Unified Modeling Language

Parinya Ekparinya

Parinya.Ek@kmitl.ac.th

Software Architecture and Design

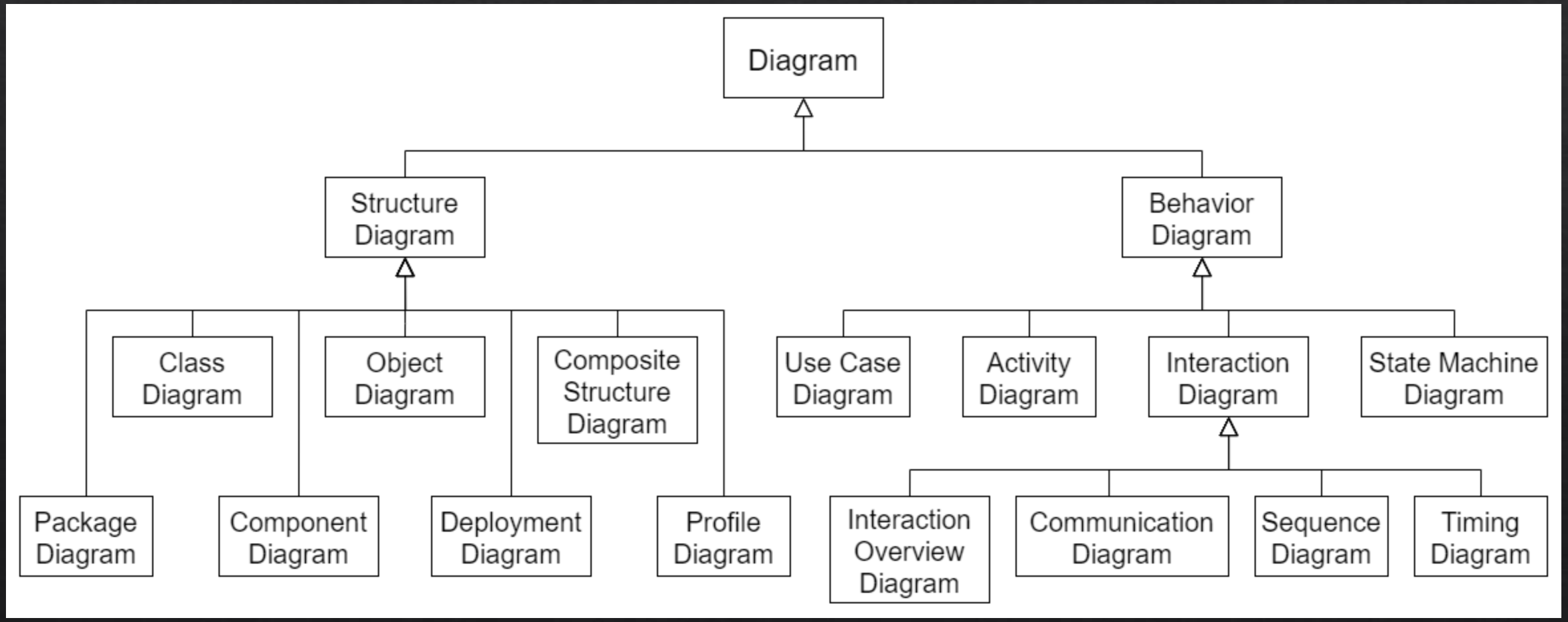
Outline

- Unified Modeling Language (UML)
- Class Diagram
- Activity Diagram
- Component Diagram
- Deployment Diagram

