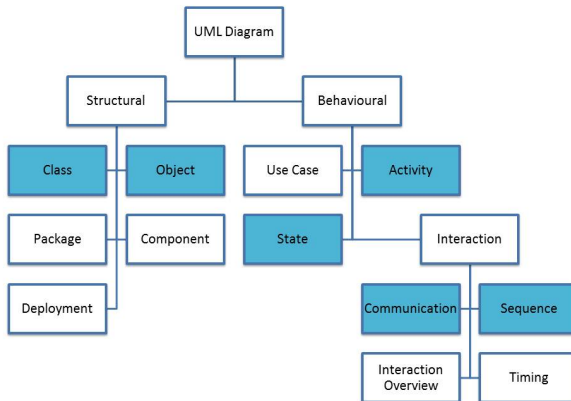# UML Diagrams

Communication diagrams

Linda Marshall

Department of Computer Science - University of Pretoria

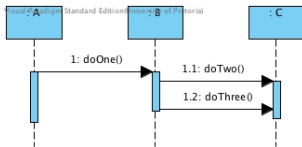## 25 October 2021

UML Diagrams

The term **interaction diagram** is a generalisation of four more specialised UML diagram types

- **sequence**
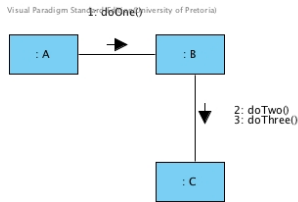- **communication**
- *interaction overview*
- *timing*

A communication diagram is used to:

- Model message passing between objects (messages appear in the form of method calls).

- Model mechanisms within the architectural design of the system.

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Similarity
Difference

Communication diagrams and sequence diagrams are very similar

Sequence diagram

Communication diagram

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Similarity
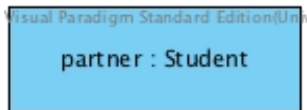Difference

Summary of their differences:

- **Sequence diagrams**
  - Easier to read call-flow sequence
  - More notation options allows for higher expressiveness

- **Communication diagrams**
  - Easier to observe which objects are involved in the communication

Introduction
Communication Vs Sequence diagrams
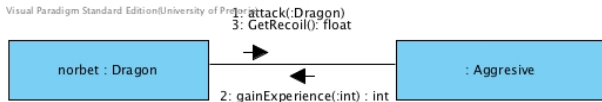Basic Notational Elements
Advanced Notational Elements
Example

Object
Link line
Message
Reflexive Message
Sequence numbers

Visual Paradigm Standard Edition(Un

partner : Student

- Name of instance :   Class name
- may be anonymous

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Object
Link line
Message
Reflexive Message
Sequence numbers

A connection path indicating that there is an association between the objects.

(Looks very much like a UML Object Diagram)

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Object
Link line
Message
Reflexive Message
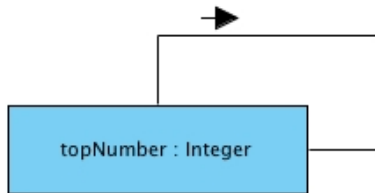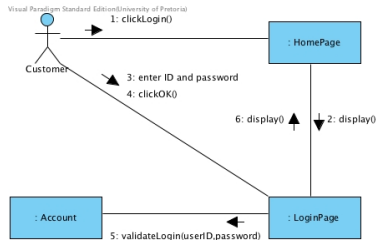Sequence numbers

- Method signature
- Arrow indicates direction
- Multiple messages in both directions flow along the same link.

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Object
Link line
Message
Reflexive Message
Sequence numbers

- Message to self

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Object
Link line
Message
Reflexive Message
Sequence numbers
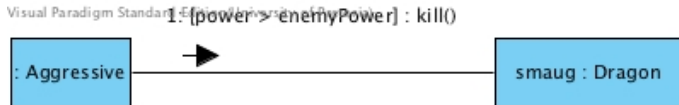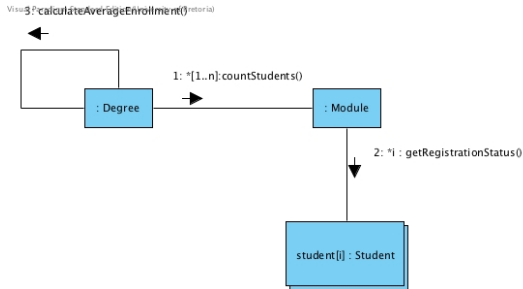
- Use numbers to show the order of the actions
- Numbering scheme is not prescribed and may include sub-numberings

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Creation and destruction
Conditional messages
Iteration

- The assumption is that communication between instantiated objects are modelled.

- Construction and destruction are not shown in Communication diagrams.

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Creation and destruction
Conditional messages
Iteration

- Use a guard to show the condition

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Creation and destruction
Conditional messages
Iteration

- guard condition / starting and ending values / counter
- Note the difference between statements in the body of a loop and nested loops

Introduction
Communication Vs Sequence diagrams
Basic Notational Elements
Advanced Notational Elements
Example

Creation and destruction
Conditional messages
Iteration

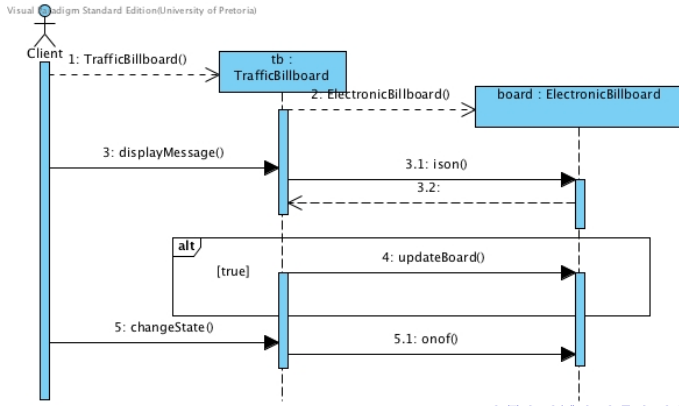## Message structure
```
SequenceNumber.
[''[''Conditional/loopIndicator``]'':]
[returnValue :=]
methodName(parameters) :
ReturnType
```

The Billboard

Draw the corresponding communication diagram.

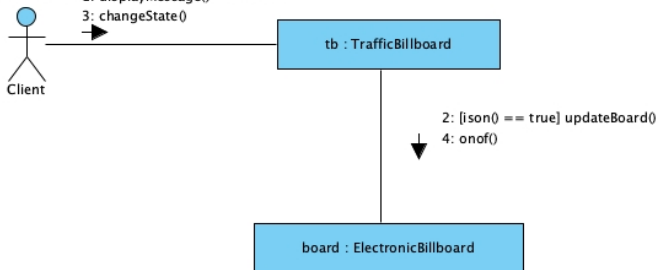Comparison of Sequence and Communication diagrams

- Present similar information.

- Sequence diagram more detailed than Communication diagram.

- Relationships between objects presented as a function of time in a Sequence diagram.

- Communication diagrams show the relationships between a particular configuration of objects.

- Message synchronicity more detailed in Sequence diagrams.

- Any thing else?