

UML AND CLASS DIAGRAMS

Advanced Programming

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Outline

1 Unified Modeling Language (UML)

2 UML Diagrams

3 UML Class Diagrams



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Basics of UML



Figure: Prompt: Draw a software architect drawing some software designs.



- The **Unified Modeling Language (UML)** is a **general-purpose, developmental, modeling language** in the field of **software engineering**, that is intended to provide a **standard way** to visualize the **design** of a system.
- The **UML** represents a **collection of best engineering practices** that have proven successful in the modeling of large and complex systems.



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Importance of UML

- The **UML** is a **standard language** for **specifying, visualizing, constructing, and documenting** the artifacts of software systems.
- It is a **powerful** and **flexible** graphical language that is used to **model** systems in an object-oriented way.



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List of UML Diagrams

- UML has **14 types** of diagrams, which can be divided into two categories:
 - **Structural Diagrams:** These diagrams represent the **static** aspects of the system. Here are some examples: [Class Diagram](#), Object Diagram, Component Diagram, [Deployment Diagram](#), among others.
 - **Behavioral Diagrams:** These diagrams represent the **dynamic** aspects of the system. Here are some examples: [Activity Diagram](#), Sequence Diagram, [State Diagram](#), among others.



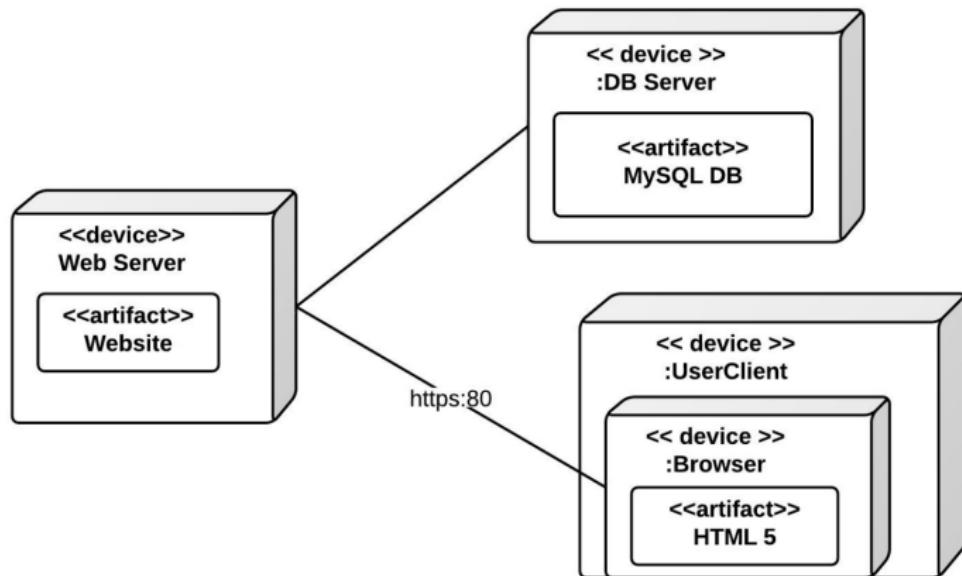
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UML Deployment Diagrams I

Deployment diagrams are used to visualize the **physical hardware** and **software** expected to be used in real-world execution of a system.

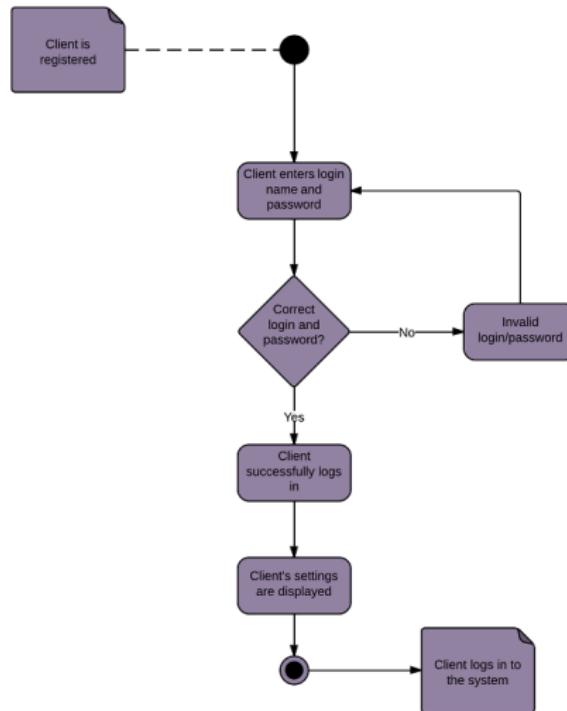


UML Deployment Diagrams II



UML Activity Diagrams I

Activity diagrams are used to model **workflow** and **business processes**.

