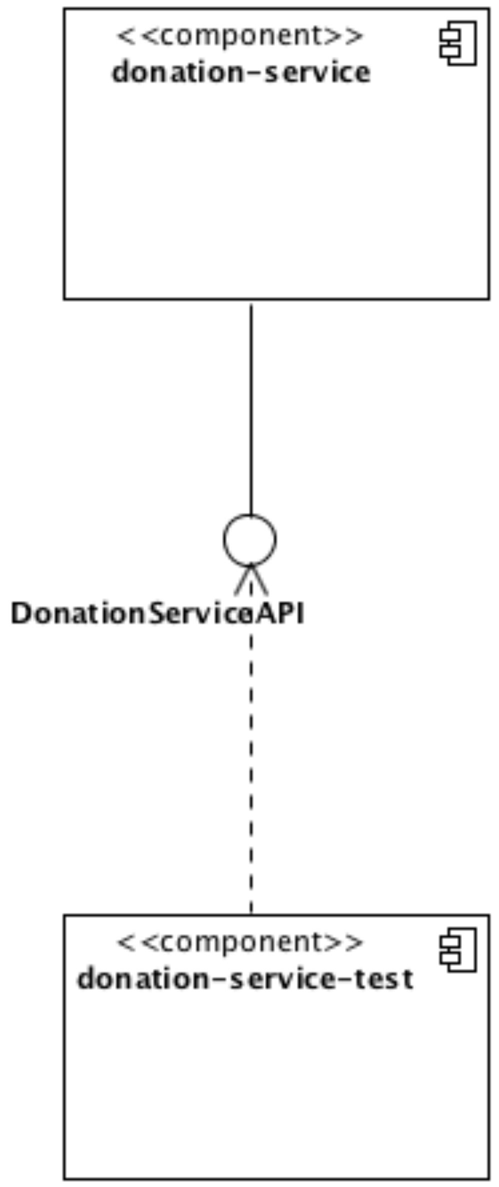
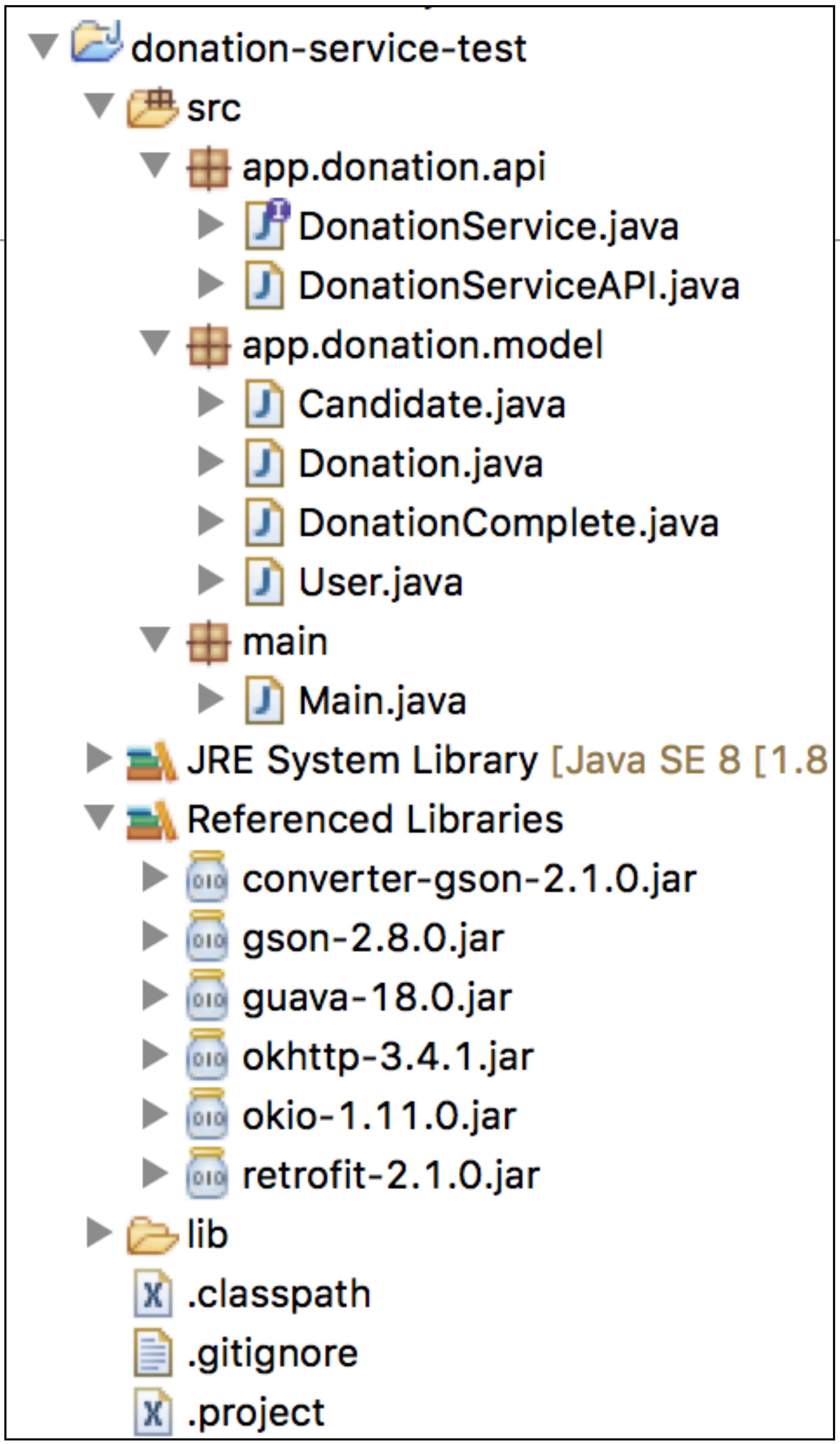
donation-service-test

