

Mobile Application Development

Higher Diploma in Science in Computer Science

Produced
by

Eamonn de Leastar (edeleastar@wit.ie)

Department of Computing, Maths & Physics
Waterford Institute of Technology

<http://www.wit.ie>

<http://elearning.wit.ie>



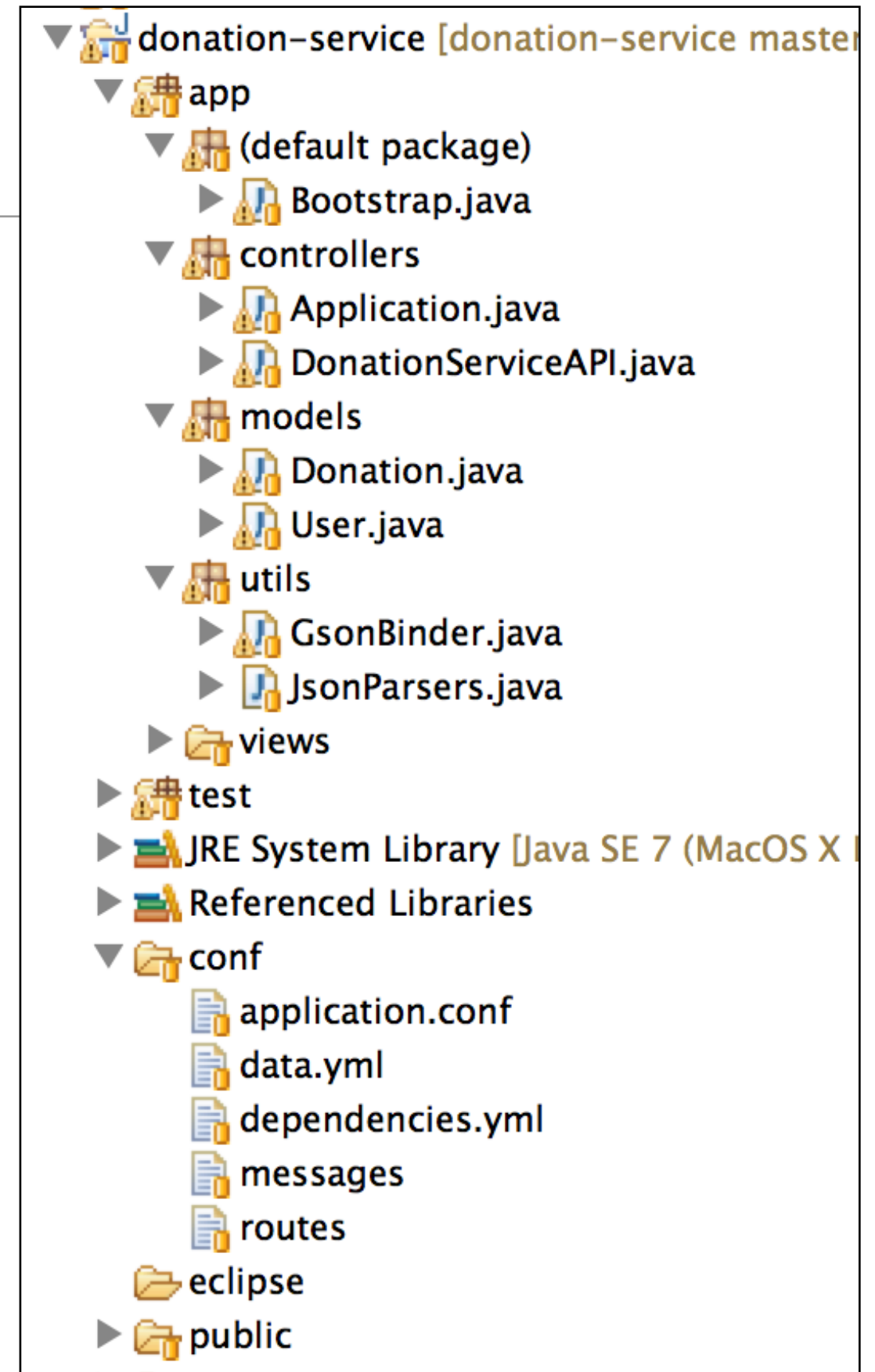
Waterford Institute of Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE



Android <-> Play (1) - Play

donation-service Play App

- Rebuild simpler version of the donation play app:
 - No User Interface
 - No JPA relationships (OneToMany)
- Includes:
 - Converters from Json to User/Donation and back



