

SYS466

Analysis and Design

Lecture 3 - Object Oriented Analysis and Design / Domain Modelling
School of Information and Communications Technology
Seneca College

usually proper nouns or specific references in business documents

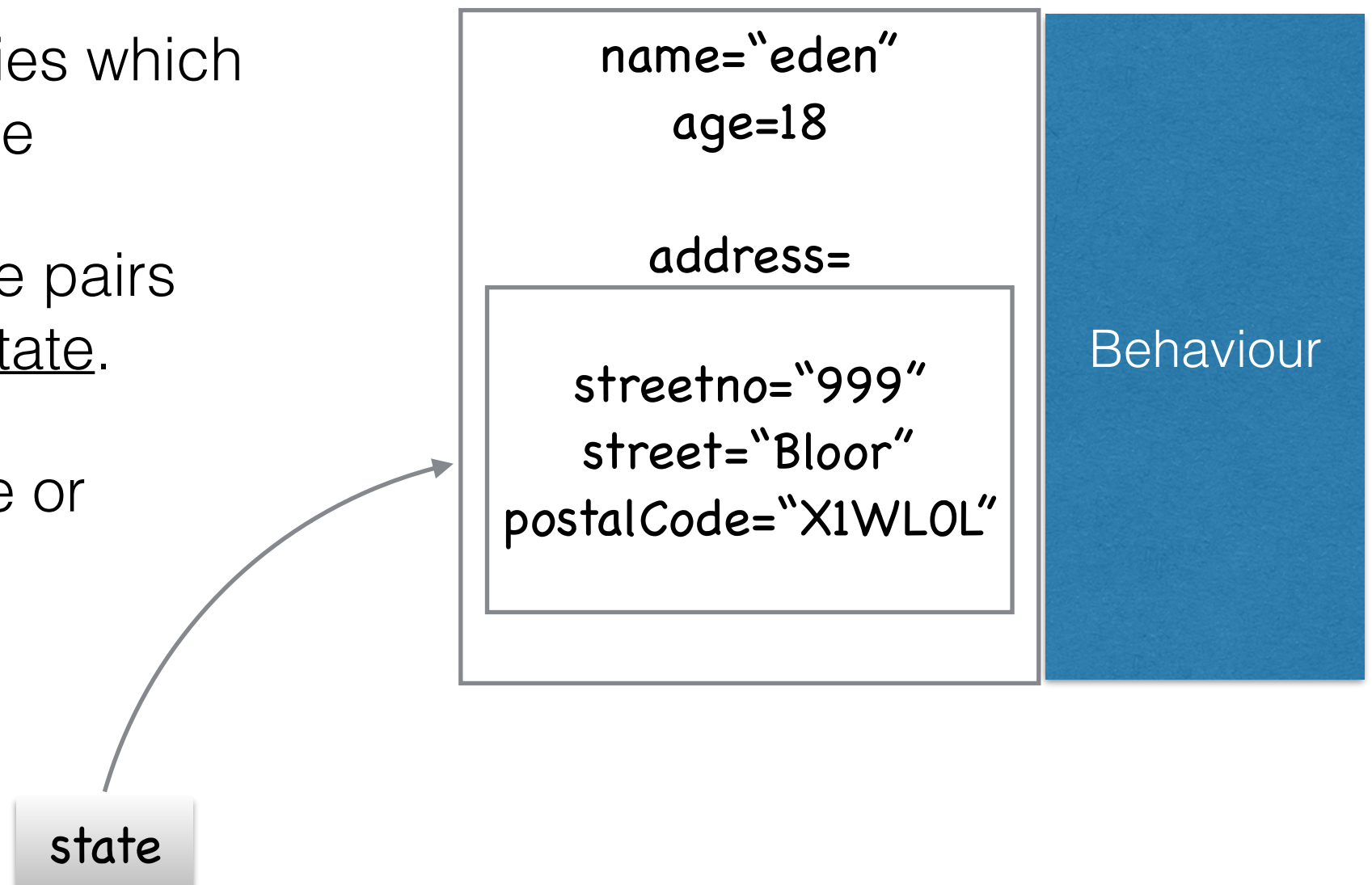


“... a concept, abstraction or thing with identity that has meaning in an application ...”

–object definition (Blaha,Rumbaugh)

Object State

- has a list of properties which are assigned a value
- set of property/value pairs define an object's state.
- value can be simple or another object