donation-service-test





```
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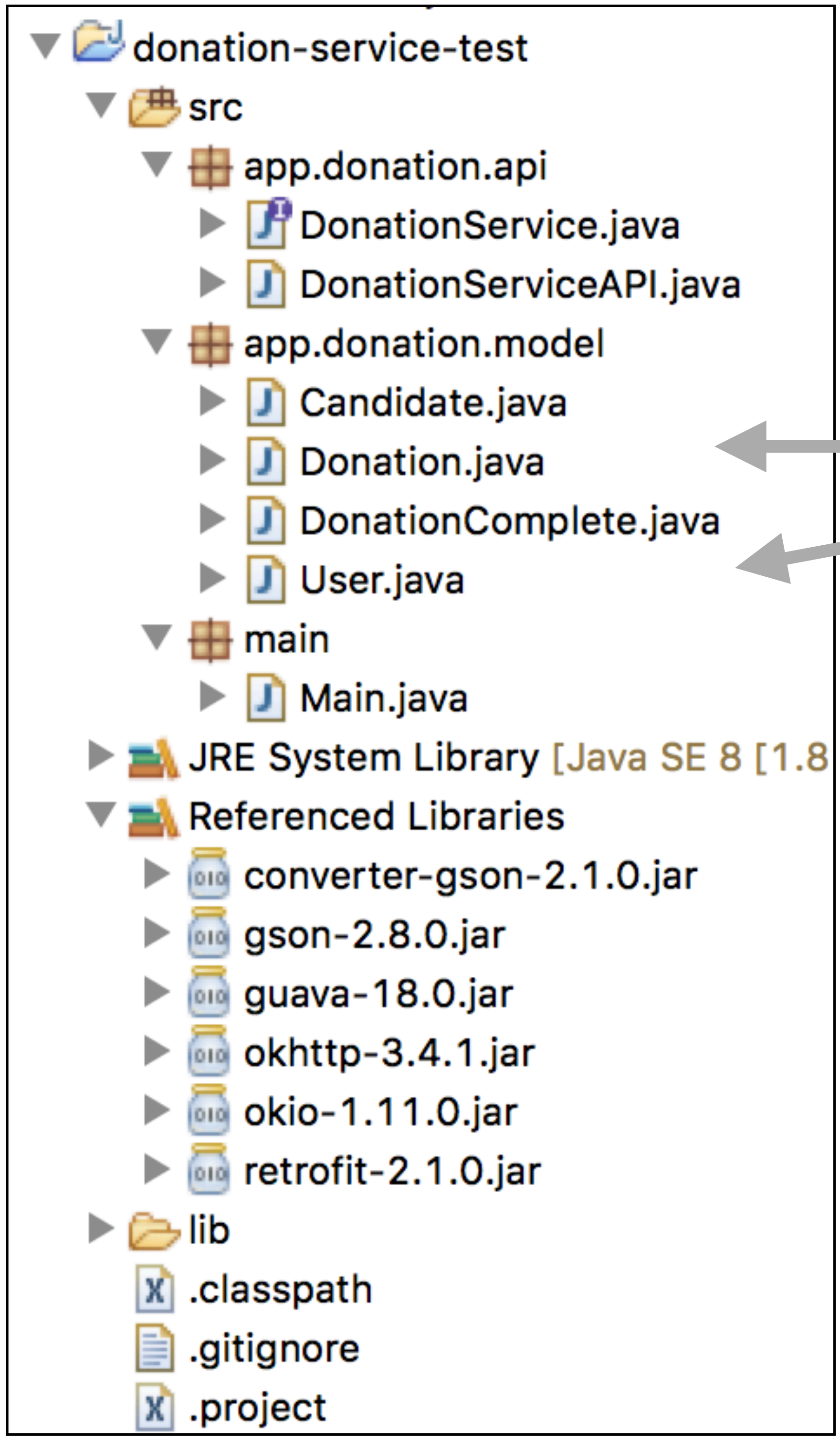
  ▼ src
    ▼ app.donation.api
      ▶ DonationService.java
      ▶ DonationServiceAPI.java
    ▼ app.donation.model
      ▶ Candidate.java
      ▶ Donation.java
      ▶ DonationComplete.java
      ▶ User.java
    ▼ main
      ▶ Main.java
  ▶ JRE System Library [Java SE 8 [1.8
  ▼ Referenced Libraries
    ▶ converter-gson-2.1.0.jar
    ▶ gson-2.8.0.jar
    ▶ guava-18.0.jar
    ▶ okhttp-3.4.1.jar
    ▶ okio-1.11.0.jar
    ▶ retrofit-2.1.0.jar
  ▶ lib
    .classpath
    .gitignore
    .project
```

