

Java JSON Data Binding



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- Data binding is the process of converting JSON data to a Java POJO

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JSON



Java
POJO

Java JSON Data Binding

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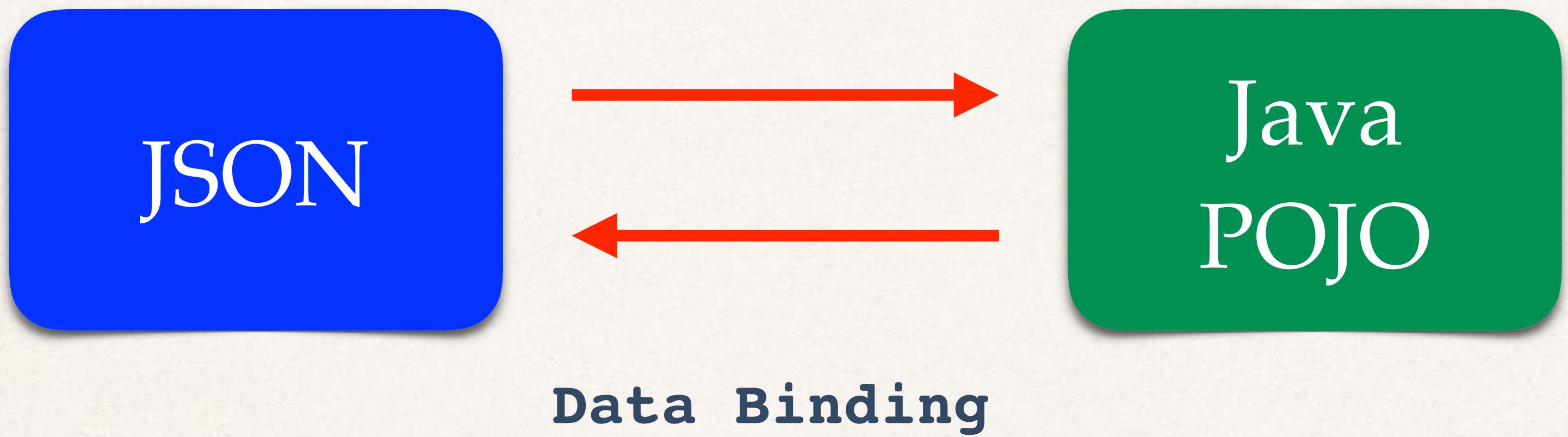
Java JSON Data Binding

- Data binding is the process of converting JSON data to a Java POJO



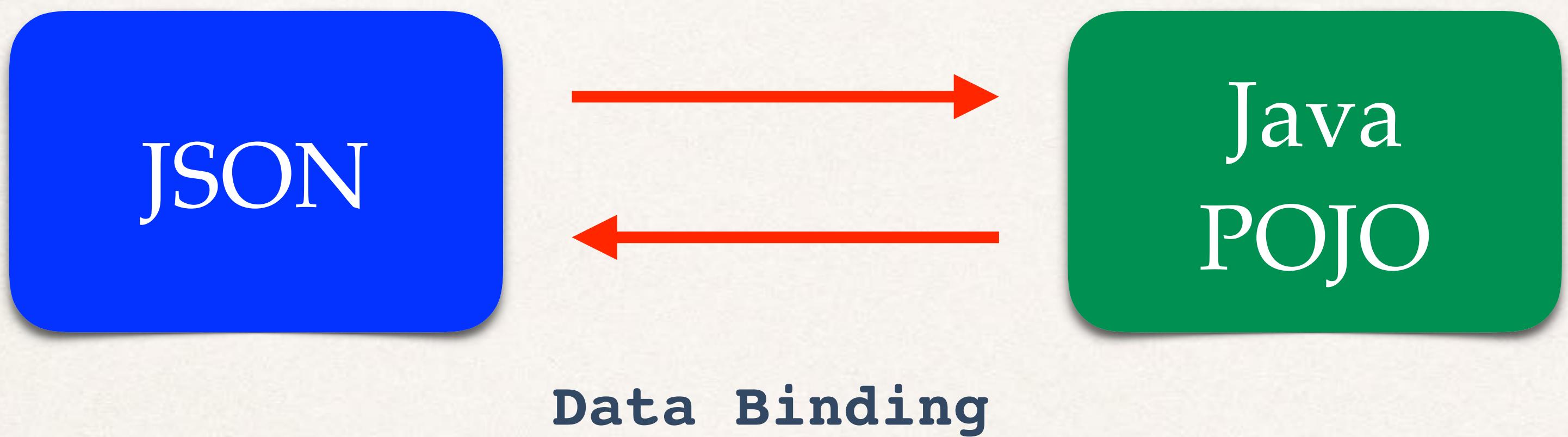
Java JSON Data Binding

- Data binding is the process of converting JSON data to a Java POJO



Java JSON Data Binding

- Data binding is the process of converting JSON data to a Java POJO



Also known as

Mapping

Serialization / Deserialization

Marshalling / Unmarshalling

JSON Data Binding with Jackson

JSON Data Binding with Jackson

- Spring uses the **Jackson Project** behind the scenes

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- Jackson handles data binding between JSON and Java POJO