Models

```
@Entity
public class Donation extends Model
{
    public int    amount;
    public String method;

    public Donation (int amount, String method)
    {
        this.amount = amount;
        this.method = method;
    }

    public String toString()
    {
        return amount + ", " + method;
    }
}
```

```
@Entity
public class User extends Model
{
    public String firstName;
    public String lastName;
    public String email;
    public String password;

    public User(String firstName, String lastName,
                String email, String password)
    {
        this.firstName = firstName;
        this.lastName = lastName;
        this.email = email;
        this.password = password;
    }
}
```

Utils

```
@Global
public class GsonBinder implements TypeBinder<JsonElement>
{
    public Object bind(String name, Annotation[] notes, String value, Class toClass, Type toType) throws Exception
    {
        return new JsonParser().parse(value);
    }
}
```

- Utility class to enable controller actions to acquire Json objects.

JSON

<http://en.wikipedia.org/wiki/JSON>

JSON ([*/ˈdʒeɪsən/*](#) ***jay**-sawn*, [*/ˈdʒeɪsən/*](#) ***jay**-sun*), or **JavaScript Object Notation**, is a text-based [open standard](#) designed for [human-readable](#) data interchange. Derived from the [JavaScript](#) scripting language, JSON is a language for representing simple [data structures](#) and [associative arrays](#), called objects. Despite its relationship to JavaScript, JSON is [language-independent](#), with parsers available for many languages.

The JSON format was originally specified by [Douglas Crockford](#), and is described in [RFC 4627](#). The official [Internet media type](#) for JSON is `application/json`. The JSON filename extension is `.json`.

The JSON format is often used for [serializing](#) and transmitting structured data over a network connection. It is used primarily to transmit data between a server and web application, serving as an alternative to [XML](#).

```
{
  "name": "mocha",
  "shop": "costa",
  "rating": 3.5,
  "price": 2.0,
  "favourite": 0,
  "id": 1
},
{
  "name": "americano",
  "shop": "costa",
  "rating": 4.5,
  "price": 3.0,
  "favourite": 1,
  "id": 2
},
{
  "name": "cappuccino lite",
  "shop": "starbucks",
  "rating": 1.5,
  "price": 4.0,
  "favourite": 1,
  "id": 3
}
```

utils

- Convert Model objects to/from Json
- Include support for list of Model objects

```
public class JsonParsers
{
    static Gson gson = new Gson();

    public static User json2User(String json)
    {
        return gson.fromJson(json, User.class);
    }

    public static List<User> json2Users(String json)
    {
        Type collectionType = new TypeToken<List<User>>() {}.getType();
        return gson.fromJson(json, collectionType);
    }

    public static String user2Json(Object obj)
    {
        return gson.toJson(obj);
    }

    public static Donation json2Donation(String json)
    {
        return gson.fromJson(json, Donation.class);
    }

    public static String donation2Json(Object obj)
    {
        return gson.toJson(obj);
    }

    public static List<Donation> json2Donations(String json)
    {
        Type collectionType = new TypeToken<List<Donation>>() {}.getType();
        return gson.fromJson(json, collectionType);
    }
}
```

controllers

- Actions do not render any views
- Use 'renderJSON' to return json version of model objects
- Other responses include 'notFound' and 'Ok'- which are HTTP response codes

```
public class DonationServiceAPI extends Controller
{
    public static void users()
    {
        List<User> users = User.findAll();
        renderJSON(JsonParsers.user2Json(users));
    }

    public static void user(Long id)
    {
        User user = User.findById(id);
        if (user == null)
        {
            notFound();
        }
        else
        {
            renderJSON(JsonParsers.user2Json(user));
        }
    }

    public static void createUser(JsonElement body)
    {
        User user = JsonParsers.json2User(body.toString());
        user.save();
        renderJSON(JsonParsers.user2Json(user));
    }

    public static void deleteUser(Long id)
    {
        User user = User.findById(id);
        if (user == null)
        {
            notFound();
        }
        else
        {
            user.delete();
            renderText("success");
        }
    }
    //...
}
```


controllers

```
public class DonationServiceAPI extends Controller
{
    //...

    public static void donations()
    {
        List<Donation> donations = Donation.findAll();
        renderText(JsonParsers.donation2Json(donations));
    }

    public static void donation (Long id)
    {
        Donation donation = Donation.findById(id);
        renderJSON (JsonParsers.donation2Json(donation));
    }

    public static void createDonation(JsonElement body)
    {
        Donation donation = JsonParsers.json2Donation(body.toString());
        Donation newDonation = new Donation (donation.amount, donation.method);
        newDonation.save();
        renderJSON (JsonParsers.donation2Json(newDonation));
    }

    public static void deleteDonation(Long id)
    {
        Donation donation = Donation.findById(id);
        if (donation == null)
        {
            notFound();
        }
        else
        {
            donation.delete();
            ok();
        }
    }
}
```

