Concept of Objects

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Objectives

- Differentiate between real world objects and software objects
- Describe object concepts: attributes, state, message and behavior
- Describe how a task can be achieved by using objects
- Use UML graphical notations to describe classes and objects

What are objects?

Example:

- A desktop computer and a notebook
- Common attributes: ???

- Common behaviours: ???

Real-world objects vs. computer objects

- Object-oriented software model the real-world objects using software object.
- The real-world objects have their own characteristics (e.g., the colour of ball is red) and perform different actions (e.g., hit the red ball)
- Software object ranging from physical such as washing machine objects to abstract concepts or idea object such as bank account

Type of objects

	Type of Objects	Examples
1	Tangible things	Physical objects,
2	Roles	Role of people or organizations
3	Incidents	Something happening at a particular time
4	Interactions	Link between objects
5	Specifications	A definition of a set of other objects,

Object concepts: Attribute, state, message & behavior

Problem: to model a washing machine

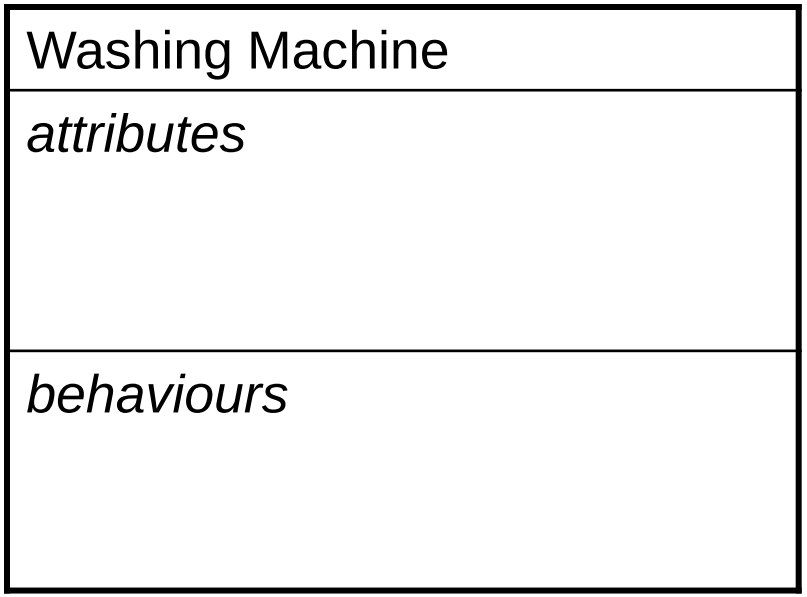
- Requirement Phase: to collect the information about a washing machine
- Analysis Phase: a washing machine is characteristics by its ??? (common attribute and behaviours)

Object concepts: Attribute, state, message & behavior

- Design Phase:

A class definition

For a washing machine

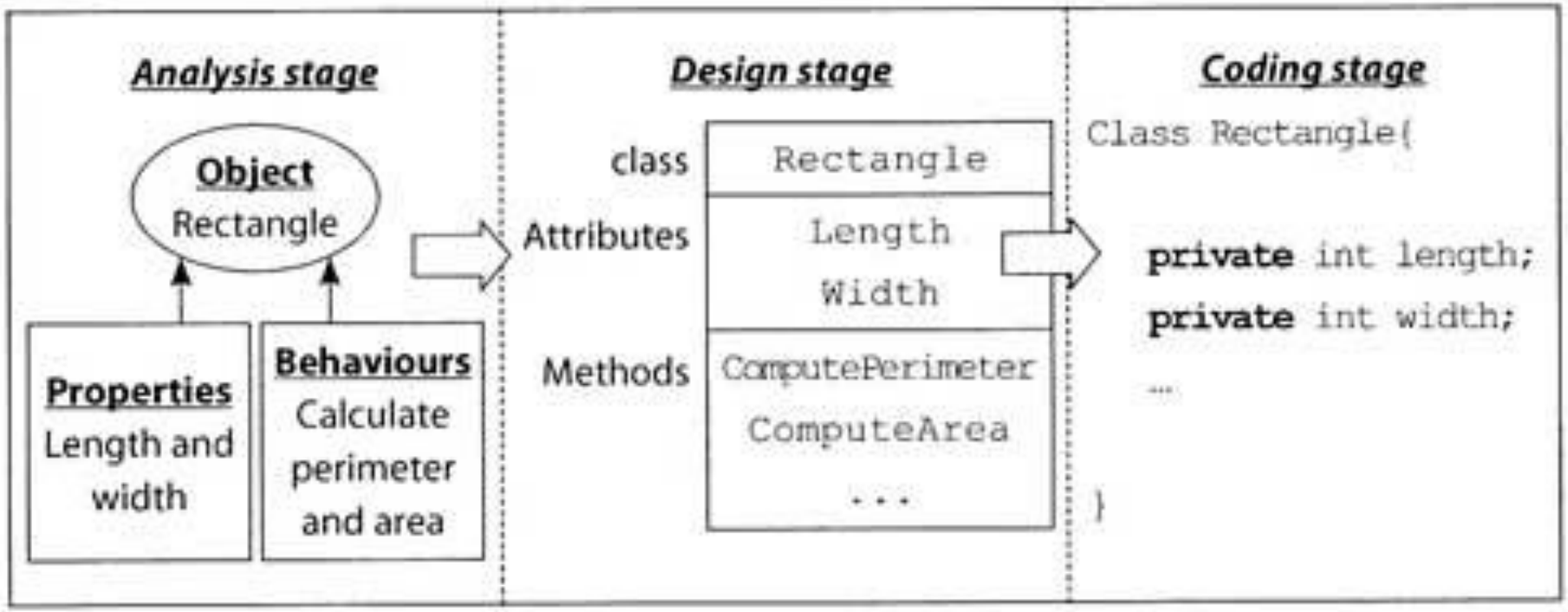


Object concepts: Attribute, state, message & behavior

The information of a Washing machine

1. *attribute: value*
2. *attribute: value*
3. *attribute: value*
4. *attribute: value*
5. *….*

A rectangle class's attributes and method correspond to the object properties and behaviours



Accomplishing tasks by object

Example: Transferring money between bank accounts

The bank system transfers an amount of money from a source account to a destination account. It first withdraws the amount from the source account and then deposits the same amount to the destination account.

Accomplishing tasks by object

- In the bank account transfer scenario, ???? objects are involved
- How these objects communicate through sending each other messages?

Question

- Create new classes for each real-world object that you observed.
- For each new class that you've created above, create an interface that defines its behavior, then require your class to implement it.