Donation Models



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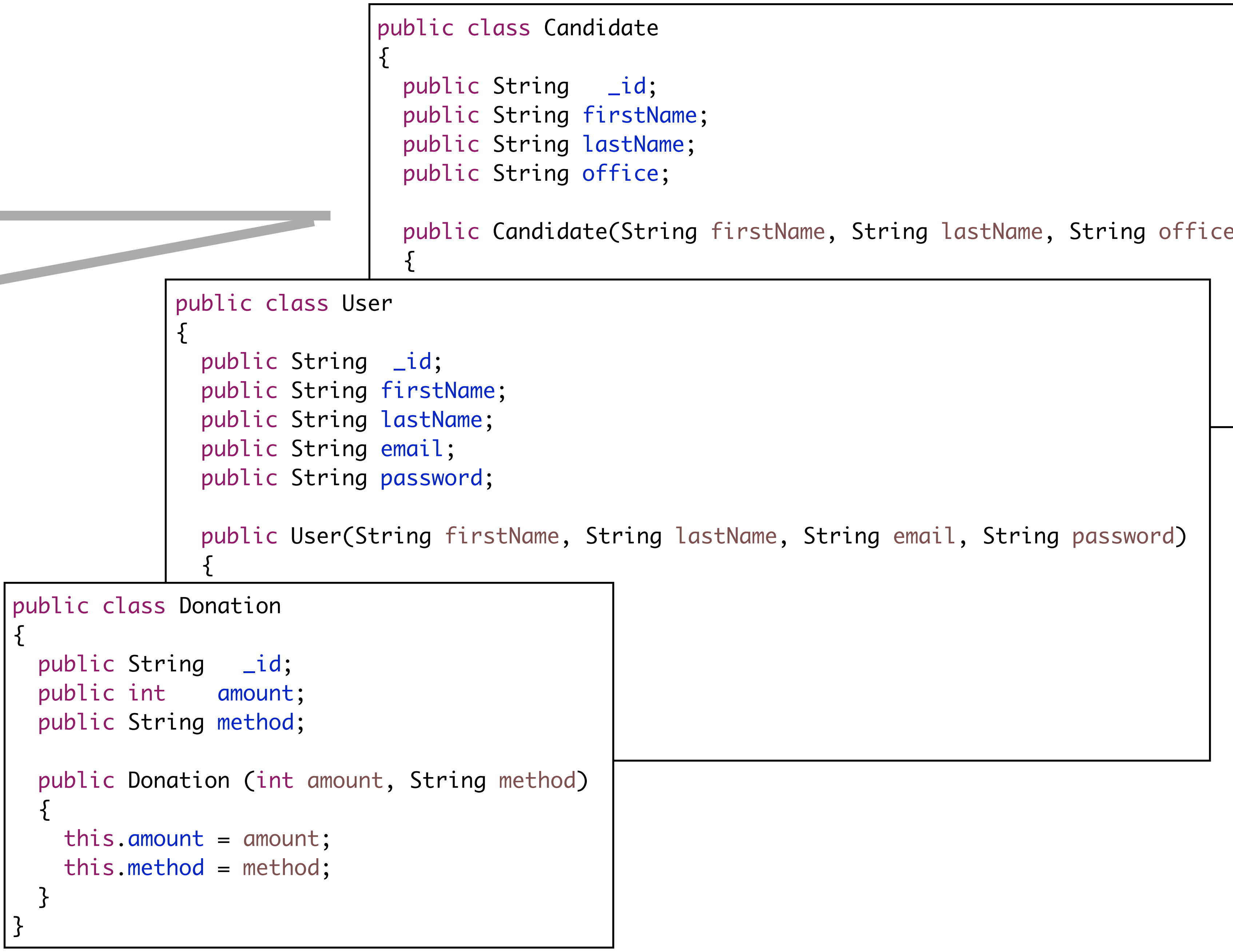
  ▶ lib
    .classpath
    .gitignore
    .project
```

- Java versions of Mongoose models