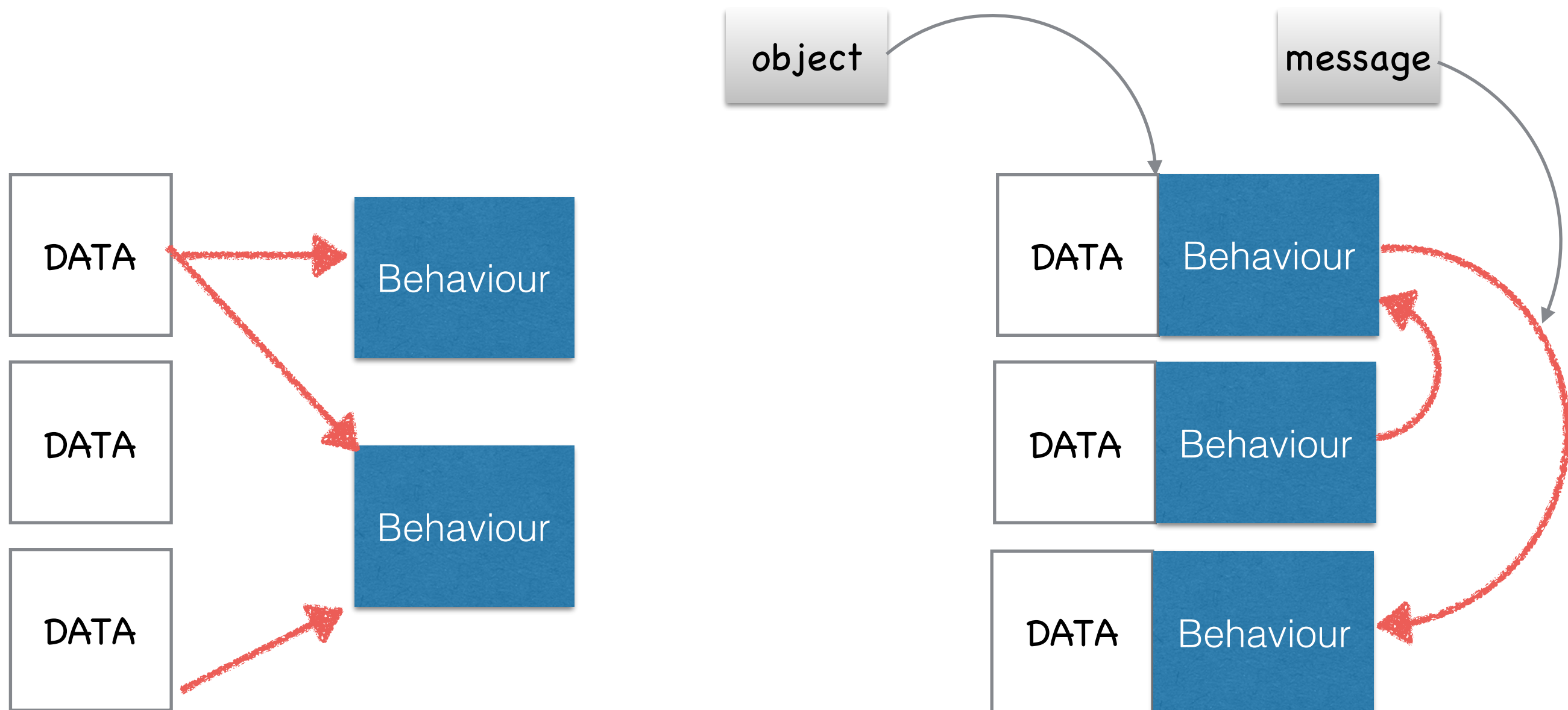
Object Behaviour

- defines an object acts
 - 📌 changing state
 - 📌 pass messages
 - 📌 reacts to messages



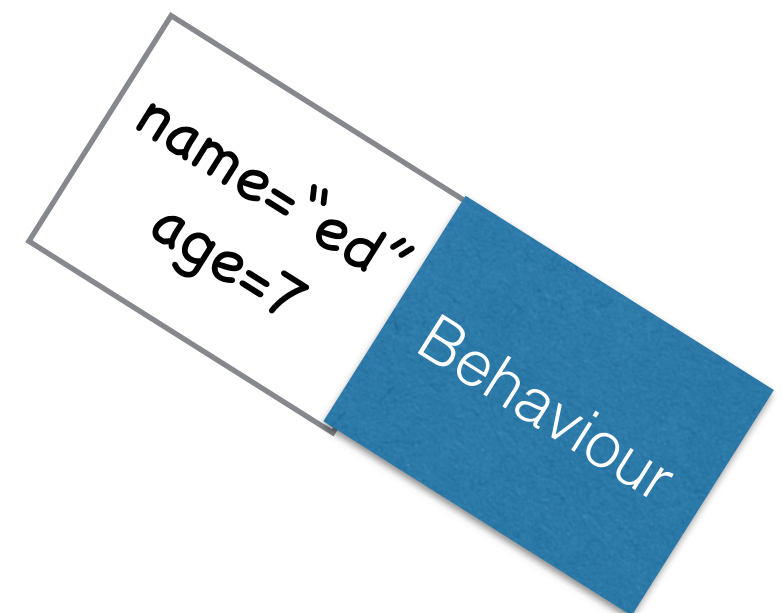
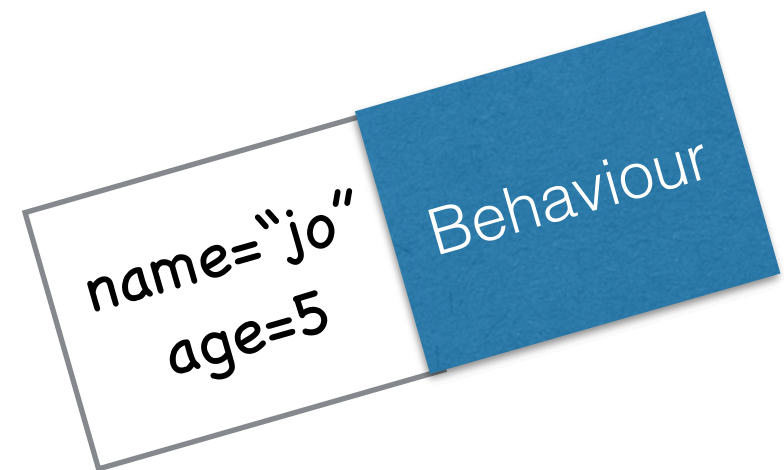
Object-Oriented Approach

- organize software into objects which have data structure and behaviour



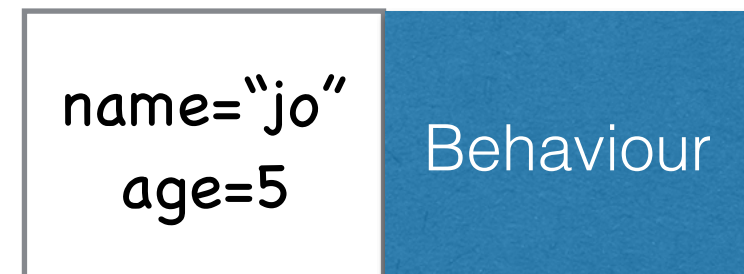
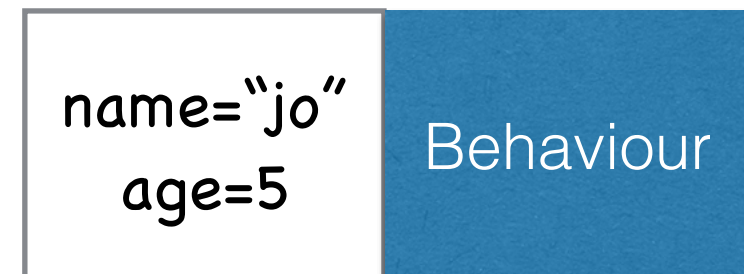
Key OO Aspects

