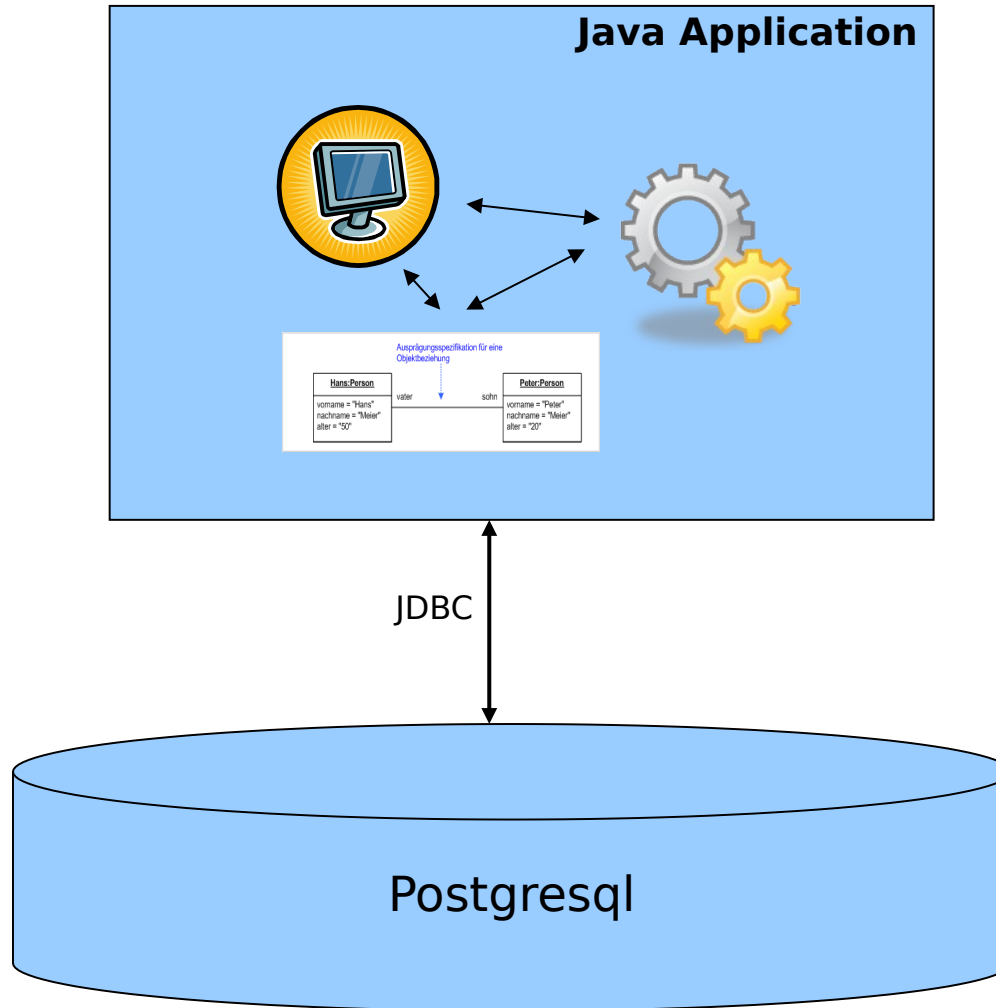


Databases and Information Systems

Relational Database Applications



Overview



JDBC

- Open a connection:

```
Connection con =  
DriverManager.getConnection(  
"jdbc:postgresql://host:port/dbname", "username",  
"passwd");
```

- Execute simple queries:

```
Statement stm = con.createStatement();  
ResultSet rs = stm.executeQuery("SELECT ...");  
int num = stm.executeUpdate("INSERT ...");  
boolean b = stm.execute("sqlquery");
```

JDBC: Prepared Statements

- Precompiled queries with placeholders

Example:

```
PreparedStatement pstmt =  
con.prepareStatement("INSERT INTO  
USERS(UserName, Name, FName) VALUES (?, ?, ?)");
```

```
pstmt.setString(1, "ccanady");  
pstmt.setString(2, "Craig");  
pstmt.setString(3, "Canady");  
pstmt.executeUpdate();
```