```
public class Candidate
{
  public String   _id;
  public String firstName;
  public String lastName;
  public String office;

  public Candidate(String firstName, String lastName, String office
  {
```

```
public class User
{
  public String  _id;
  public String firstName;
  public String lastName;
  public String email;
  public String password;

  public User(String firstName, String lastName, String email, String password)
  {
```

```
public class Donation
{
  public String   _id;
  public int     amount;
  public String method;

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

Javascript Mongoose vs Java Models

Javascript

```javascript
const candidateSchema = mongoose.Schema({
  firstName: String,
  lastName: String,
  office: String,
});
```

```javascript
const donationSchema = mongoose.Schema({
  amount: Number,
  method: String,
  donor: {
    type: mongoose.Schema.Types.ObjectId,
    ref: 'User',
  },
  candidate:  {
    type: mongoose.Schema.Types.ObjectId,
    ref: 'Candidate',
  },
});
```

Java

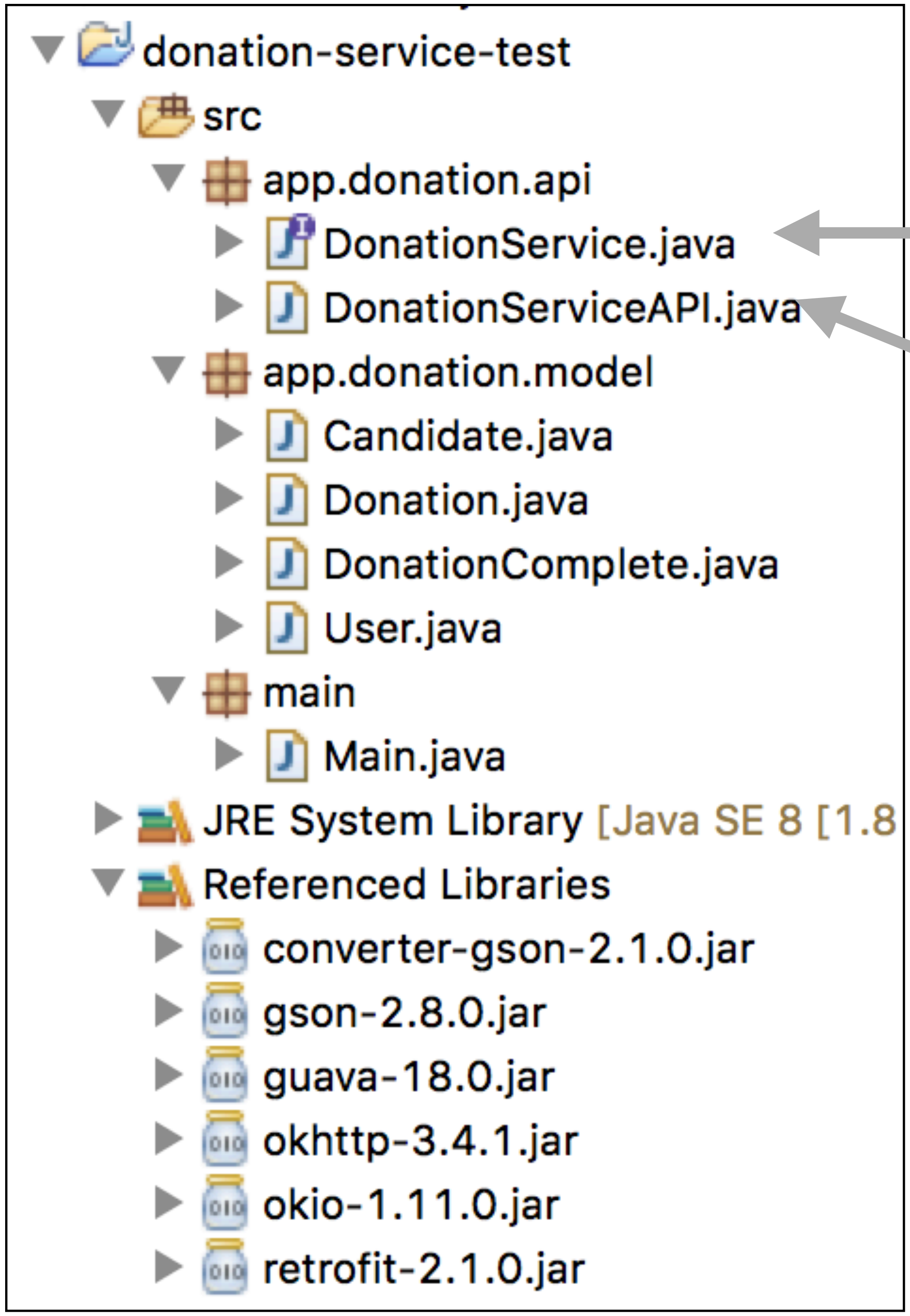
```java
public class Candidate
{
  public String   _id;
  public String firstName;
  public String lastName;
  public String office;

  public Candidate(String firstName, String lastName, String office)
  {
    this.firstName = firstName;
    this.lastName = lastName;
    this.office = office;
  }
}
```

```java
public class Donation
{
  public String   _id;
  public int      amount;
  public String method;

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

Donation API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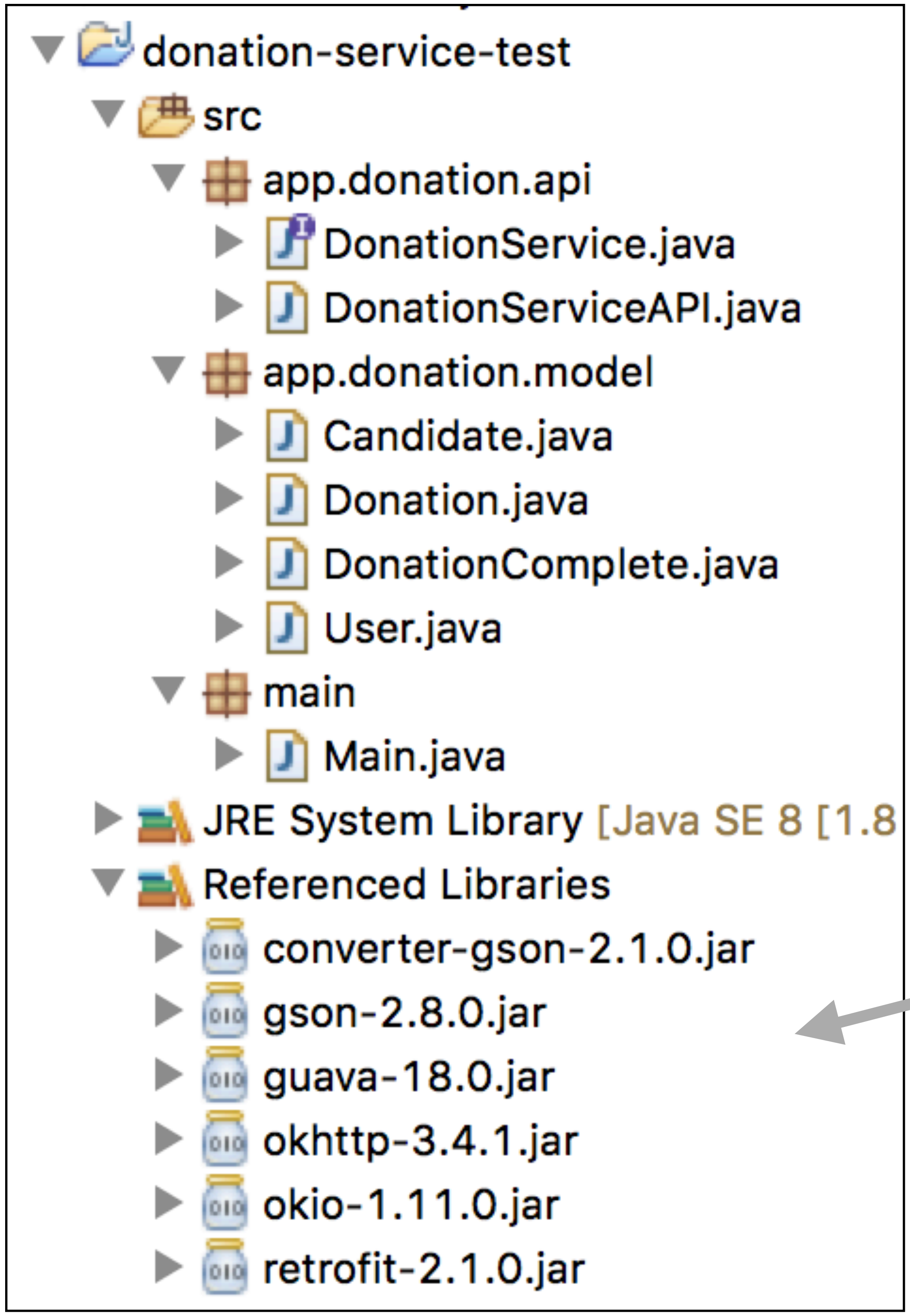
    ▶ retrofit-2.1.0.jar
```