- identity
- classification
- inheritance
- polymorphism



Identity

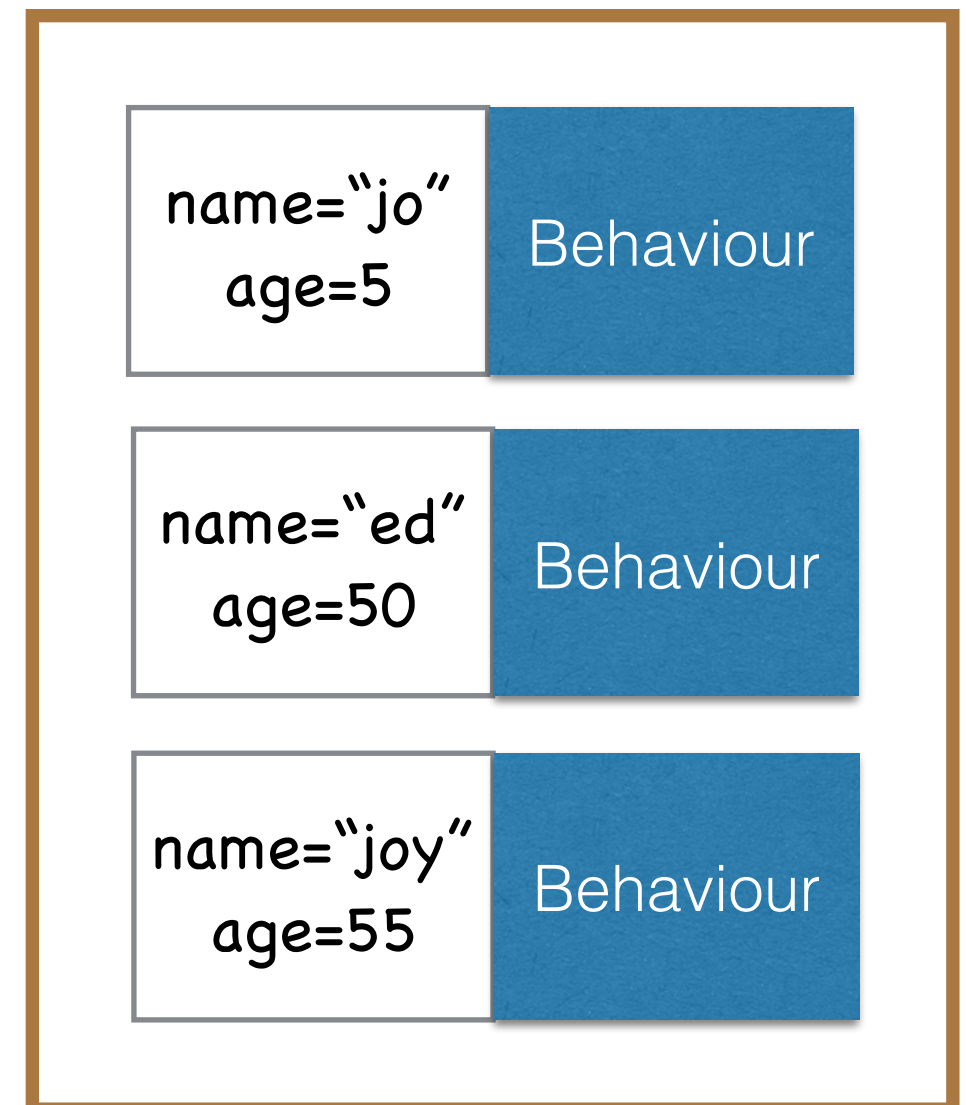
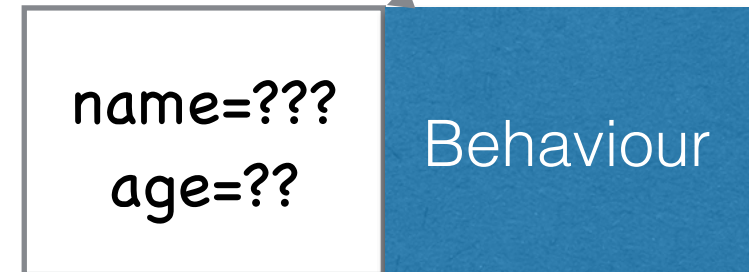
- property that distinguishes an object from all others
- can have same attributes/state and behaviour yet still be distinct





CLASS-ification

class
definition

- objects with the same data structure (attribute list) and behaviour are grouped into classes
- a class determines an object's type
- class definition serves as a blueprint for creating new objects
- object is an instance of a class



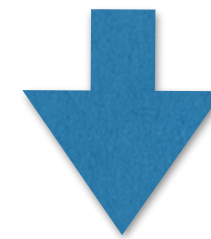
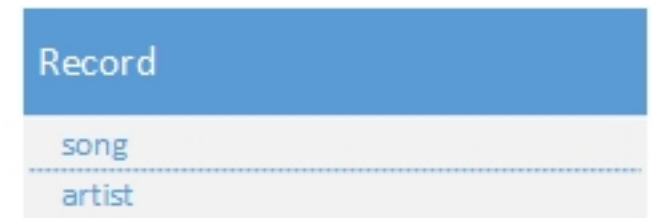
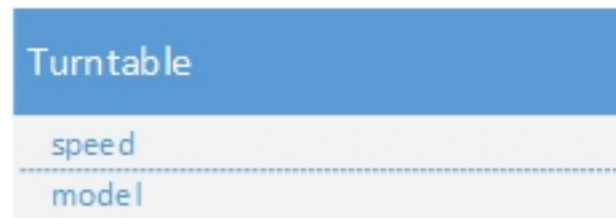
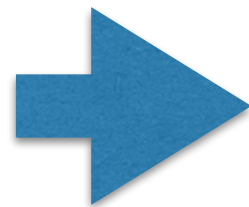
Analysis and Design Using Object-Oriented Models

- simulate the logic, structure, object interactions and architecture of a “significant” OO system.
- facilitate development of complex systems
 -  reusable classes (groups of classes)
 -  functional decomposition (iterative and incremental development)

Analysis and Design Using an Object-Oriented Methodology

- object-oriented analysis
 - 📌 emphasis on finding/describing objects in the problem domain
- object-oriented design
 - 📌 emphasis on defining software objects and how they collaborate to fulfil requirements
- object-oriented development
 - 📌 emphasis on building actual objects

