

# UML and Design Patterns

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CMPT166

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# Quiz 6

- Describe a situation in which a **lock** is required on a shared object. What are the two (or more) entities which access the shared object, and why is a lock needed? [6]
- What do the following keywords mean in Java?
  - **synchronized, transient, protected** [9]
- This **Python** function works on **int, float, str**, etc. Outline a **Java** class/method to be just as **flexible**
  - ◆ **def double(x):**  
**return x + x**

# UML: Unified Modelling Language

- Developed at same time as OO
- Many kinds of diagrams
  - Class diagram
  - Inheritance hierarchy
  - Use-case scenarios
- Original idea from Christopher Alexander, “Notes on the Synthesis of Form”, Harvard University Press, 1964
- Ref: Gamma, Helm, Johnson, Vlissides, “Design Patterns: Elements of Reusable OO Software”

# UML class diagrams

- Name, instance variables, methods
- Modifiers:
  - +: public
  - #: protected
  - ~: package access
  - -: private

# Design patterns

- A **pattern** is a named abstraction
  - from a **recurring** concrete form
  - that expresses the **essence** of
  - a proven general **solution** technique
- A pattern has three parts:
  - some recurring **problem** from the real world
  - the **context** of the problem (when to solve it)
  - the **rule** telling us how to solve it
- Describe a **class** of problems and how to **solve**