- Java Wrappers to deliver a client side API.
- These class will be responsible for composing the HTTP Requests and sending them to donation-web

Donation API



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    ▶ retrofit-2.1.0.jar
```
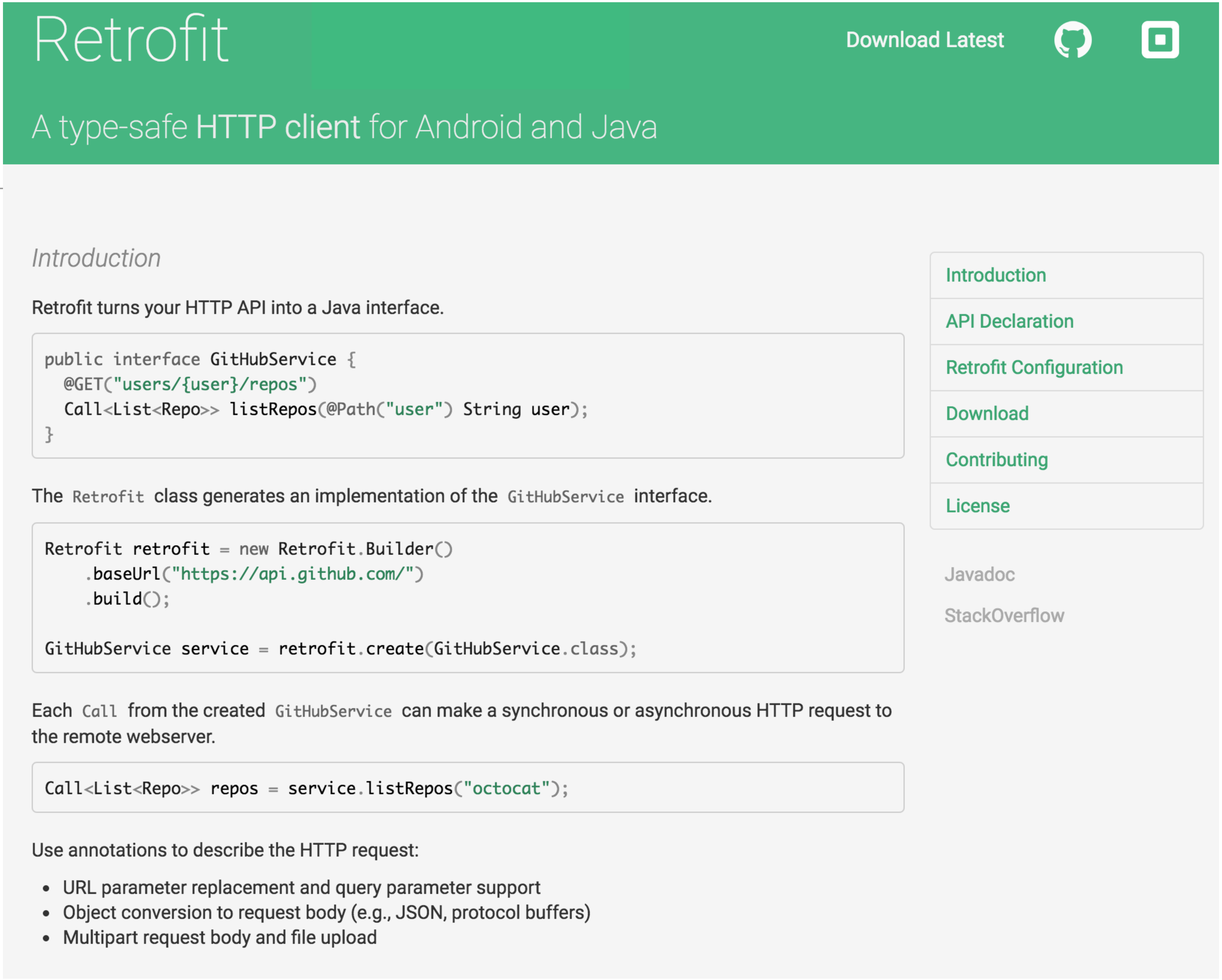

- Retofit Libraries to simplify Rest API development in Java


Retrofit

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A type-safe **HTTP client** for Android and Java

Introduction

Retrofit turns your HTTP API into a Java interface.

