

# **Systems for Design and Implementation**

## **Lecture 3**

### **Outline**

- Reflection
- JDBC

# Reflection

- a language's ability to inspect and dynamically call classes, methods, attributes at runtime
- applications: IDEs, debuggers, testing frameworks etc

`java.lang.Class`

`java.lang.reflect`

[reflectionclassdiagram](#)

[reflection](#)

# JDBC

java.sql

## 1. Key interfaces

- Driver
- Connection
- Statement/PreparedStatement
- ResultSet

pgAdmin

*IntelliJ Idea Database Tools*

## 2. Connecting to a database

### The JDBC URL

jdbc:postgresql://localhost:5432/catalog

### Getting a Database *Connection*

DriverManager.getConnection(...)

Postgresql-9.4.1208.jar

runtime group: 'org.postgresql', name: 'postgresql', version: '42.0.0'

## 3. Getting a *Statement/PreparedStatement*

~~connection.createStatement()~~

connection.prepareStatement(sqlString)

preparedStatement.setXXX(paramIndex, paramValue)

//paramIndex starts with 1

## 4. Getting a *ResultSet*

preparedStatement.executeQuery()

### Executing a statement

preparedStatement.executeUpdate()

## Getting Data from a *ResultSet*

```
while(resultSet.next()){
    XXX value = resultSet.getXXX(columnName)
    //or
    XXX value = resultSet.getXXX(columnIndex)
}
```

### ?Describe what is happening in the following situations

```
1. ResultSet rs = stmt.executeQuery("select count(*)
   from student");
2. if (rs.next()){ int id = rs.getInt(0);}
```

```
1. ResultSet rs = stmt.executeQuery("select * from
   student where name = 'does not exist'");
2. rs.next();
3. int id = rs.getInt(1);
```

```
1. ResultSet rs = stmt.executeQuery("select count(*)
   from student");
2. int id = rs.getInt(1);
```

## 5. Closing DB resources

### How many resources are closed in the following code?

```
try (Connection conn =
    DriverManager.getConnection(url);
    Statement stmt = conn.createStatement();
    ResultSet rs = stmt.executeQuery("...")){

    if (rs.next()){System.out.println("hello1");}
    ResultSet rs2 = stmt.executeQuery("...");
    int num = stmt.executeUpdate("...");
}
```

jdbc