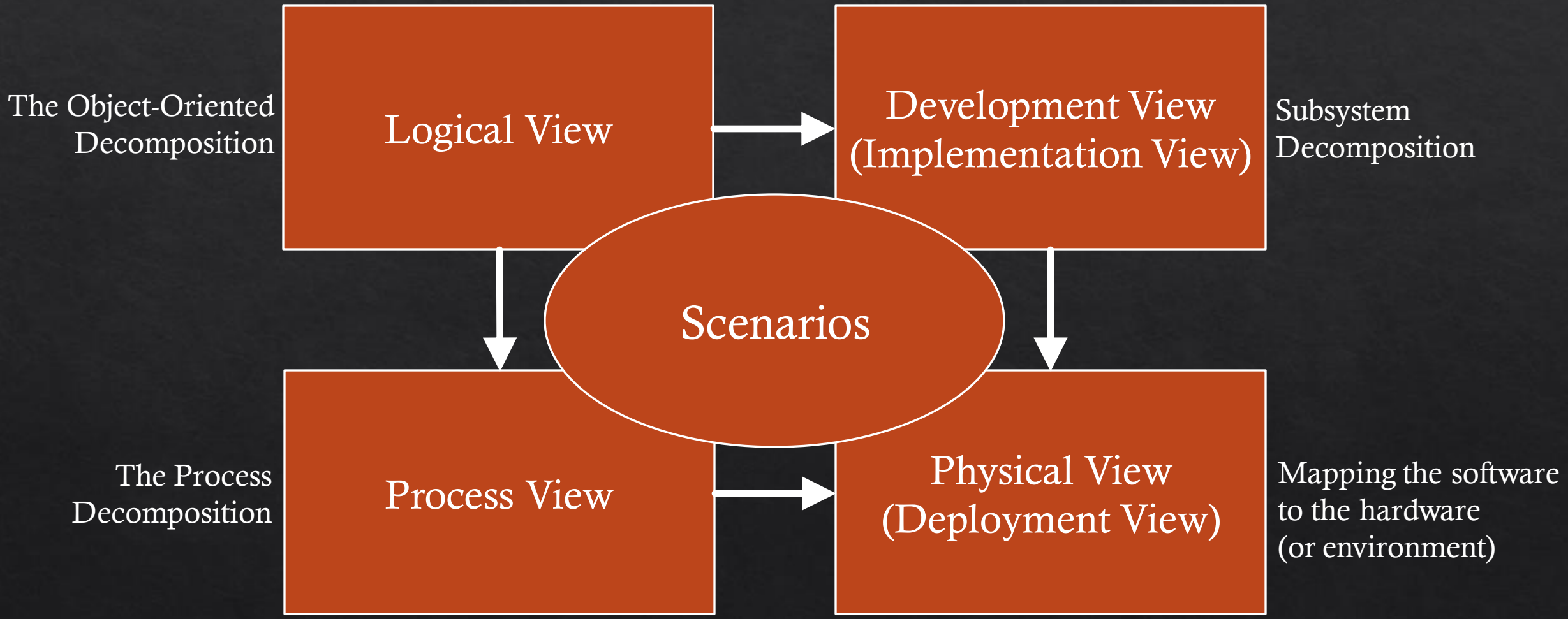
Unified Modeling Language (UML)

- The UML is a graphical language for visualizing, specifying, constructing, and documenting the artifacts of a software-intensive system.
- The UML offers a standard way to write a system's blueprints, including conceptual things such as business processes and system functions as well as concrete things such as programming language statements, database schemas, and reusable software components.
- The UML was developed at Rational Software in 1994–1995.
- The UML was also published by the ISO as an approved ISO standard in 2005.
- The latest version is 2.5, which is published in 2017.
  For specification: https://www.omg.org/spec/UML/2.5/About-UML/

UML Diagram Types



4+1 View Model of Software Architecture



Kruchten, P. B. (1995). The 4+ 1 view model of architecture. *IEEE software*, *12*(6), 42-50.

Logical View

- Logical view describes the abstract descriptions of a system's parts.
- This view is used to model what a system is made up of and how the parts interact with each other.
- The system is decomposed into a set of key abstractions in the form of objects or object classes. They exploit the principles of abstraction, encapsulation, and inheritance.
- With reference to UML, logical view typically contains class diagrams.