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- Details on Jackson Project:

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<https://github.com/FasterXML/jackson-databind>

Jackson Data Binding

Jackson Data Binding

- Jackson Data Binding API

Jackson Data Binding

- Jackson Data Binding API
 - Package: **com.fasterxml.jackson.databind**

Jackson Data Binding

- Jackson Data Binding API
 - Package: **com.fasterxml.jackson.databind**
- Maven Dependency

```
<dependency>
  <groupId>com.fasterxml.jackson.core</groupId>
  <artifactId>jackson-databind</artifactId>
  <version>2.9.0</version>
</dependency>
```

Jackson Data Binding

Jackson Data Binding

- By default, Jackson will call appropriate getter / setter method

Jackson Data Binding

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```
{  
    "id": 14,  
  
    "firstName": "Mario",  
  
    "lastName": "Rossi",  
  
    "active": true  
}
```

Jackson Data Binding

- By default, Jackson will call appropriate getter / setter method

```
{  
    "id": 14,  
  
    "firstName": "Mario",  
  
    "lastName": "Rossi",  
  
    "active": true  
}
```

Java
POJO

Student

Jackson Data Binding

- By default, Jackson will call appropriate getter / setter method

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{  
    "id": 14,  
  
    "firstName": "Mario",  
  
    "lastName": "Rossi",  
  
    "active": true  
}
```