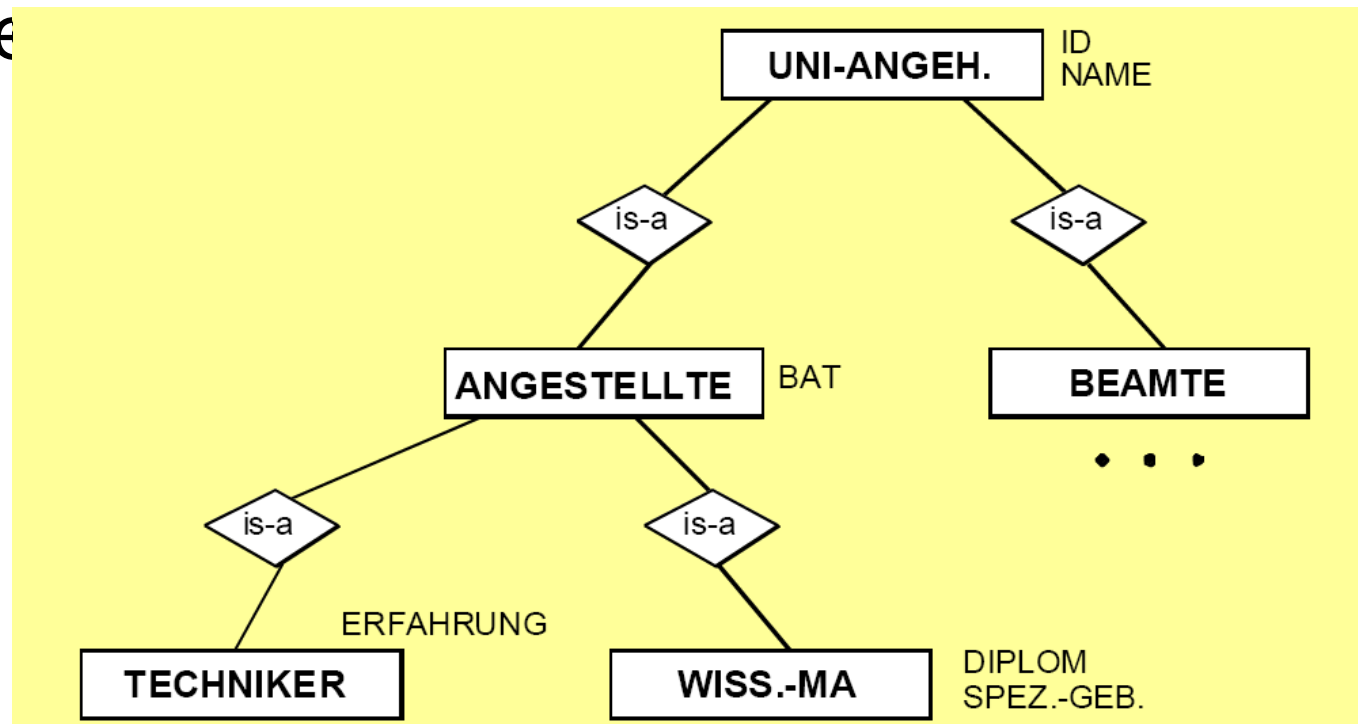
JDBC: Transaction Handling

- JDBC Default: Each statement executes in a transaction (autocommit mode)
- Might lead to inconsistencies!
- Controlling autocommit:

```
con.setAutoCommit(false);  
//perform insert/update/delete operations  
...  
if(success)  
    con.commit();  
else  
    con.rollback();
```

Generalisation in the relational model

- RM has no inheritance
- “Faking” inheritance is limited
- Example



Generalisation: Horizontal Partitioning

- Horizontal Partitioning
 - Each instance is saved only once in its respective table (*Table per Class*)

			UNI-ANGEH.	ID	NAME
				111	Ernie
			ANGESTELLTE	ID	NAME
				007	Garfield
					Ia
TECHNIKER		ID	ERFAHRUNG	NAME	BAT
		123	SUN	Donald	IVa
WISS.-MA.	ID	DIPLOM	SEPZ.-GEB.	NAME	BAT
	333	Informatik	RECOVERY	Daisy	Ila
	765	Mathematik	ERM	Grouch	Ila

Generalisation: Vertical Partitioning

- Instances are decomposed by their properties (*Joined Subclasses*)
- ID is duplicated

UNI-ANGEH.	ID	NAME	ANGESTELLTE	ID	BAT
	007	Garfield		007	Ia
	111	Ernie		123	IVa
	123	Donald		333	IIa
	333	Daisy		765	IIa
	765	Grouch			

TECHNIKER	ID	ERFAHRUNG
	123	SUN

WISS.-MA	ID	DIPLOM	SPEZ.-GEB
	333	Informatik	ERM
	765	Mathematik	MAD

Generalisation: Full Redundancy

- Each instance is saved in every table of its inheritance hierarchy
- Attributes are repeated

UNI-ANGEH.	ID	NAME	ANGESTELLTE	ID	NAME	BAT
	007	Garfield		007	Garfield	Ia
	111	Ernie		123	Donald	IVa
	123	Donald		333	Daisy	Ila
	333	Daisy		765	Grouch	Ila
	765	Grouch				

TECHNIKER	ID	NAME	BAT	ERFAHRUNG
	123	Donald	IVa	SUN

WISS.-MA	ID	NAME	BAT	DIPLOM	SPEZ.-GEB.
	333	Daisy	Ila	Informatik	RECOVERY
	765	Grouch	Ila	Mathematik	ERM

Generalisation: Single Table

- Considered unelegant
- All instances are saved in one table
- Non-existing attributes are NULled
- *Discriminator Column*: Indicates Type of the row