```
public interface GitHubService {
  @GET("users/{user}/repos")
  Call<List<Repo>> listRepos(@Path("user") String user);
}
```

The `Retrofit` class generates an implementation of the `GitHubService` interface.

```
Retrofit retrofit = new Retrofit.Builder()
    .baseUrl("https://api.github.com/")
    .build();

GitHubService service = retrofit.create(GitHubService.class);
```

Each `Call` from the created `GitHubService` can make a synchronous or asynchronous HTTP request to the remote webserver.

```
Call<List<Repo>> repos = service.listRepos("octocat");
```

Use annotations to describe the HTTP request:

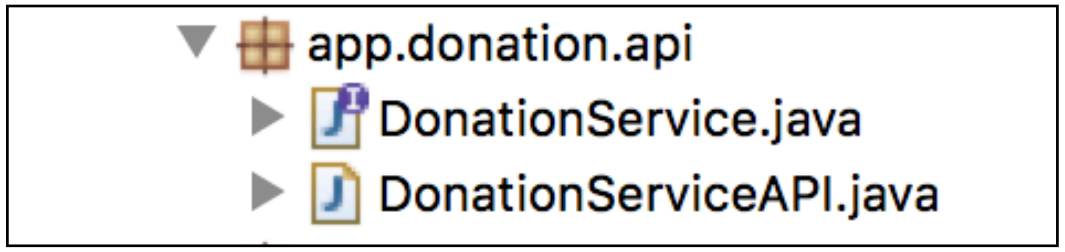
- URL parameter replacement and query parameter support
- Object conversion to request body (e.g., JSON, protocol buffers)
- Multipart request body and file upload

Introduction
API Declaration
Retrofit Configuration
Download
Contributing
License

Javadoc

StackOverflow

DonationService



```
▼ app.donation.api
    ▶ DonationService.java
    ▶ DonationServiceAPI.java
```

- Provides convenient access in a client to a remote service

```
public interface DonationService
{
  @GET("/api/users")
  Call<List<User>> getAllUsers();

  @GET("/api/users/{id}")
  Call<User> getUser(@Path("id") String id);

  @POST("/api/users")
  Call<User> createUser(@Body User User);

  @GET("/api/donations")
  Call<List<Donation>> getAllDonations();

  @GET("/api/candidates")
  Call<List<Candidate>> getAllCandidates();

  @POST("/api/candidates/{id}/donations")
  Call<Donation> createDonation(@Path("id") String id, @Body Donation donation);
}
```