Bootstrap

```
@OnApplicationStart
public class Bootstrap extends Job
{
    public void doJob()
    {
        if (User.count() == 0)
        {
            Fixtures.deleteDatabase();
            Fixtures.loadModels("data.yml");
        }
    }
}
```

```
User(homer):
  usaCitizen: true
  firstName: Homer
  lastName: Simpson
  email: homer@simpson.com
  password: secret
```

```
User(marge):
  usaCitizen: true
  firstName: Marge
  lastName: Simpson
  email: marge@simpson.com
  password: secret
```

```
User(lisa):
  usaCitizen: true
  firstName: Lisa
  lastName: Simpson
  email: lisa@simpson.com
  password: secret
```

```
User(bart):
  usaCitizen: true
  firstName: Bart
  lastName: Simpson
  email: bart@simpson.com
  password: secret
```

```
User(maggie):
  usaCitizen: true
  firstName: Maggie
  lastName: Simpson
  email: maggie@simpson.com
  password: secret
```

```
Donation(a):
  amount : 210
  method : paypal
```

```
Donation(b):
  amount : 20
  method : cash
```

```
Donation(c):
  amount : 330
  method : cash
```

Routes

GET	/api/users	DonationServiceAPI.users
GET	/api/users/{id}	DonationServiceAPI.user
POST	/api/users	DonationServiceAPI.createUser
DELETE	/api/users/{id}	DonationServiceAPI.deleteUser
GET	/api/donations	DonationServiceAPI.donations
GET	/api/donations/{id}	DonationServiceAPI.donation
POST	/api/donations	DonationServiceAPI.createDonation
DELETE	/api/donations/{id}	DonationServiceAPI.deleteDonation

- Donation Service API
- Client application use these patterns to communicate with service

Your application is ready ! x

localhost:9000

☆ ⌚ 💬 ☰

Your new application is ready!

Congratulation, you've just created a new play application. This page will help you in the few next steps.

Why do you see this page?

The **conf/routes** file defines a route that tell play to invoke the **Application.index** action when a browser requests the / URI using the **GET** method:

```
# Application home page
GET      /           Application.index
```

So play has invoked the **controllers.Application.index()** method:

```
public static void index() {
    render();
}
```

Using the **render()** call, this action asks play to display a template. By convention play has displayed the **app/views/Application/index.html** template:

```
{extends 'main.html' /}
{set title:'Home' /}
```

Play!

Play 1.2.7

Browse

- [Local documentation](#)
- [Browse Java API](#)

