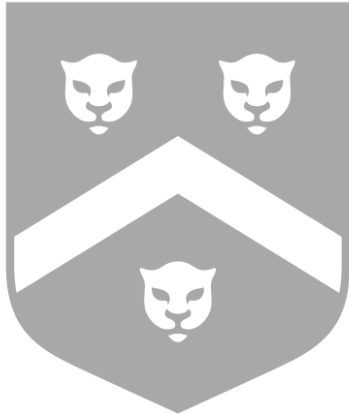


UML Diagrams



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**UML
Diagrams**

Definition

Purpose

**Class
Diagrams**

UML Diagrams



Definition

- UML is short for *Unified Modeling Language*
- UML is a language with formal rules so people can convey precise information
- The full UML specifications are in ISO 19505

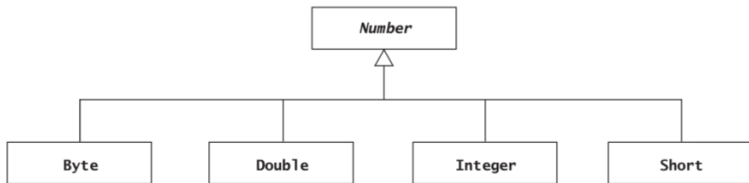
Purpose

- UML is used to model the design and architecture of an object-oriented program
- This allows software engineers to separate the design from the code
- UML diagrams give visually clear information on a program's system design – class design, package design, activity design, etc.
- UML has many types of diagrams, but we will only focus on *class diagrams*

Class Diagrams

Class Diagrams

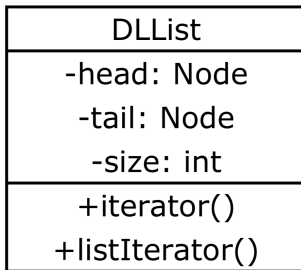
A class diagram shows a relationship tree between all classes. The `Object` class is implicitly at the root of the tree.



Class hierarchy of abstract `Number` class and extending classes

Individual Class Diagram

- A UML diagram for an individual class shows the class name and all of its attributes and operations
- In Java, this translates to data fields and methods



`DLList` class diagram with attributes and operations

Attributes

- Each attribute has three pieces of information:
 - visibility symbol
 - attribute name
 - attribute type
- Syntax is: <visibility> <name>:<type>

Symbol	Visibility
+	public
-	private
#	protected
~	package

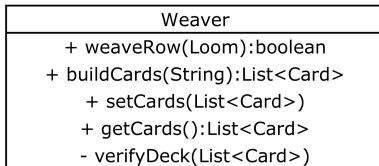
Visibility symbols

Studio
- warpColor: Color
- weaver: Weaver
- loom: Loom
- frame: TapestryFrame

Studio attributes

Operations

- Each operation has four pieces of information:
 - visibility symbol
 - operation name
 - operation parameter types, comma separated
 - operation return type (blank if **void**)
- Syntax : `<vis> <name>(param types):<return type>`



Weaver operations

Variations

UML
Diagrams

Class
Diagrams

Class Diagrams

Class Diagram

Attributes

Operations

Variations

- Often times, strict UML is not used
- Simplified versions leave out type information
- Class diagrams also show relationships between classes besides class hierarchy
- Different arrows are used for this, similar to connections in a relational database