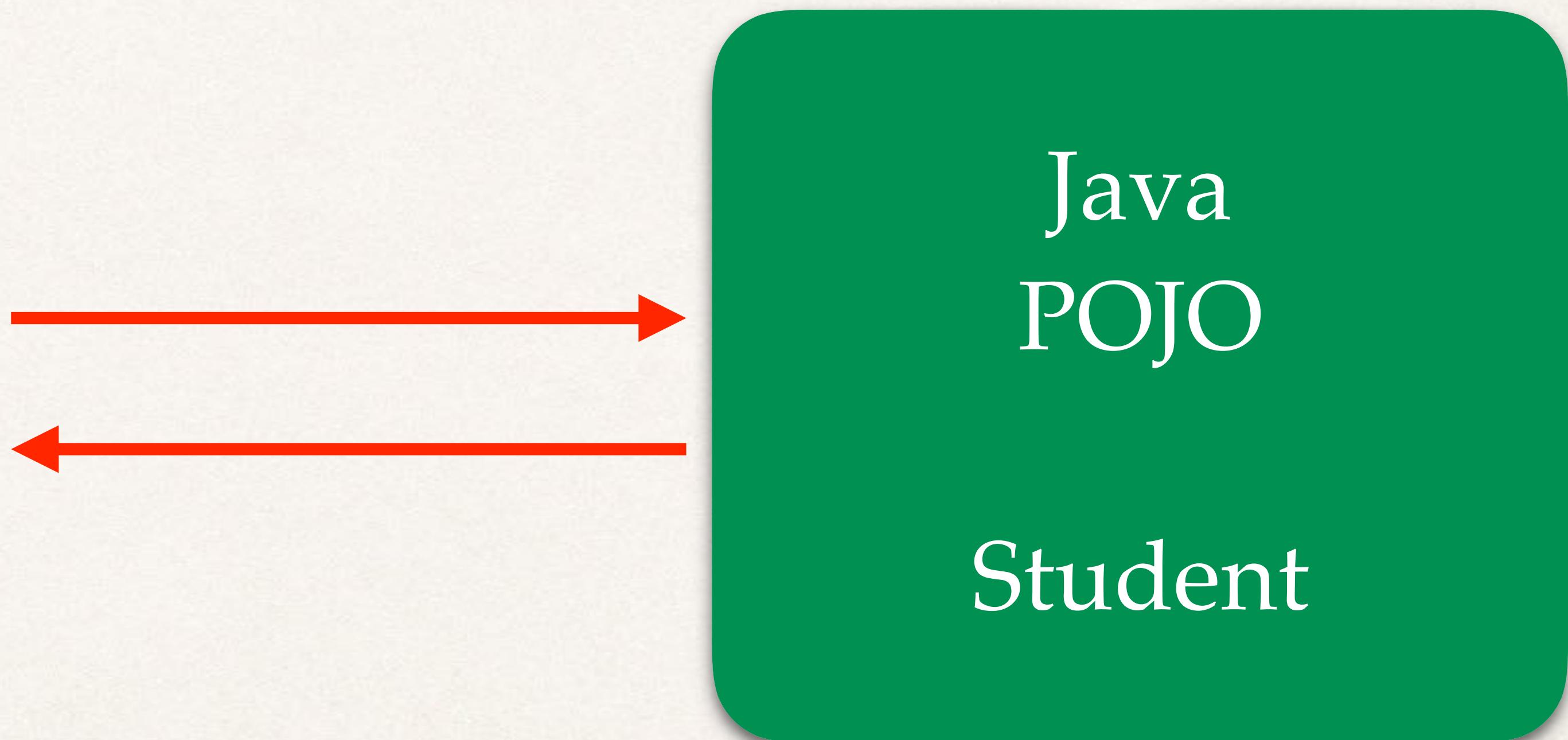
Java
POJO

Student

Jackson Data Binding

- By default, Jackson will call appropriate getter / setter method

```
{  
    "id": 14,  
  
    "firstName": "Mario",  
  
    "lastName": "Rossi",  
  
    "active": true  
}
```



