Don't Know Jack About Object-Relational Mapping?

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Agenda

Objects vs. Relational

Mapping

Application Programming Interface

Query

5 Questions

Q & A

Presenter's "Baggage"

Java™ Data Objects Specification Lead

Apache OpenJPA PMC Chair

Java EE Container Managed Persistence Architect

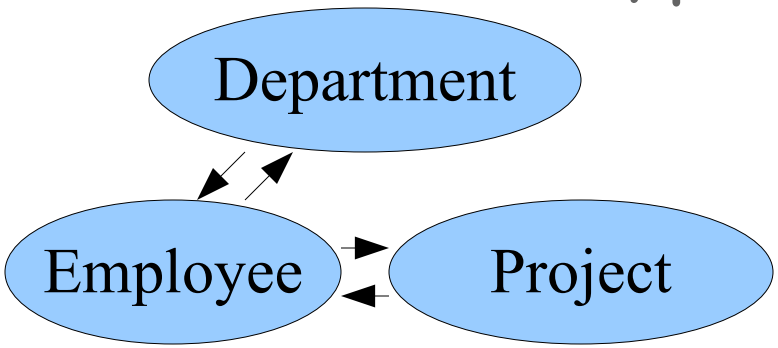
"5" Questions

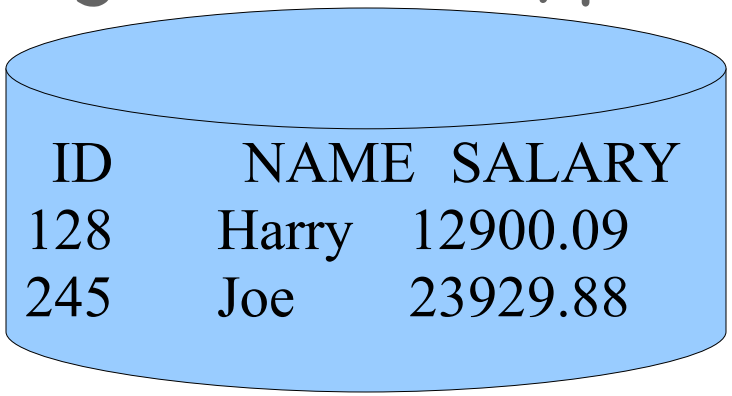
- Did your manager/lead tell you to use ORM?

Objects vs. Relational

- Classes
- Fields
- Methods
- References
- Multi-valued types

- Tables
- Columns
- Stored Procedures
- Foreign Keys
- Single-valued types





Mapping

- Class <--> Table
- Property <--> Column
- Identity <--> Primary Key
- Bidirectional-Relationship <--> Foreign Key
- Inheritance <--> Foreign Key == Primary Key
- HashMap <--> Join Table with 3 columns
- Embedded <--> Multiple Columns
- Class <--> Multiple Tables with same Primary Key

Some Cool ORM Features

- Auto-increment fields/properties
  - Especially useful for primary keys
- Orphan deletion
  - Implements containment (composite) pattern
- Generate source from database schema
  - When you already have a database
- Surrogate (artificial) primary keys
  - Enforces "best practice" automatically

Some (More) Cool ORM Features

- Detached objects
  - Domain objects are DTOs (data transfer objects)
- Life cycle callbacks
  - Aspect-oriented without the pain
- Optimistic locking
  - Use version columns for consistency
- Uniquing
  - Guarantee one object per unique row

"5" Questions

- Did your manager/lead tell you to use ORM?
- How complex is your domain object model?

ORM Language Popularity

- Java **2,620,000** Google hits
- PHP **2,340,000** Google hits
- Javascript **1,350,000** Google hits
- Python **1,200,000** Google hits
- C++ **1,160,000** Google hits
- Perl **881,000** Google hits
- Objective C **84,700** Google hits
- C **34** Google hits

"5" Questions

- Did your manager/lead tell you to use ORM?
- How complex is your domain object model?
- What language is your application?

Alternative Approaches

- Direct API
  - Write SQL, Embed in Statement, Get ResultSet
- SQL Helper Classes
  - Write SQL, Put Results into User's Classes
- Data Access Object
  - Write SQL, Translate Results to Domain Objects
- Object-Relational Mapping
  - Write Mapping, Write Queries in Domain Model
  - Automatic Change Detection

ORM "Potential Benefits"

- Productivity
  - Writing Mapping is faster than writing SQL
- Scalability
  - Fewer team members need to be SQL experts
- Performance
  - ORM can write better SQL than you can
- Quality
  - Complex SQL needs extensive testing
  - Automatic foreign key management

"5" Questions

- Did your manager/lead tell you to use ORM?
- How complex is your domain object model?
- What language is your application?
- Is SQL your native/second language?

Example API

- EntityManagerFactory
  - aka PersistenceManagerFactory, SessionFactory
- EntityManager
  - aka PersistenceManager, Session
- Transaction
- Query
- Query Result

Example: EntityManager

- Primary User API
- Persistent instance life-cycle
  - persist
  - remove
- Retrieve by Id
- Query factory
- Transaction access

Example: EntityManagerFactory

- Factory for EntityManager
- Configuration
  - Connection Properties
- Factory for EntityManager
- Connection Pooling
- Datastore Metadata
- Object Model Metadata
- Mapping Metadata

Example: Query

- Domain Object Model Query
  - Uses Domain Object Model fields
  - Maps 1-1 to SQL
  - Supports Comparison Operators
  - Supports Navigation (Foreign Key Joins)
  - Returns Lists of Domain Objects
- Native (e.g. SQL) Query
  - Mapping of ResultSet to Result Objects

Query

- select e from Employee e
  where name = 'Sam'
- select e from Employee e join projects p
  where salary > 1000 and p.name = 'r6.0'
- select avg(salary) from Employee e
- select name, address into NameAddress
  from Employee e where salary > 1000

"5" Questions

- Did your manager/lead tell you to use ORM?
- How complex is your domain object model?
- What language is your application?
- Is SQL your native/second language?
- How complex are (most of) your queries?

Questions?

Answers!

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