

Object Relational Mapping (ORM) Technologies

Overview

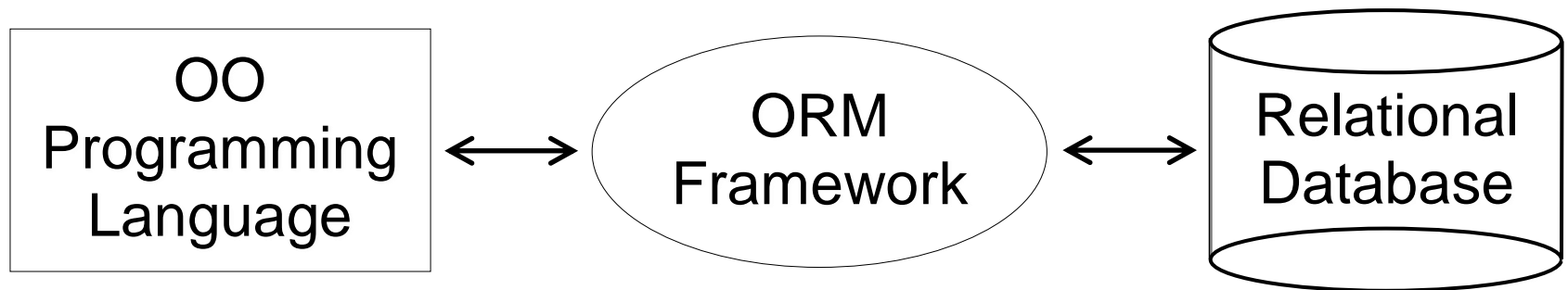
Agenda

1. ORM Overview
2. ORM Technologies

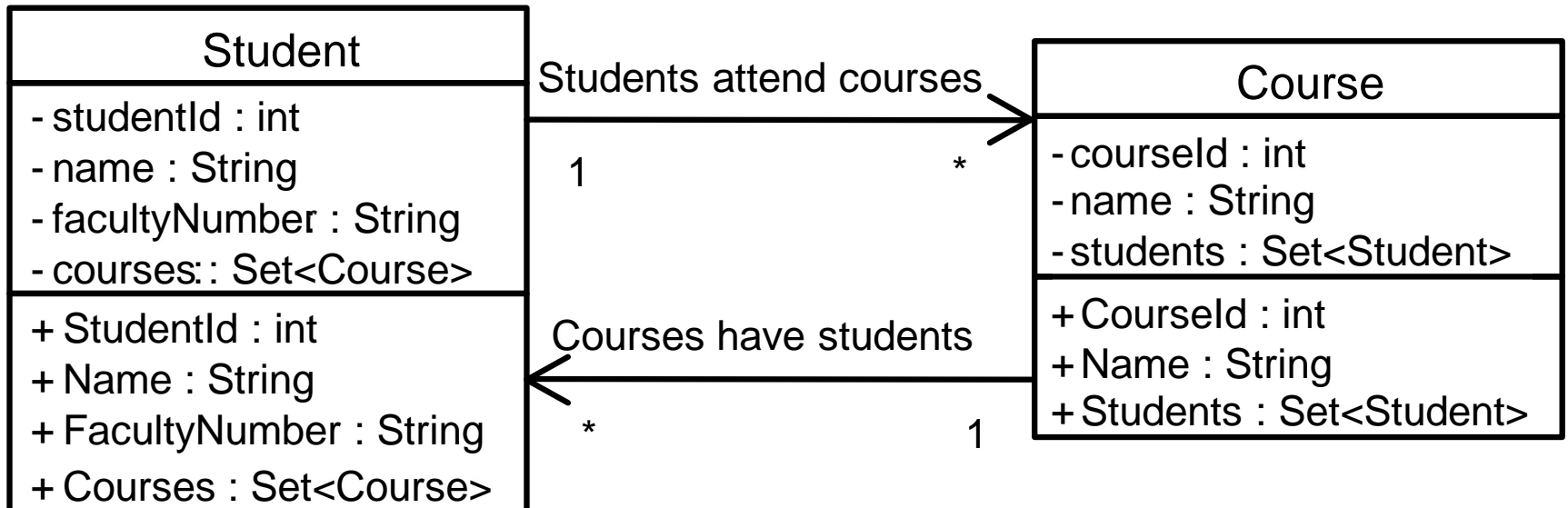
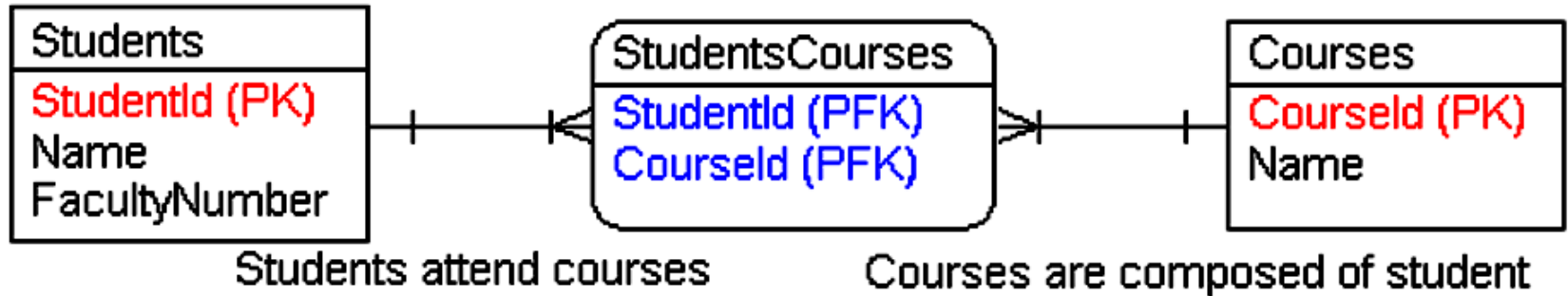
ORM Overview

