UML Data Modeling I

Classes

- Descriptor of a set of objects that share the same properties (semantics, attributes and relationships)
    - Concrete things
        - person, book, car, ...
    - Conceptual things
        - class, course, profession
- They are characterized by name, attributes and operations
    - for data modelling: drop operations
- The class name is usually written in the singular, with the first letter in uppercase

Attributes

- Attributes are defined in terms of class, while values of the attributes are defined at the instance level
    - A student has the attributes: identifier, name and admission grade
    - John is a student with the ID 123, name John Smith and an admission grade of 180
- A class should not have two attributes with the same name
- Attributes can be associated with types
    - Not predefined in UML
    - Use the ones of the DBMS
- In data modelling, we can also specify a primary key (noted pk)

Associations

- Relationship between objects of two classes

```
_________  Assoc. name  _________
|Class 1|---------------|Class 2|
---------role 1   role 2---------
```

- As an object is an instance of a class, a **link** is an instance of an association
- The name is optional
- There may be more than one association between the same pair of classes
    - Having different names

Multiplicity of Associations

```
_________  Association  _________
|Class 1|---------------|Class 2|
---------           m..n---------
```

- Each object of Class 1 is related to **at least m** and **at most n** objects of Class 2
- A * in place of n stands for *no upper limit*
- Abbreviations
    - stands for 0..*, that is, no restrictions
    - 1 stands for 1..1
- Default: 1..1

Complete associations

- Every object must participate in the association
    - Complete many-to-one
        - 1..* - 1..1
    - Complete one-to-one
        - 1..1 - 1..1
    - Complete many to many
        - 1..* - 1..*