Lecture 7 Class Diagram

A static model that shows the classes and relationships among classes that remain constant in the system over time

Resembles the ERD, but depicts classes which include both behaviors and states, while entities in the ERD include only attributes

Scope not system wide, but pertaining to a single use-case

Example: attributes, operations/methods

Relationships

1. generalization/specialization (“type of”)

2. aggregation/composition (“part-of”)

Association

a natural business association that exists between one or more objects/classes.
Multiplicity
how many instances of one object/class can be associated with one instance of another object/class.

<table>
<thead>
<tr>
<th>Instance(s)</th>
<th>Representation of Instance(s)</th>
<th>Diagram Involving Instance(s)</th>
<th>Explanation of Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exactly one</td>
<td>1</td>
<td><img src="image" alt="Department - Boss" /></td>
<td>A department has one and only one boss.</td>
</tr>
<tr>
<td>Zero or more</td>
<td>0..*</td>
<td><img src="image" alt="Employee - Child" /></td>
<td>An employee has zero to many children.</td>
</tr>
<tr>
<td>One or more</td>
<td>1..*</td>
<td><img src="image" alt="Boss - Employee" /></td>
<td>A boss is responsible for one or more employees.</td>
</tr>
<tr>
<td>Zero or one</td>
<td>0..1</td>
<td><img src="image" alt="Employee - Spouse" /></td>
<td>An employee can be married to zero or no spouse.</td>
</tr>
<tr>
<td>Specified range</td>
<td>2..4</td>
<td><img src="image" alt="Employee - Vacation" /></td>
<td>An employee can take between two to four vacations each year.</td>
</tr>
<tr>
<td>Multiple, disjoint ranges</td>
<td>1..3, 5</td>
<td><img src="image" alt="Employee - Committee" /></td>
<td>An employee is a member of one to three or five committees.</td>
</tr>
</tbody>
</table>

N-ary
Associative Class
Sometimes necessary to describe an association by introducing additional attributes which do not naturally belong to the classes involved in the association.

All together

CRC Card
Class-Responsibility-Collaboration Card

Object Diagram
Models the instances of things contained in class diagram