Object-Oriented Methodology

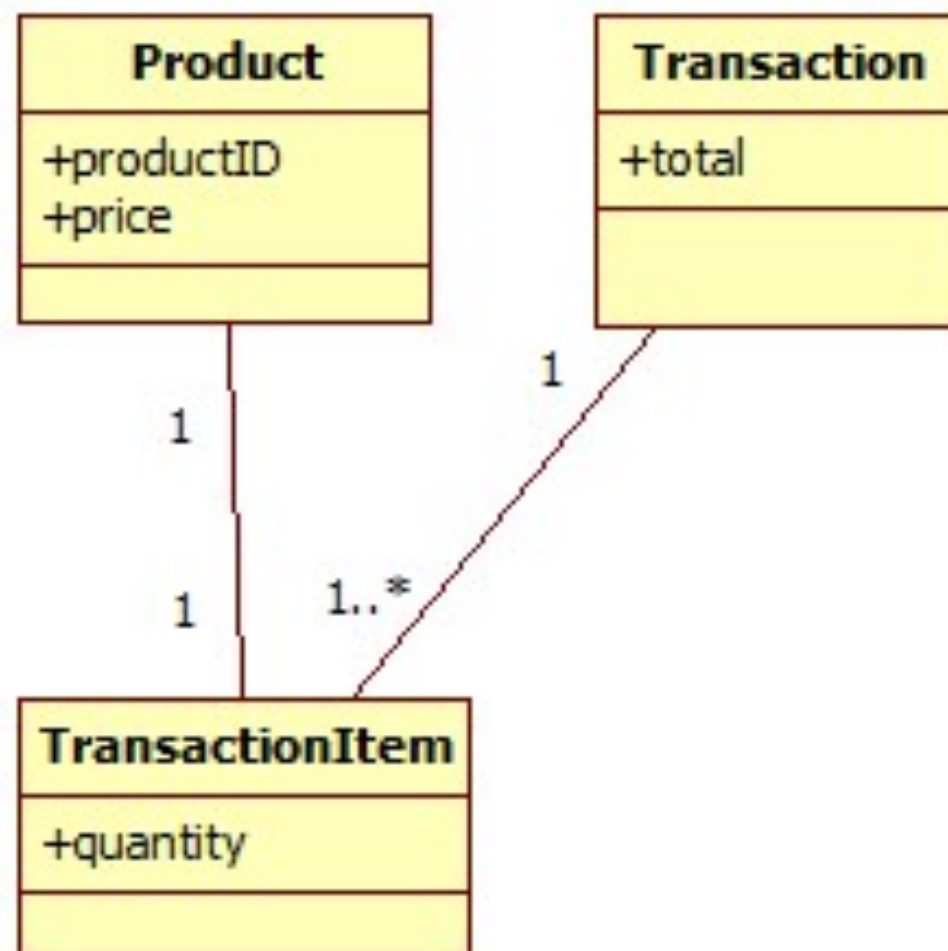


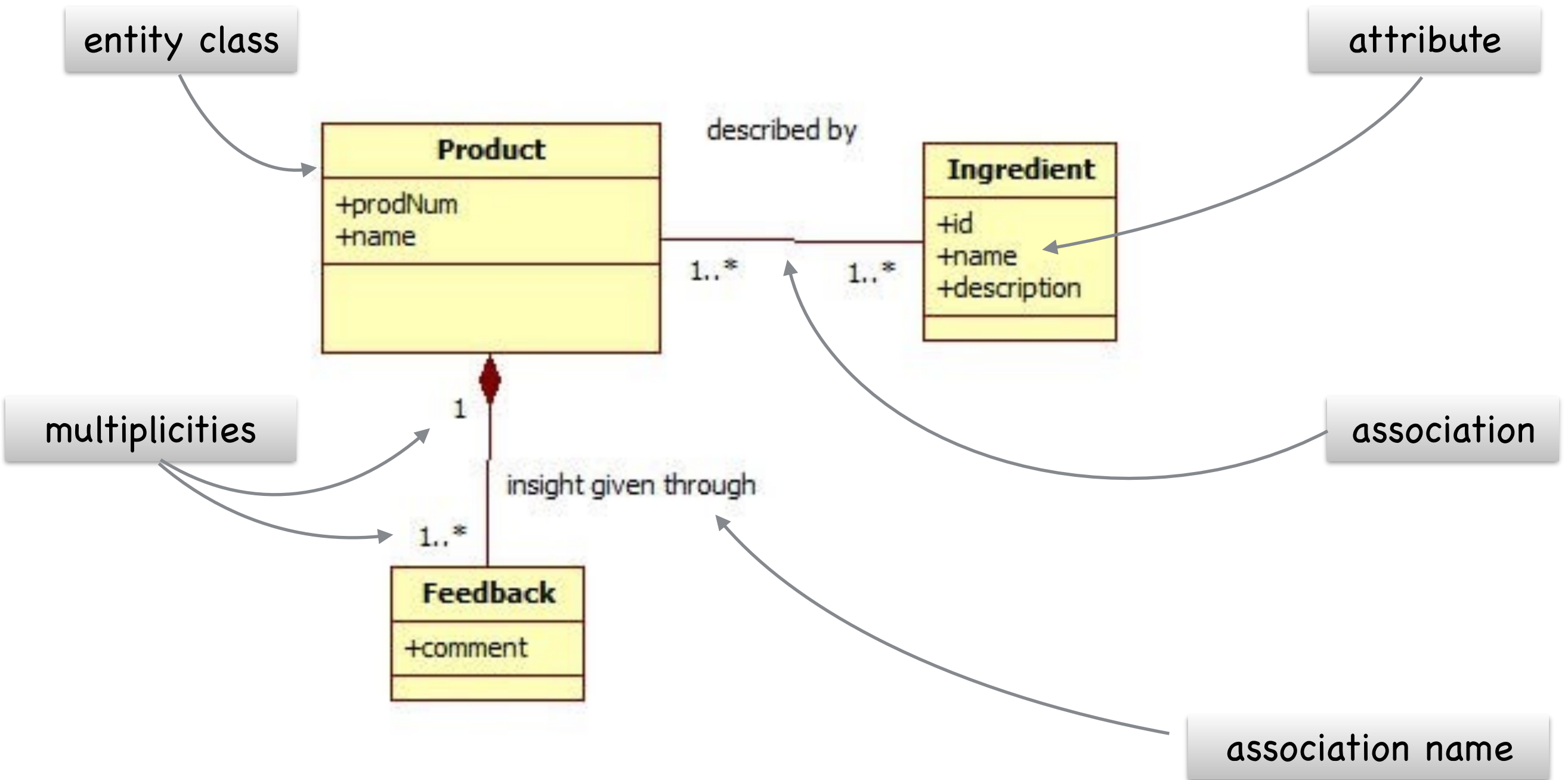
```
class Turntable {  
    int speed;  
    char model[128];  
    ...  
};
```

```
class Record {  
    char artist[128];  
    char song[128];  
    ...  
};
```