JSON to Java POJO

JSON to Java POJO

- Convert JSON to Java POJO ... call setter methods on POJO

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{  
  "id": 14,  
  
  "firstName": "Mario",  
  
  "lastName": "Rossi",  
  
  "active": true  
}
```

Java
POJO

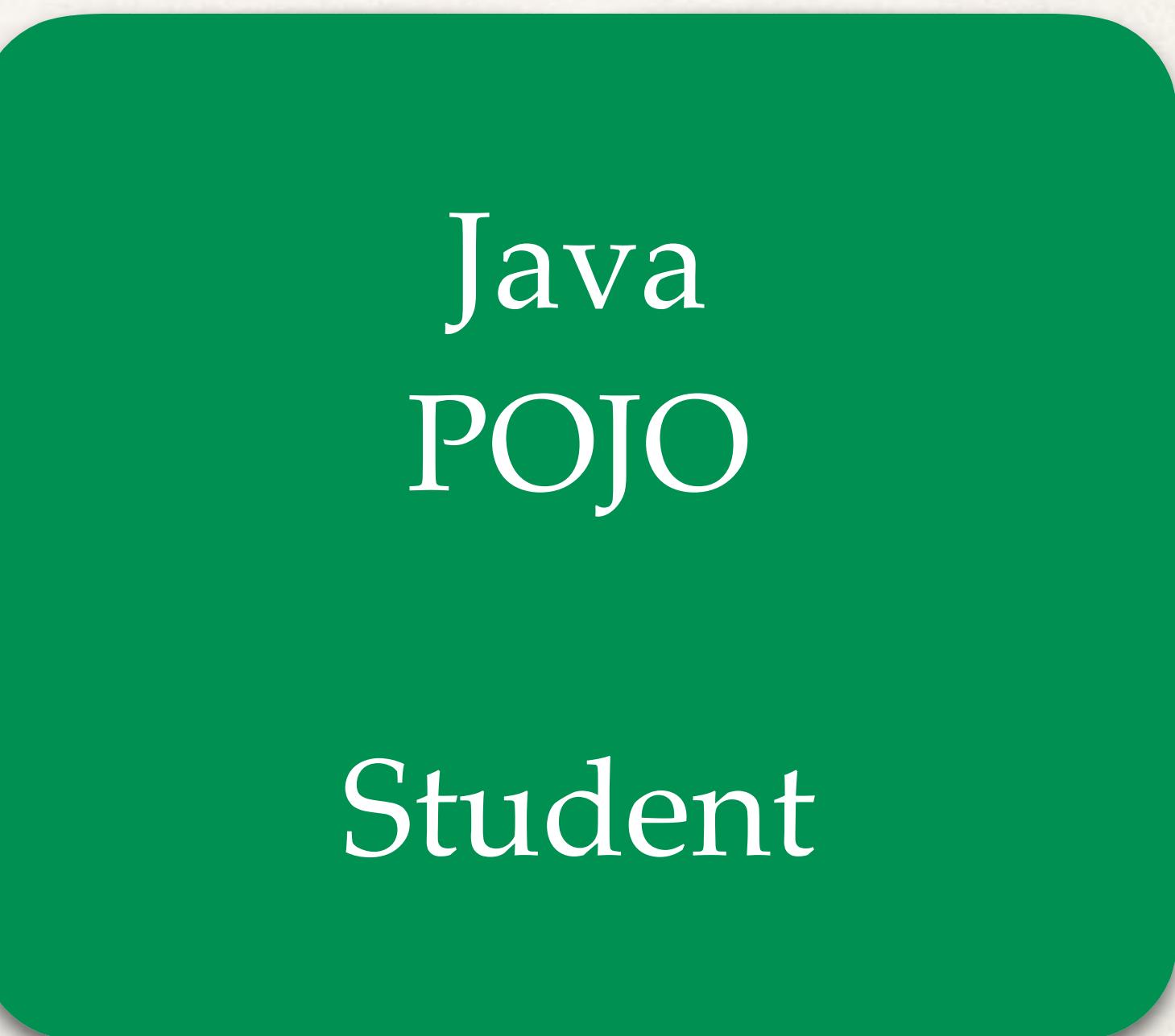
Student

JSON to Java POJO

- Convert JSON to Java POJO ... call setter methods on POJO

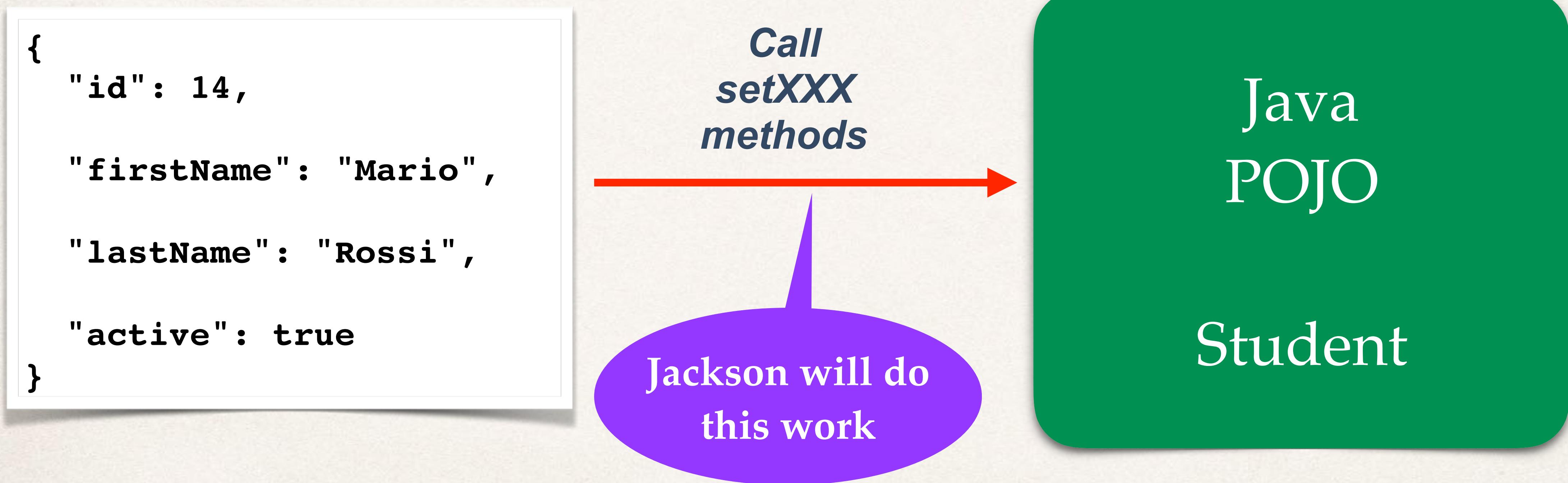
```
{  
    "id": 14,  
  
    "firstName": "Mario",  
  
    "lastName": "Rossi",  
  
    "active": true  
}
```

*Call
setXXX
methods*



JSON to Java POJO

- Convert JSON to Java POJO ... call setter methods on POJO



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{  
  "id": 14,  
  
  "firstName": "Mario",  
  
  "lastName": "Rossi",  
  
  "active": true  
}
```

JSON to Java POJO

- Convert JSON to Java POJO ... call setter methods on POJO

```
{  
  "id": 14,  
  
  "firstName": "Mario",  
  
  "lastName": "Rossi",  
  
  "active": true  
}
```

```
public class Student {  
  
    private int id;  
    private String firstName;  
    private String lastName;  
    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
  
    public void setActive(boolean active) {  
        this.active = active;  
    }  
  
    // getter methods  
}
```