ORM Overview

- In relational databases, business entities are represented as tables
- In object-oriented languages, business entities are represented as classes
- Object relational mapping frameworks are used for moving business entities from one medium to the other



ORM Overview



ORM Overview

- Benefits in using ORM:

- Increased developer productivity - use objects with associations instead of tables and SQL
- Portability - database vendor independence
- Abstraction - the relational database is represented as Java object model
 - complexity hidden within ORM
 - developer works with objects

ORM Overview

- Benefits in using ORM:
 - Fewer bugs
 - less code
 - code reuse and code generation
 - Improved design
 - Decoupling / separation of concerns

ORM Technologies

ORM Technologies

- **Code Generation Tools**
 - Generate Java, XML and other files
 - Source code is compiled and used
 - Can be highly customized
- **Object Relational Mapping Tools**
 - Mappings are described in XML files
 - No source code generation
 - Use single standard API

ORM Technologies

- Object persistence
 - Create, Retrieve, Update, Delete (CRUD)
 - Find(<criteria>)
- Session management
- Transaction management
 - Automatic / implicit transactions
 - Concurrency control
- Lazy loading
- Soft deletion

ORM Technologies

- Data versioning
- Data caching
- Data validation
 - Content
 - Security
- Audit logging
- Cascade delete / update
- Entity inheritance

ORM Technologies

- In Java SE/Java EE the JPA (Java Persistence API) is a programming interface specification for working with relational databases from Java code
 - entities are Java POJOs (Plain Old Java Objects) - simple Java classes that correspond to relational tables
 - JPQL is the query language used to perform queries against the database in Java by means of the entities (JPA equivalent of SQL)

ORM Technologies

- The JPA specification is derived from features used by already existing ORM frameworks such as Hibernate and Eclipse TopLink (now reference implementation of the EJB 3.0 Java Persistence API)
- JPA is supported in latest versions of most widely used ORM libraries (such as Hibernate and Eclipse TopLink)

ORM Technologies

- Hibernate is an ORM library for Java (since 3.2 provides implementation of JPA):
 - entities are Java POJOs (Plain Old Java Objects) - simple Java classes that correspond to relational tables
 - HQL is the query language used to perform queries against the database in Java by means of the entities (Hibernate equivalent of SQL)
 - Criteria queries are an object-oriented alternative to HQL in Hibernate

ORM Technologies

- Both JPA and Hibernate support configuration via two different mechanisms:
 - XML files
 - Java annotations

Questions?

Problems

1. What is data persistence?
2. What is ORM? Why is it needed?
3. What is code generator? What is ORM mapper? What is the difference?
4. What are the goal of the ORM technologies?
5. What features are available in most ORM tools and framework?