Domain Modelling

“...visual representation of conceptual classes or real situation objects in a domain...”

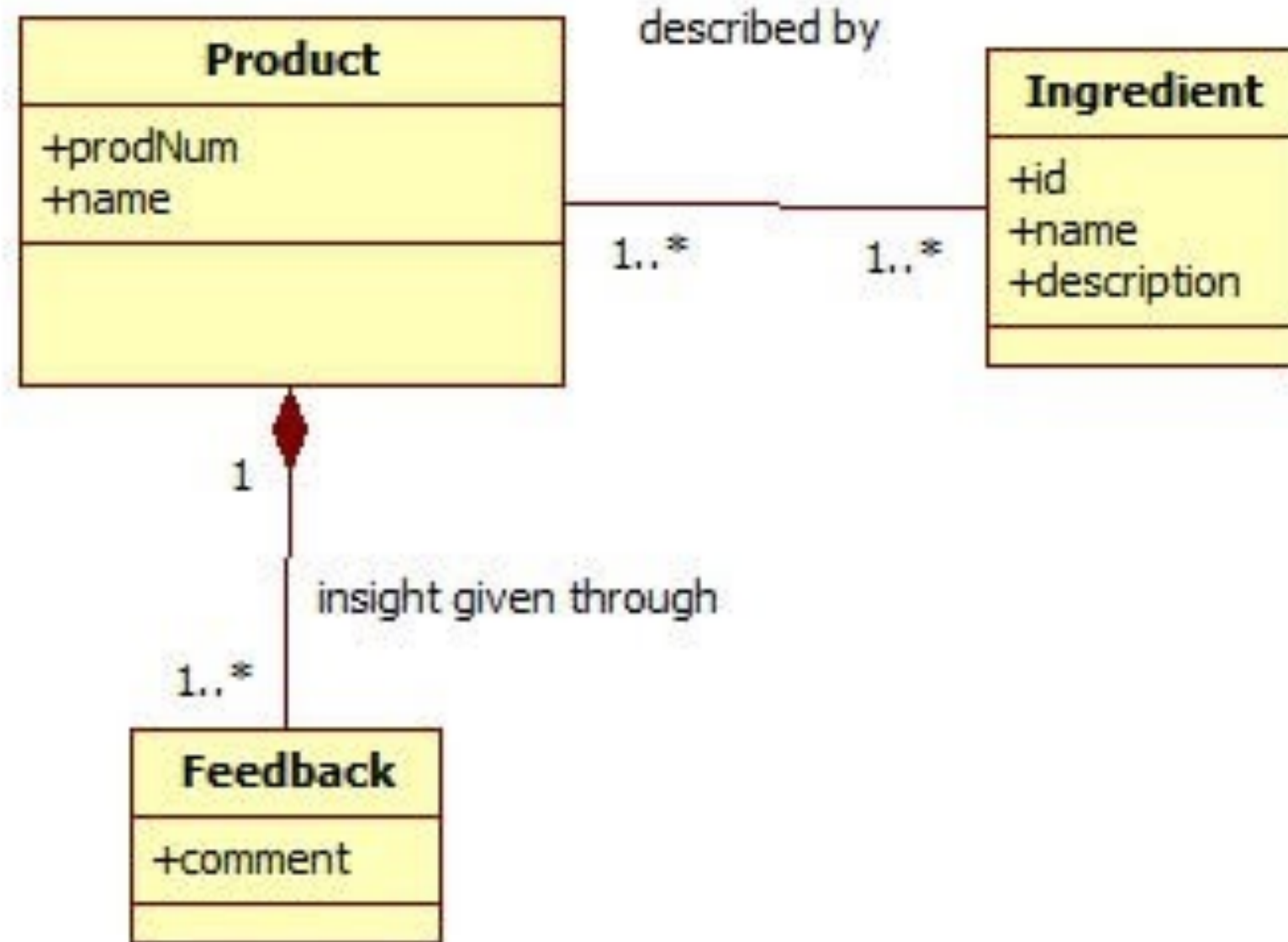




Domain Models

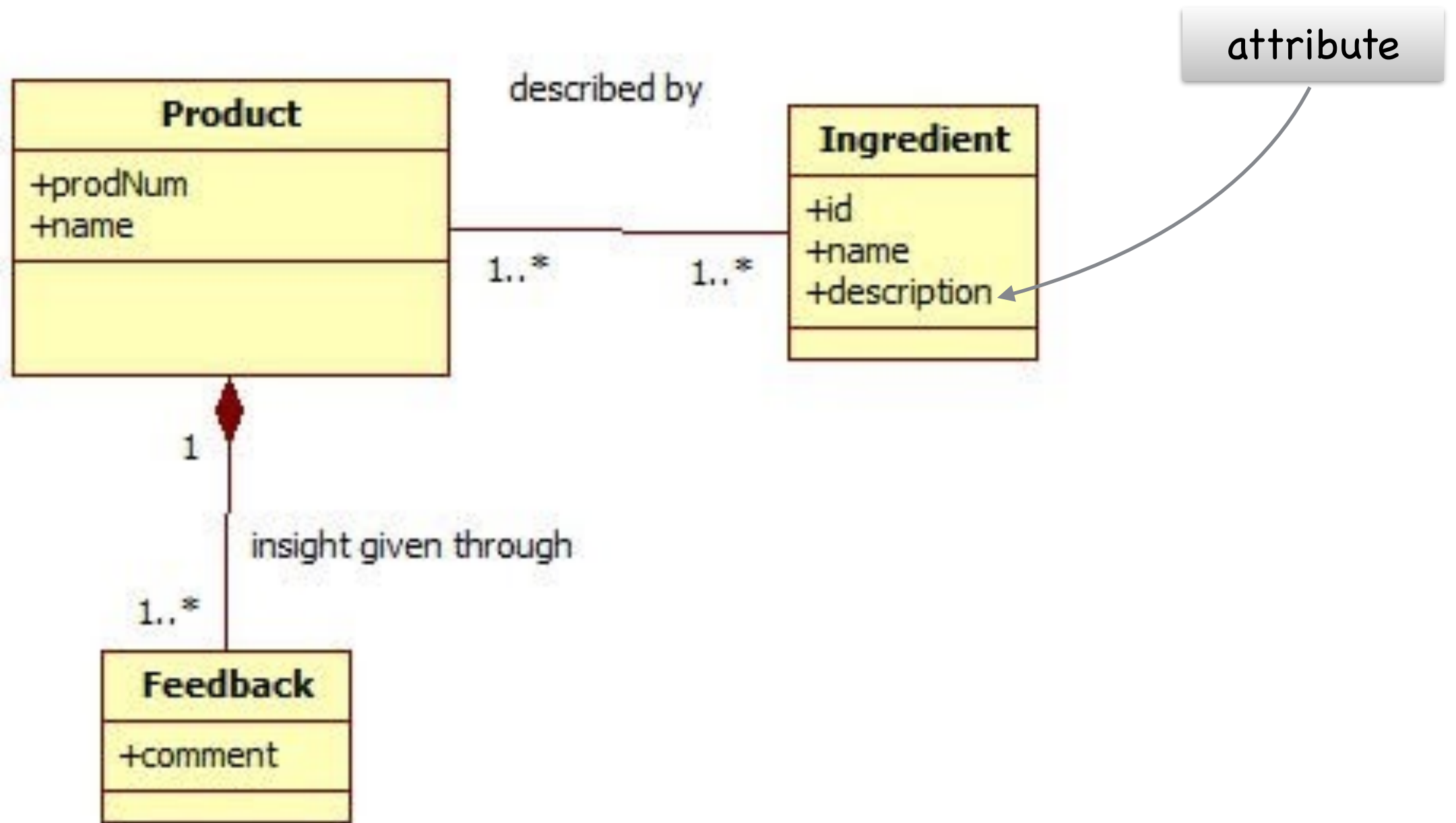
Entity classes are derived from scenarios