JSON to Java POJO

- Convert JSON to Java POJO ... call setter methods on POJO

```
{  
  "id": 14,  
  
  "firstName": "Mario",  
  
  "lastName": "Rossi",  
  
  "active": true  
}
```

Call setId(...)

```
public class Student {  
  
    private int id;  
    private String firstName;  
    private String lastName;  
    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
  
    public void setActive(boolean active) {  
        this.active = active;  
    }  
  
    // getter methods  
}
```

JSON to Java POJO

- Convert JSON to Java POJO ... call setter methods on POJO

```
{  
  "id": 14,  
  
  "firstName": "Mario",  
  
  "lastName": "Rossi",  
  
  "active": true  
}
```

Call setId(...)

Jackson will do
this work

```
public class Student {  
  
    private int id;  
    private String firstName;  
    private String lastName;  
    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
  
    public void setActive(boolean active) {  
        this.active = active;  
    }  
  
    // getter methods  
}
```

JSON to Java POJO

- Convert JSON to Java POJO ... call setter methods on POJO

```
{  
  "id": 14,  
  
  "firstName": "Mario",  
  
  "lastName": "Rossi",  
  
  "active": true  
}
```

Call setId(...)

Call setFirstName(...)

```
public class Student {  
  
    private int id;  
    private String firstName;  
    private String lastName;  
    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
  
    public void setActive(boolean active) {  
        this.active = active;  
    }  
  
    // getter methods  
}
```

JSON to Java POJO

- Convert JSON to Java POJO ... call setter methods on POJO

```
{  
  "id": 14,  
  
  "firstName": "Mario",  
  
  "lastName": "Rossi",  
  
  "active": true  
}
```

Call setId(...)

Call setFirstName(...)

Call setLastName(...)

```
public class Student {  
  
    private int id;  
    private String firstName;  
    private String lastName;  
    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
  
    public void setActive(boolean active) {  
        this.active = active;  
    }  
  
    // getter methods  
}
```

JSON to Java POJO

- Convert JSON to Java POJO ... call setter methods on POJO

```
{  
  "id": 14,  
  "firstName": "Mario",  
  "lastName": "Rossi",  
  "active": true  
}
```

Call setId(...)

Call setFirstName(...)

Call setLastName(...)

Call setActive(...)

```
public class Student {  
  
    private int id;  
    private String firstName;  
    private String lastName;  
    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
  
    public void setActive(boolean active) {  
        this.active = active;  
    }  
  
    // getter methods  
}
```

JSON to Java POJO

Note: Jackson calls the setXXX methods
It does NOT access internal private fields directly

- Convert JSON to Java POJO ... call setter methods on POJO

```
{  
  "id": 14,  
  
  "firstName": "Mario",  
  
  "lastName": "Rossi",  
  
  "active": true  
}
```

Call setId(...)

Call setFirstName(...)

Call setLastName(...)

Call setActive(...)

```
public class Student {  
  
    private int id;  
    private String firstName;  
    private String lastName;  
    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
  
    public void setActive(boolean active) {  
        this.active = active;  
    }  
  
    // getter methods  
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```

JSON to Java POJO

JSON to Java POJO

```
import java.io.File;  
  
import com.fasterxml.jackson.databind.ObjectMapper;
```

JSON to Java POJO

```
import java.io.File;  
  
import com.fasterxml.jackson.databind.ObjectMapper;  
  
public class Driver {  
  
    public static void main(String[] args) throws Exception {
```

JSON to Java POJO

```
import java.io.File;

import com.fasterxml.jackson.databind.ObjectMapper;

public class Driver {

    public static void main(String[] args) throws Exception {

        // create object mapper
        ObjectMapper mapper = new ObjectMapper();
```

JSON to Java POJO

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import java.io.File;  
  
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```

JSON to Java POJO

```
import java.io.File;

import com.fasterxml.jackson.databind.ObjectMapper;

public class Driver {

    public static void main(String[] args) throws Exception {

        // create object mapper
        ObjectMapper mapper = new ObjectMapper();

        // read JSON from file and map/convert to Java POJO
        Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);
    }
}
```

JSON to Java POJO

```
import java.io.File;  
  
import com.fasterxml.jackson.databind.ObjectMapper;  
  
public class Driver {  
  
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public class Student {  
  
    private int id;  
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    public void setId(int id) {  
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        this.firstName = firstName;  
    }  
  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
  
    public void setActive(boolean active) {  
        this.active = active;  
    }  
  
    // getter methods  
}  
  
{  
    "id": 14, Call setId(...)  
    "firstName": "Mario", Call setFirstName(...)  
    "lastName": "Rossi", Call setLastName(...)  
    "active": true Call setActive(...)  
}
```

JSON to Java POJO

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import java.io.File;  
  
import com.fasterxml.jackson.databind.ObjectMapper;  
  
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    }  
}
```

```
{  
    "id": 14,  
    "firstName": "Mario",  
    "lastName": "Rossi",  
    "active": true  
}
```

Call setId(...)