Process View

- Process view describes the processes within your system.
- A *process* is a grouping of tasks that form an executable unit.
- The software is partitioned into a set of independent *tasks*. A task is a separate thread of control, that can be scheduled individually on one processing node.
- Several styles would fit the process view, *pipes and filters* for example.
- With reference to UML, process view typically contains activity diagrams.

Development View

- Development view describes how your system's parts are organized into modules and components.
- Typically, this view focuses on the configuration management of a system; what components depend on what.
- The development view is also known as implementation view.
- A *layered style* would fit the process view. Each layer has a well-defined responsibility.
- With reference to UML, development view typically contains component diagrams.

Physical View

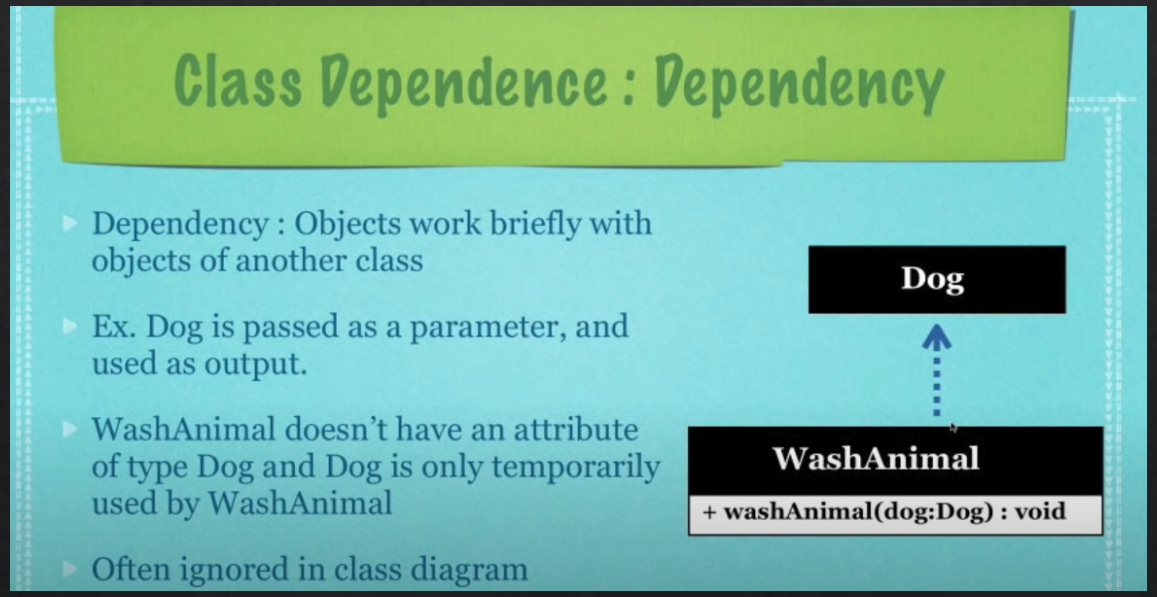
- Physical view describes how the system's components, as described in the other views, are arranged in their environments.
- The diagrams in this view show how the abstract parts map into the final deployed system.
- Thus, the physical view is also known as deployment view.
- With reference to UML, physical view typically contains deployment diagrams.

Scenarios

- Scenarios describe the functionality of the system being modeled from the perspective of its users and/or the outside world.
- The scenarios are in some sense an abstraction of the most important requirements.
- The scenarios are needed to describe what the system is supposed to do.
- This view is also known as use case view.
- This view is redundant with the other ones (hence the “+1”).
- With reference to UML, scenarios are typically expressed through use case diagrams.

Learning UML

- https://www.omg.org/spec/UML/2.5/About-UML/
- https://www.uml-diagrams.org/



ถ้ามีตัวแปรมาเก็บไว้ จะเป็นเส้นทึบ