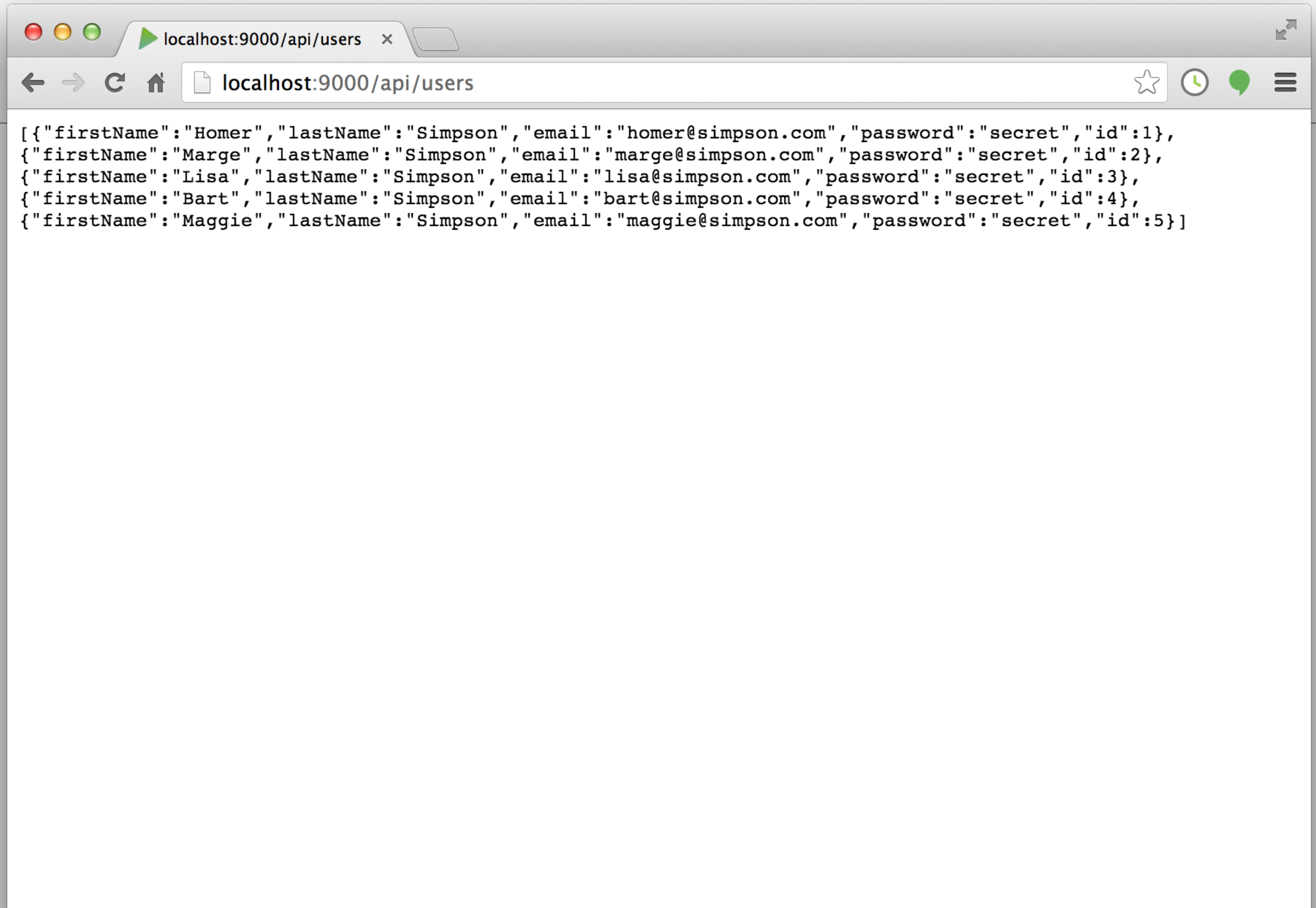
Contents

- [Why do you see this page?](#)
- [Need to set up a Java IDE?](#)
- [Need to connect to a database?](#)
- [Need more help?](#)

Search

Get help with google

Google™ Custom Search



localhost:9000/api/users x view-source:localhost:9000/api/users

view-source:localhost:9000/api/users

1 [{"firstName":"Homer","lastName":"Simpson","email":"homer@simpson.com","password":"secret","id":1}, {"firstName":"Marge","lastName":"Simpson","email":"marge@simpson.com","password":"secret","id":2}, {"firstName":"Lisa","lastName":"Simpson","email":"lisa@simpson.com","password":"secret","id":3}, {"firstName":"Bart","lastName":"Simpson","email":"bart@simpson.com","password":"secret","id":4}, {"firstName":"Maggie","lastName":"Simpson","email":"maggie@simpson.com","password":"secret","id":5}]

Elements Resources Network Sources Timeline Profiles Audits Console

<html>

<body>

<div class="webkit-line-gutter-backdrop"></div>

<table>

<tbody>

<tr>

<td class="webkit-line-number" value="1"></td>

<td class="webkit-line-content">["{firstName: 'Homer', lastName: 'Simpson', email: 'homer@simpson.com', password: 'secret', id: 1}, {firstName: 'Marge', lastName: 'Simpson', email: 'marge@simpson.com', password: 'secret', id: 2}, {firstName: 'Lisa', lastName: 'Simpson', email: 'lisa@simpson.com', password: 'secret', id: 3}, {firstName: 'Bart', lastName: 'Simpson', email: 'bart@simpson.com', password: 'secret', id: 4}, {firstName: 'Maggie', lastName: 'Simpson', email: 'maggie@simpson.com', password: 'secret', id: 5}"]</td></tr></tbody></table></body></html>

StylesComputed >>

element.style {
}

body { user agent stylesheet
display: block;
margin: 8px;
}

marginborderpadding994 x 197

htmlbodytabletbodytrtd.webkit-line-content(text)

localhost:9000/api/users x view-source:localhost:9000 x

view-source:localhost:9000/api/donations

1 [{ "amount": 210, "method": "paypal", "id": 1 }, { "amount": 20, "method": "cash", "id": 2 }, { "amount": 330, "method": "cash", "id": 3 }, { "amount": 10, "method": "paypal", "id": 4 }]