then a class diagram is created that represents the domain model.

entity class



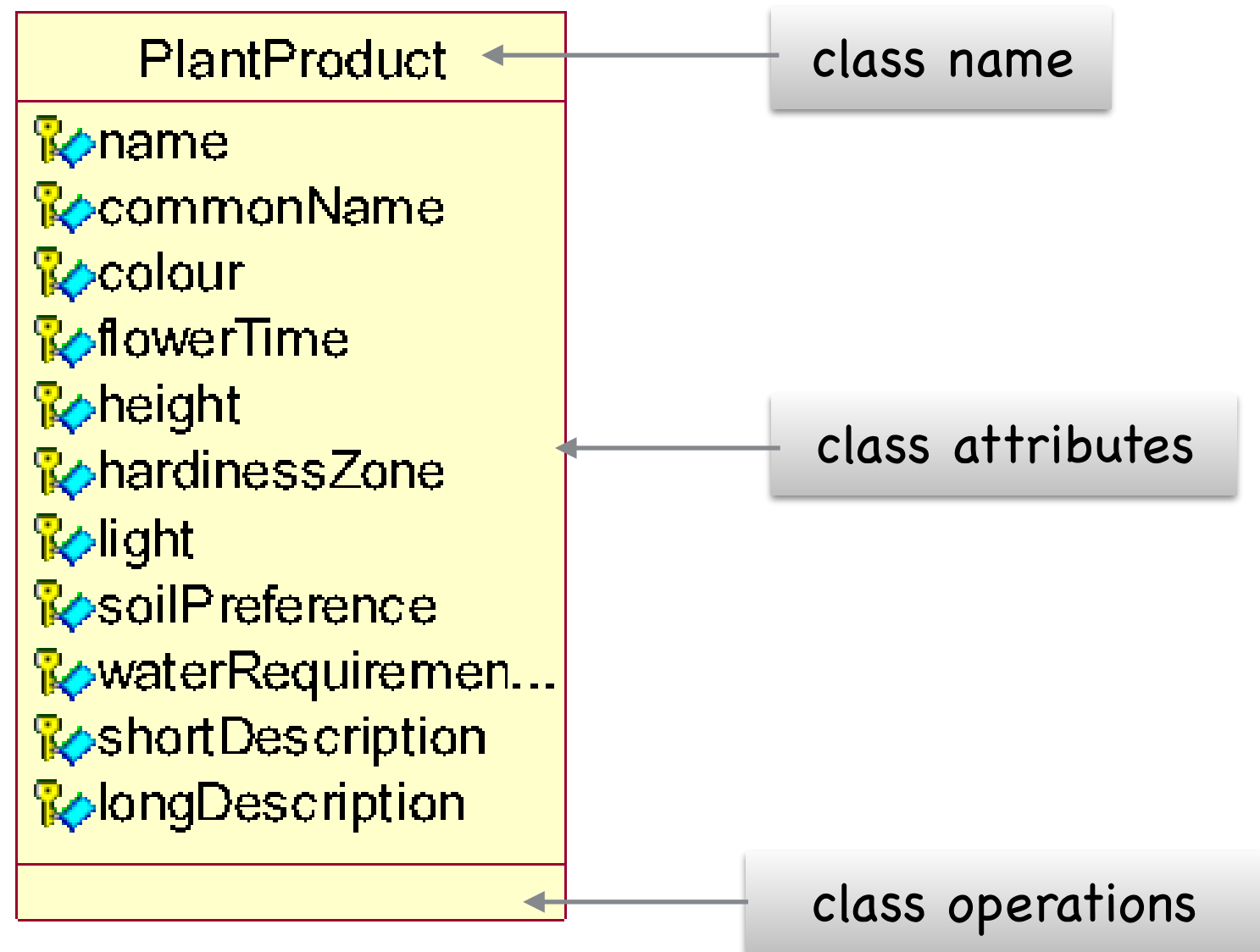
Domain Models

Entity classes are derived from scenarios then a class diagram is created that represents the domain model.