Call setFirstName(...)

Call setLastName(...)

Call setActive(...)

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public class Student {  
  
    private int id;  
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    }  
}
```

```
{  
    "id": 14,  
    "firstName": "Mario",  
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    "active": true  
}
```

Call setId(...)

Call setFirstName(...)

Call setLastName(...)

Call setActive(...)

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public class Student {  
  
    private int id;  
    private String firstName;  
    private String lastName;  
    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
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        this.lastName = lastName;  
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        Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);  
    }  
}
```

```
{  
    "id": 14,  
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}
```

Call setId(...)

Call setFirstName(...)

Call setLastName(...)

Call setActive(...)

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public class Student {  
  
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        this.lastName = lastName;  
    }  
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        this.active = active;  
    }  
    // getter methods  
}
```

1. Read data from this file

JSON to Java POJO

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import java.io.File;  
  
import com.fasterxml.jackson.databind.ObjectMapper;  
  
public class Driver {  
  
    public static void main(String[] args) throws Exception {  
  
        // create object mapper  
        ObjectMapper mapper = new ObjectMapper();  
  
        // read JSON from file and map/convert to Java POJO  
        Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);  
    }  
}
```

```
{  
    "id": 14,  
    "firstName": "Mario",  
    "lastName": "Rossi",  
    "active": true  
}
```

Call setId(...)

Call setFirstName(...)

Call setLastName(...)

Call setActive(...)

```
public class Student {  
  
    private int id;  
    private String firstName;  
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    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
    public void setActive(boolean active) {  
        this.active = active;  
    }  
    // getter methods  
}
```

1. Read data from this file

2. Create an instance of this class and populate it

JSON to Java POJO

```
import java.io.File;  
  
import com.fasterxml.jackson.databind.ObjectMapper;  
  
public class Driver {  
  
    public static void main(String[] args) throws Exception {  
  
        // create object mapper  
        ObjectMapper mapper = new ObjectMapper();  
  
        // read JSON from file and map/convert to Java POJO  
        Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);  
  
        // also print individual items  
        System.out.println("First name = " + myStudent.getFirstName());  
        System.out.println("Last name = " + myStudent.getLastName());  
  
    }  
}
```

```
{  
    "id": 14, Call setId(...)  
    "firstName": "Mario", Call setFirstName(...)  
    "lastName": "Rossi", Call setLastName(...)  
    "active": true Call setActive(...)  
}
```

```
public class Student {  
    private int id;  
    private String firstName;  
    private String lastName;  
    private boolean active;  
  
    public void setId(int id) {  
        this.id = id;  
    }  
    public void setFirstName(String firstName) {  
        this.firstName = firstName;  
    }  
    public void setLastName(String lastName) {  
        this.lastName = lastName;  
    }  
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```

JSON to Java POJO

```
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public class Driver {  
  
    public static void main(String[] args) throws Exception {  
  
        // create object mapper  
        ObjectMapper mapper = new ObjectMapper();  
  
        // read JSON from file and map/convert to Java POJO  
        Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);  
  
        // also print individual items  
        System.out.println("First name = " + myStudent.getFirstName());  
        System.out.println("Last name = " + myStudent.getLastName());  
    }  
}
```



Output

```
First name = Mario  
Last name = Rossi
```

Java POJO to JSON

Java POJO to JSON

- Now, let's go the other direction
- Convert Java POJO to JSON ... call getter methods on POJO

Java POJO to JSON

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Java
POJO

Student

Java POJO to JSON

- Now, let's go the other direction
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Java POJO to JSON

- Now, let's go the other direction
- Convert Java POJO to JSON ... call getter methods on POJO