Elements Resources Network Sources Timeline Profiles Audits Console

<html>

<body>

<div class="webkit-line-gutter-backdrop"></div>

<table>

<tbody>

<tr>

<td class="webkit-line-number" value="1"></td>

<td class="webkit-line-content">["[{ "amount": 210, "method": "paypal", "id": 1 }, { "amount": 20, "method": "cash", "id": 2 }, { "amount": 330, "method": "cash", "id": 3 }, { "amount": 10, "method": "paypal", "id": 4 }]]</td></tr></tbody></table></div></body></html>

StylesComputed >>

element.style {

+⌵⚙

td, th { user agent stylesheetdisplay: table-cell;vertical-align: inherit;

Inherited from tabletable { user agent stylesheetwhite-space: normal;line-height: normal;font-weight: normal;font-size: medium;font-variant: normal;font-style: normal;color: -webkit-text;text-align: start;

table { user agent stylesheetborder-collapse: separate;

htmlbodytabletbodytrtd.webkit-line-content

localhost:9000/api/users

view-source:localhost:9000

view-source:localhost:9000/api/users/1

1

{"firstName":"Homer","lastName":"Simpson","email":"homer@simpson.com","password":"secret","id":1}

ElementsResourcesNetworkSourcesTimelineProfilesAuditsConsole

<html>

<body>

<div class="webkit-line-gutter-backdrop"></div>

<table>

<tbody>

<tr>

<td class="webkit-line-number" value="1"></td>

<td class="webkit-line-content">

"{"firstName":"Homer","lastName":"Simpson","email":"homer@simpson.com","password":"secret","id":1}"

</td></tr></tbody></table></div></body></html>

StylesComputed »

element.style {

+⌵⚙

td, th { user agent stylesheet

display: table-cell;vertical-align: inherit;

Inherited from table

table { user agent stylesheet

white-space: normal;line-height: normal;font-weight: normal;font-size: medium;font-variant: normal;font-style: normal;color: -webkit-text;text-align: start;

table { user agent stylesheet

border-collapse: separate;

htmlbodytabletbodytrtd.webkit-line-content

⌵⌵🔍

History

Collections

**POST** http://localhost:9000/api/users

Normal

Basic Auth

Digest Auth

OAuth 1.0


OAuth 2.0



No environment ▼

http://localhost:9000/api/users

POST

 URL params Headers (1)

Content-Type

application/json



Header

Value

Add preset ▼

Manage presets

form-data

x-www-form-urlencoded

raw

binary

JSON (application/json) ▼

```
1 {  
2   "lastName" : "simpson",  
3   "firstName" : "homer"  
4 }
```

Send ▼

Preview

Add to collection

Reset

Type to filter

Body

Headers (5)

STATUS 200 OK

TIME 75 ms

POSTMANAPI DirectoryEamonn de LeastarSupportors

HistoryCollections

POSThttp://localhost:9000/api/users

POSThttp://localhost:9000/api/users

POSThttp://localhost:9000/api/users

POSThttp://localhost:9000/api/users

POSThttp://localhost:9000/api/users

http://localhost:9000/api/usersPOSTURL paramsHeaders (1)

Content-Typeapplication/json

Header	Value
--------	-------

Add presetManage presets

form-datax-www-form-urlencodedrawbinaryJSON (application/json)

1 {

2 "lastName" : "simpson",

3 "firstName" : "homer"

4 }

SendPreviewAdd to collectionReset

BodyHeaders (5)STATUS 200 OKTIME 27 ms

PrettyRawPreviewJSONXMLCopy

1 {

2 "firstName": "homer",

3 "lastName": "simpson",

4 "id": 11

5 }

Type to filter

HTTP request

Curl

Limitations

POST /api/users HTTP/1.1

Host: localhost:9000

Content-Type: application/json

```
{ "lastName": "simpson", "firstName": "homer" }
```

Send



Build

Add to collection

Reset

Body

Headers (5)

STATUS 200 OK

TIME 25 ms

Pretty

Raw

Preview

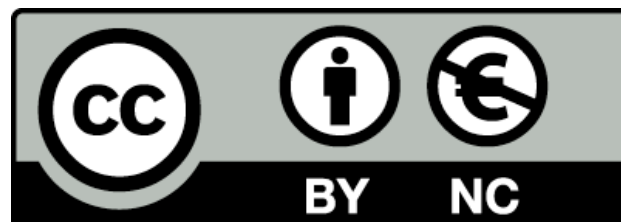


JSON

XML

Copy

```
1 {  
2   "firstName": "homer",  
3   "lastName": "simpson",  
4   "id": 12  
5 }
```



Except where otherwise noted, this content is licensed under a Creative Commons Attribution-NonCommercial 3.0 License.

For more information, please see <http://creativecommons.org/licenses/by-nc/3.0/>



Waterford Institute of Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

