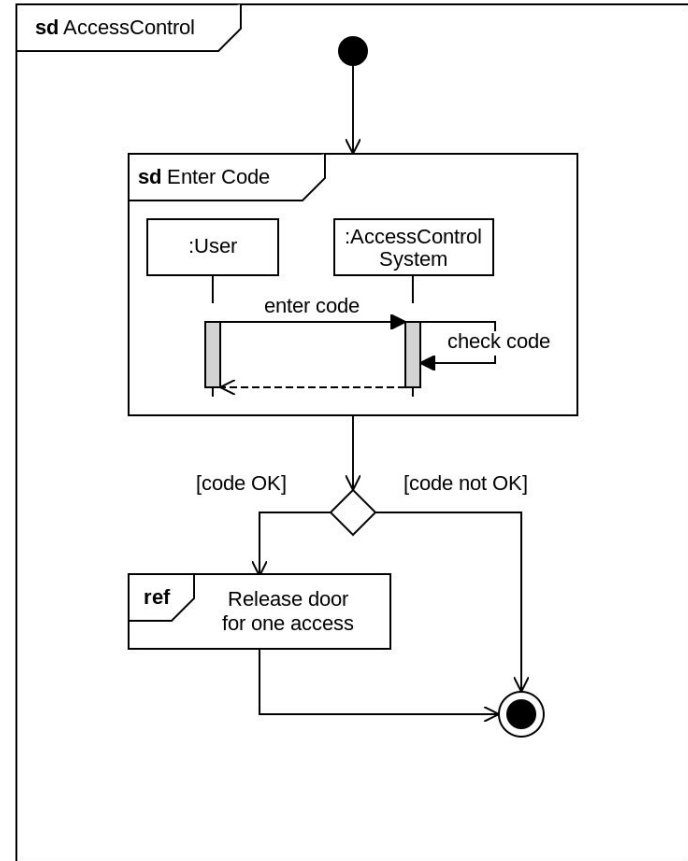
# Timing diagram

- “Real” time study
- High performance



# Interaction overview diagram

- Similar to activity diagrams
- Same elements except...
- Others interaction diagrams instead of actions



# .Tools

The screenshot displays the Microsoft Visio application window titled "Drawing1 - Microsoft Visio". The interface includes a standard Windows menu bar (File, Home, Insert, Design, Review, View, Format) and a ribbon with various tool tabs. The main workspace is divided into several panes:

- Left Pane:** Contains a "Search Shapes" box, a "Scratchpad", and a "General" section with a library of shapes (rectangles, ovals, diamonds, etc.).
- Top Pane:** Displays the "File Edit Diagram Code Settings Help" menu and a toolbar with icons for New, Open, Save, Print, Print Preview, Cut, Copy, Paste, and Find.
- Stereotypes Table:** A table with two columns: "Name" and "Usage".

Name	Usage
folder	1
datatype	11
- Tree View:** A hierarchical view showing "Datatypes" and "Use Case View". Under "Use Case View", there are two items: "new\_actor" and "new\_act...".
- Class Name:** A section with a list of class names: "umlwidgets", "umbrello", and "cppparser".
- Documentation:** A section with a checkbox for "use case diagram".
- Diagram Area:** The main workspace showing two UML diagrams. The left diagram is a "class diagram" with two actors, "new\_actor\_1" and "new\_actor", connected by a red arrow. The right diagram is a "use case diagram" with two actors, "new\_actor\_1" and "new\_actor", connected by a red arrow.
- Right Pane:** A "Bird's eye view" of the diagram, showing a zoomed-out perspective of the entire drawing.

The status bar at the bottom indicates "Ready." and shows a zoom level of "77%" with a "Fit" button and a "100%" zoom level.

# .Tools

- draw.io (open source)
- Umbrello (GPL)
- Microsoft Visio (Commercial)
- Some IDEs:
  - Eclipse
  - Microsoft Visual Studio

# Bibliography

- UML

<http://www.uml.org/>

- Tools list

[https://en.wikipedia.org/wiki/List\\_of\\_Unified\\_Modeling\\_Language\\_tools](https://en.wikipedia.org/wiki/List_of_Unified_Modeling_Language_tools)

- EcuRed

[https://www.ecured.cu/UML#Estandarizaci.C3.B3n\\_de\\_UML](https://www.ecured.cu/UML#Estandarizaci.C3.B3n_de_UML)

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