Domain Models

Attributes are properties of a class



Classes in UML

Domain modelling does not involve behaviour so no operations are identified at this point

Finding Classes

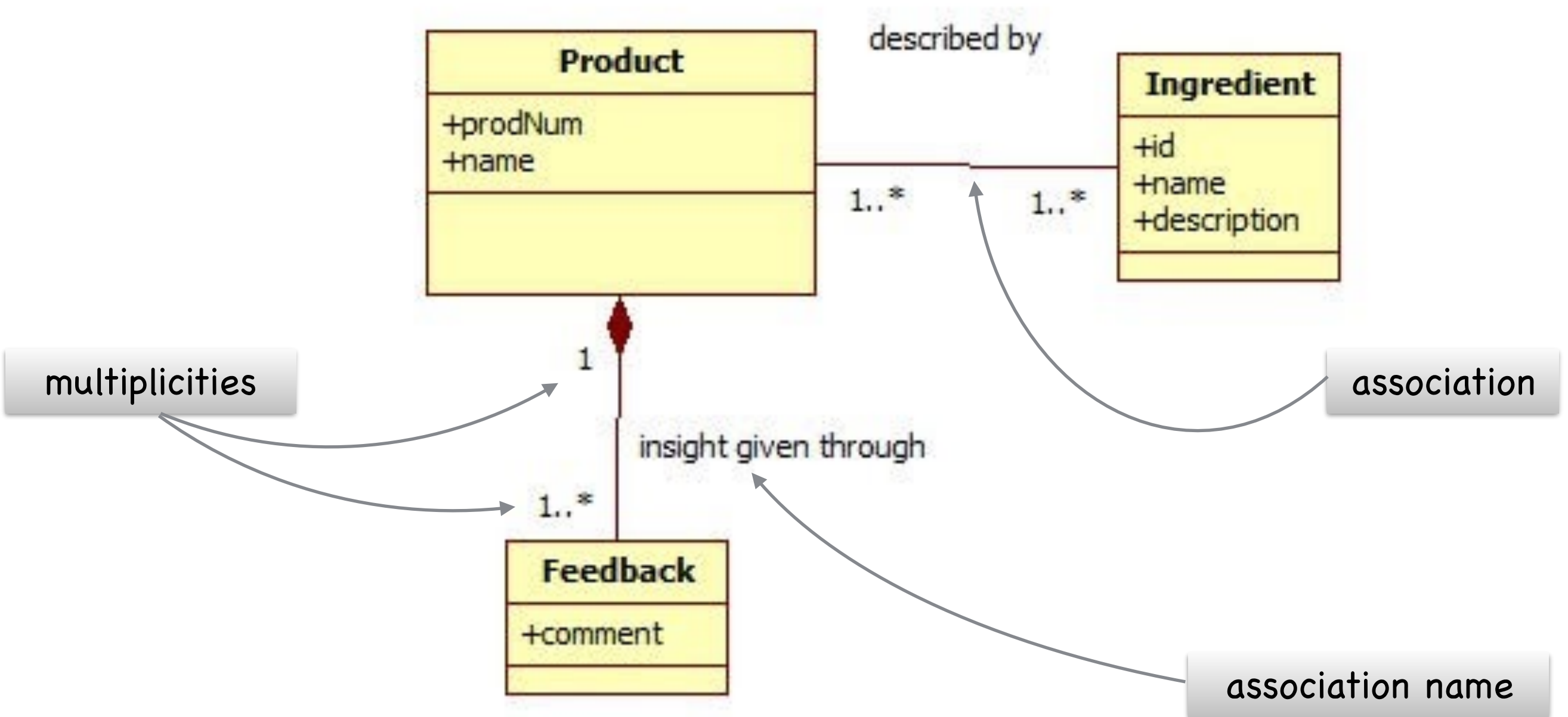
- look for things that represent concepts