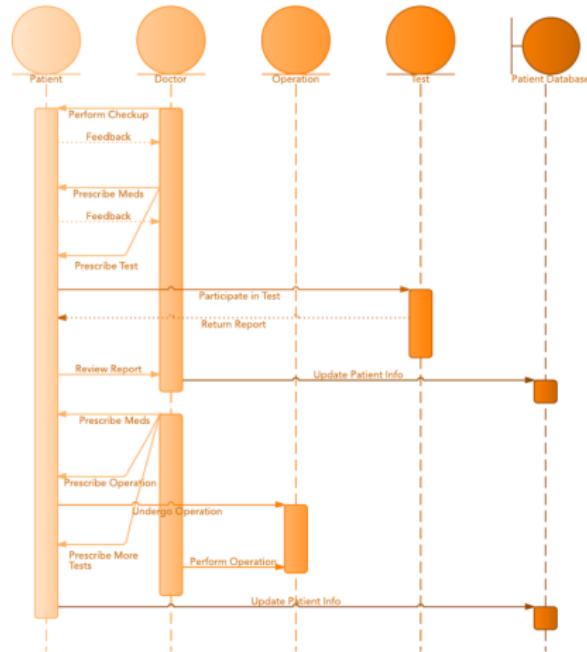


UML Activity Diagrams II



UML Sequence Diagrams I

Sequence diagrams are used to model **interactions** between **objects** in a system.

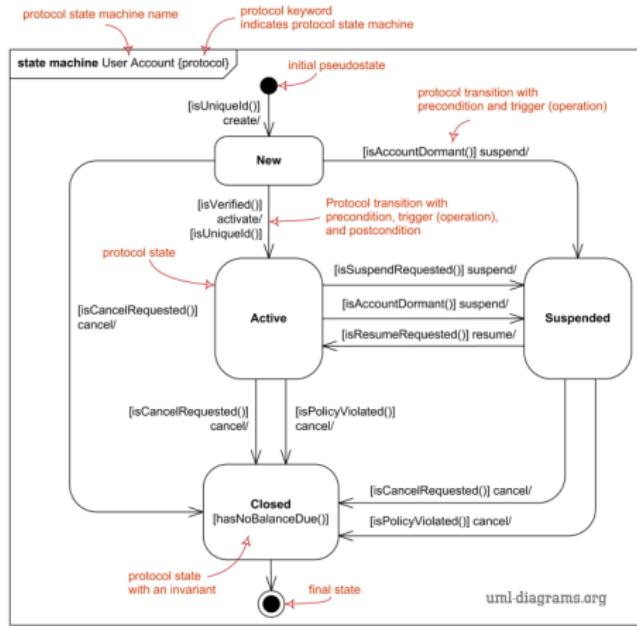


UML Sequence Diagrams II



UML State Diagrams I

State diagrams are used to model the **dynamic behavior** of an object in a system.

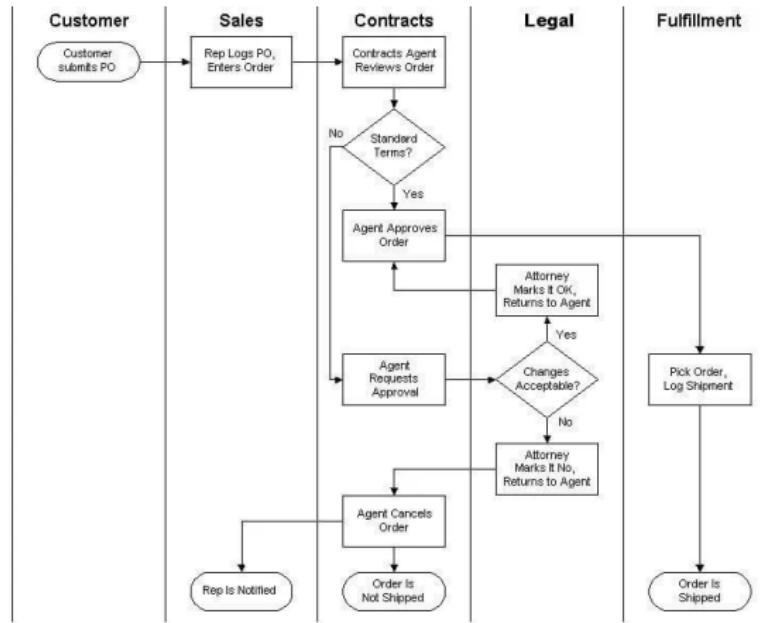


UML State Diagrams II



Business Process Diagrams I

Business process diagrams are used to model the **workflow** and **business processes** of an **organization**.



Business Process Diagrams II



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Basic Concepts of UML Class Diagrams

- A **class diagram** is a type of **static structure diagram** that describes the structure of a system by showing the system's **classes**, their **attributes**, **operations**, and the **relationships** among the classes.
- A **class diagram** is a collection of **classes** and **interfaces** that are used to model the objects in a system.



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Types of Objects Relations

- Association: A **relationship** between two classes that is used to represent a **connection** between the classes.
- Aggregation: A **relationship** between two classes that is used to represent a **part-whole** relationship between the classes.
- Composition: A **relationship** between two classes that is used to represent a **stronger part-whole** relationship between the classes.



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Good practices in UML Class Diagrams

- Use **singular nouns** for **class names**.
- Use **Camel Case** for **class names**.
- Use **singular nouns** for **attributes**.
- Use **some case** for **attributes**.
- Use **verbs** for **operations as methods**.
- Use **some casee** for **operations**.



Class Diagram Example



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Thanks!

Questions?



Repo:

 github.com/engandres/ud-public/courses/advanced-programming