```
{  
    "id": 14,  
  
    "firstName": "Mario",  
  
    "lastName": "Rossi",  
  
    "active": true  
}
```



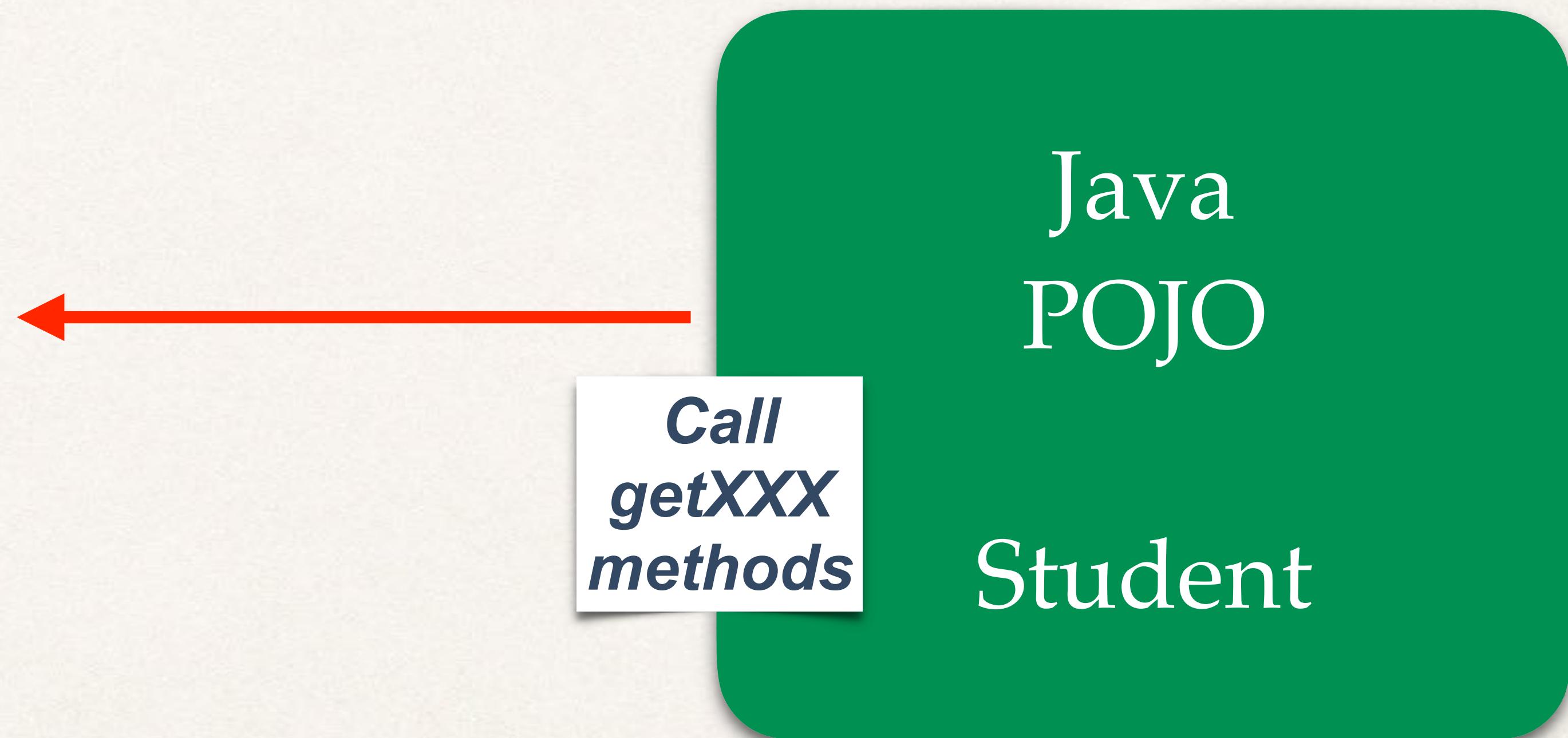
Java
POJO

Student

Java POJO to JSON

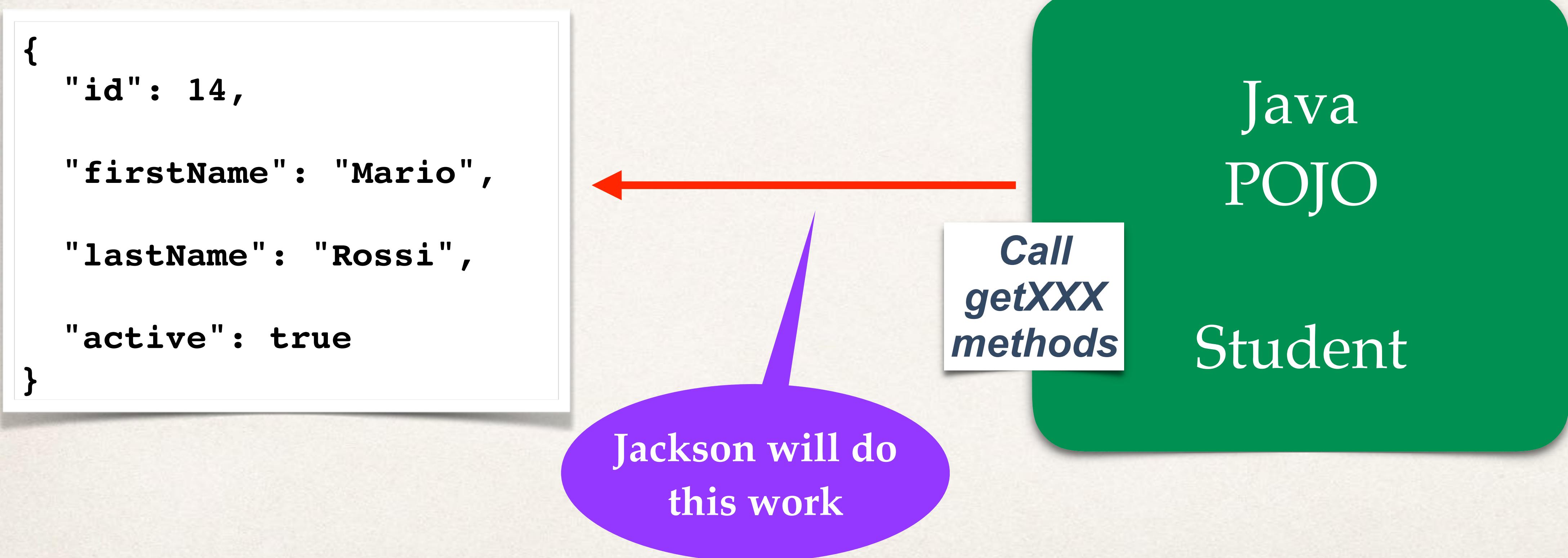
- Now, let's go the other direction
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```
{  
    "id": 14,  
  
    "firstName": "Mario",  
  
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}
```