-  nouns or noun phrases

-  speaking with domain experts

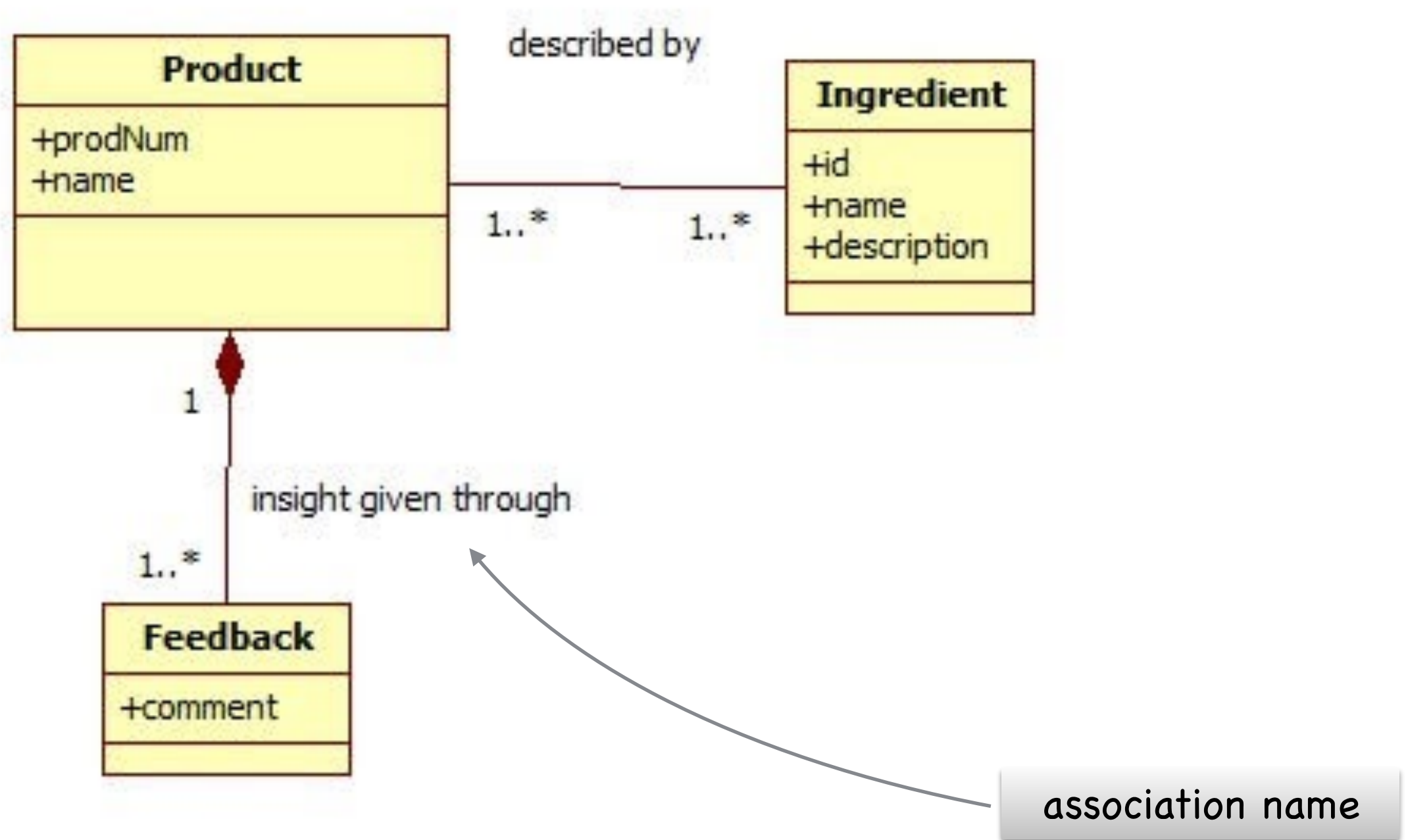
-  looking for known patterns

-  finding descriptions



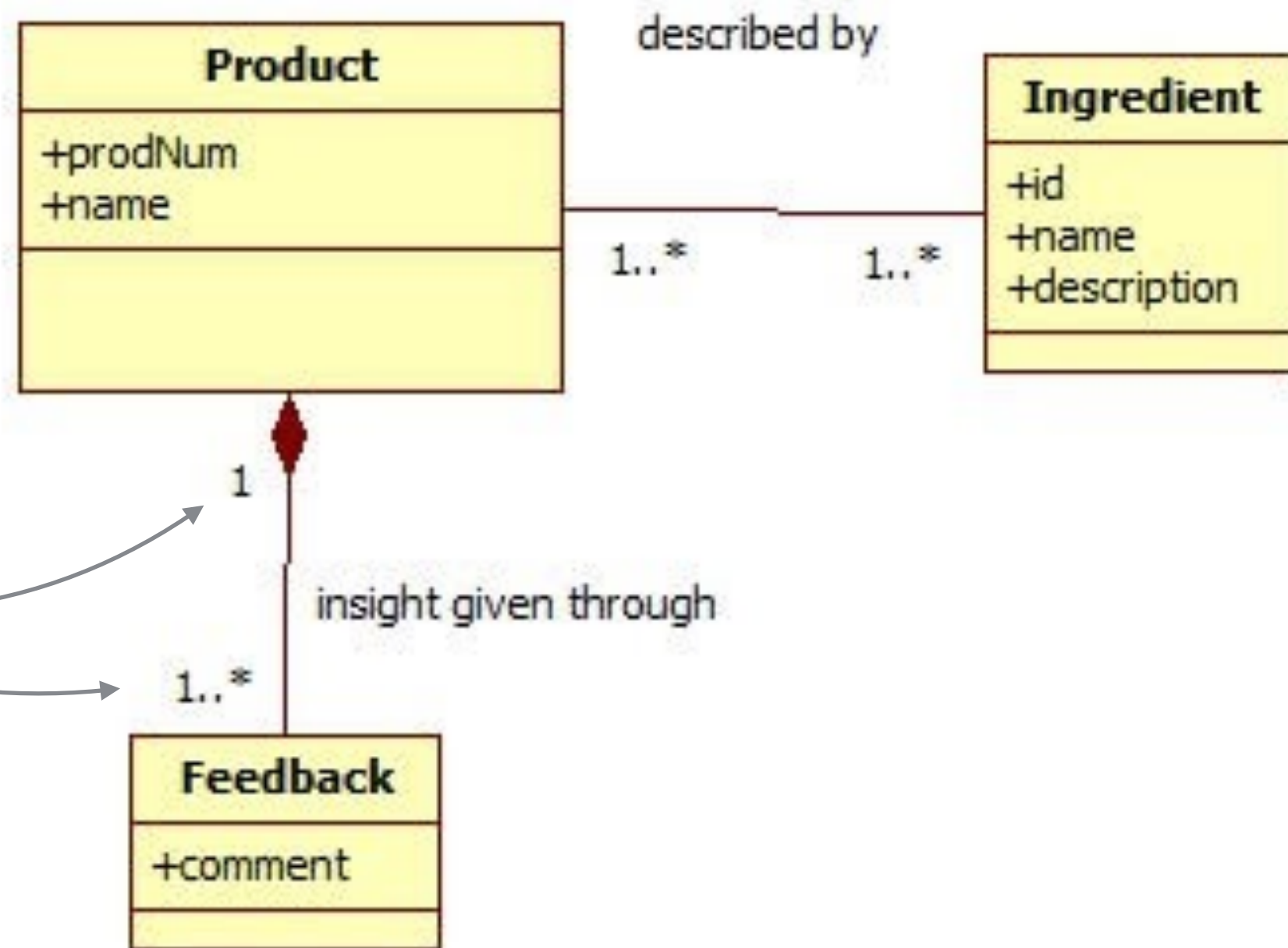
Domain Models

Associations are relationships between classes (or more precisely, objects) that indicate a “meaningful and interesting” connection.



Domain Models

Name describes nature of the association



multiplicities

Domain Models

Association multiplicities indicate the number of objects that can be related to each other at a particular moment