Java POJO to JSON

- Now, let's go the other direction
- Convert Java POJO to JSON ... call getter methods on POJO



Java POJO to JSON

Java POJO to JSON

```
// create object mapper
ObjectMapper mapper = new ObjectMapper();

// read JSON from file and map/convert to Java POJO
Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);
...
```

Java POJO to JSON

```
// create object mapper
ObjectMapper mapper = new ObjectMapper();

// read JSON from file and map/convert to Java POJO
Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);
...

// now write JSON to output file
mapper.enable(SerializationFeature.INDENT_OUTPUT);
```

Java POJO to JSON

```
// create object mapper
ObjectMapper mapper = new ObjectMapper();

// read JSON from file and map/convert to Java POJO
Student myStudent = mapper.readValue(new File("data/sample...
...

// now write JSON to output file
mapper.enable(SerializationFeature.INDENT_OUTPUT);
```

Indent the JSON output for
"pretty printing"

Java POJO to JSON

```
// create object mapper
ObjectMapper mapper = new ObjectMapper();

// read JSON from file and map/convert to Java POJO
Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);
...

// now write JSON to output file
mapper.enable(SerializationFeature.INDENT_OUTPUT);
mapper.writeValue(new File("data/output.json"), myStudent);
```

Java POJO to JSON

```
// create object mapper
ObjectMapper mapper = new ObjectMapper();

// read JSON from file and map/convert to Java POJO
Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);
...

// now write JSON to output file
mapper.enable(SerializationFeature.INDENT_OUTPUT);
mapper.writeValue(new File("data/output.json"), myStudent);
```

Jackson calls the getter methods on
Student POJO
to create JSON output file

Java POJO to JSON

```
// create object mapper
ObjectMapper mapper = new ObjectMapper();

// read JSON from file and map/convert to Java POJO
Student myStudent = mapper.readValue(new File("data/sample.json"), Student.class);
...

// now write JSON to output file
mapper.enable(SerializationFeature.INDENT_OUTPUT);
mapper.writeValue(new File("data/output.json"), myStudent);
```

Jackson calls the getter methods on
Student POJO
to create JSON output file

File: data/output.json

```
{
  "id": 14,
  "firstName": "Mario",
  "lastName": "Rossi",
  "active": true
}
```

Spring and Jackson Support

Spring and Jackson Support

- When building Spring REST applications

Spring and Jackson Support

- When building Spring REST applications
- Spring will automatically handle Jackson Integration

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Happens
automatically
behind the scenes