```
module.exports = [
  { method: 'GET', path: '/api/users', config: UsersApi.find },
  { method: 'GET', path: '/api/users/{id}', config: UsersApi.findOne },
  { method: 'POST', path: '/api/users', config: UsersApi.create },
  { method: 'GET', path: '/api/donations', config: DonationsApi.findAllDonations },
  { method: 'GET', path: '/api/candidates', config: CandidatesApi.find },
  { method: 'GET', path: '/api/candidates/{id}/donations', config: DonationsApi.findDonations },
];
```

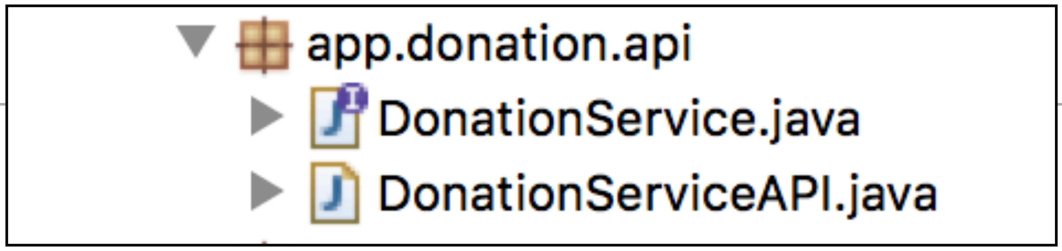
Creating the Client Service Object

- 'service' created using the Gson JSON library
- This object can be used to invoke REST API directly in java

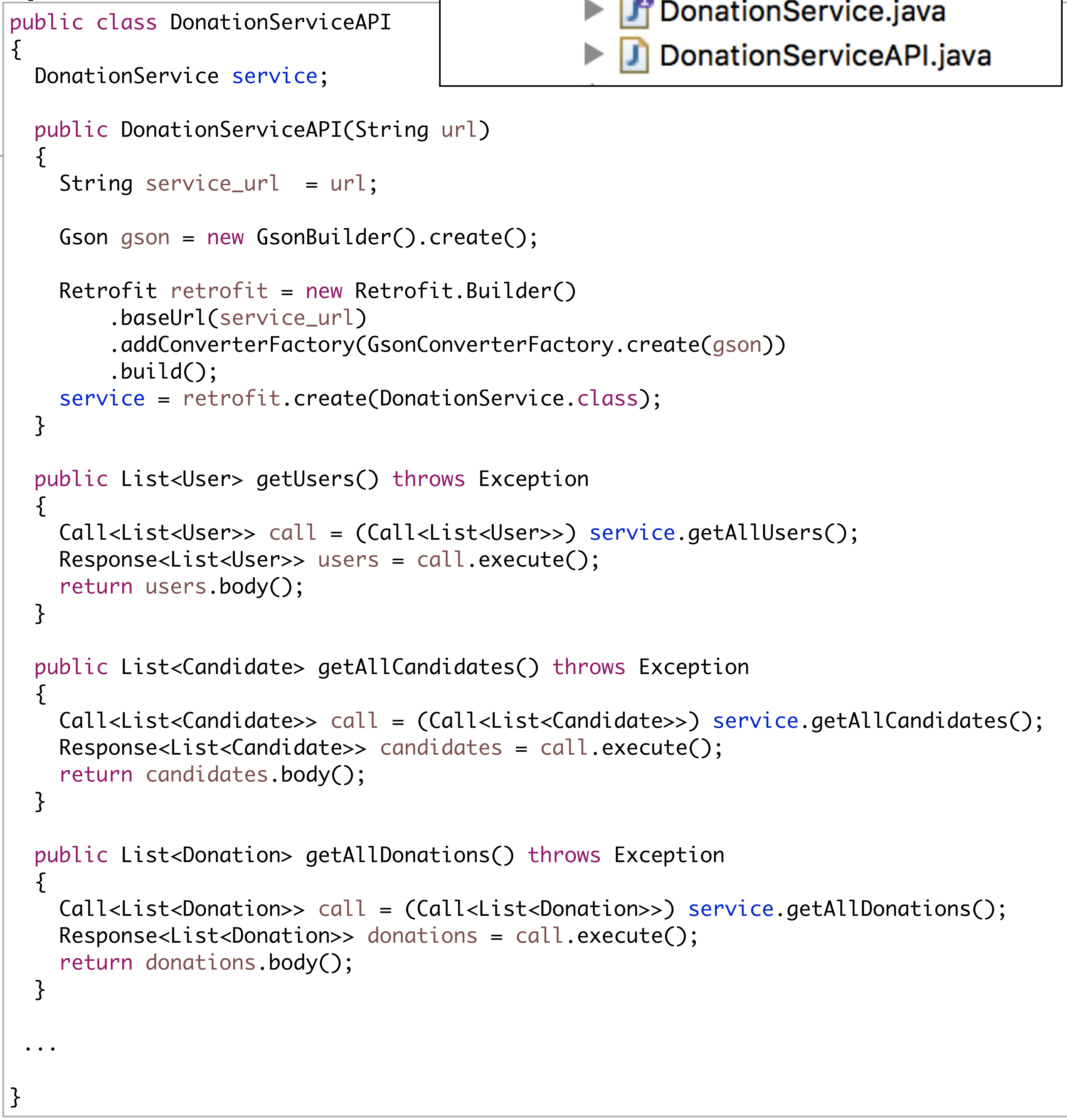
```
public class DonationServiceAPI
{
  DonationService service;

  public DonationServiceAPI(String url)
  {
    String service_url  = url;

    Gson gson = new GsonBuilder().create();

    Retrofit retrofit = new Retrofit.Builder()
        .baseUrl(service_url)
        .addConverterFactory(GsonConverterFactory.create(gson))
        .build();
    service = retrofit.create(DonationService.class);
  }

 ...

}
```

DonationServiceAPI

- Assemble & a HTTP request
- Translate any data from Java to JSON format
- Dispatch the request
- Wait for the response
- Translate response from JSON to Java

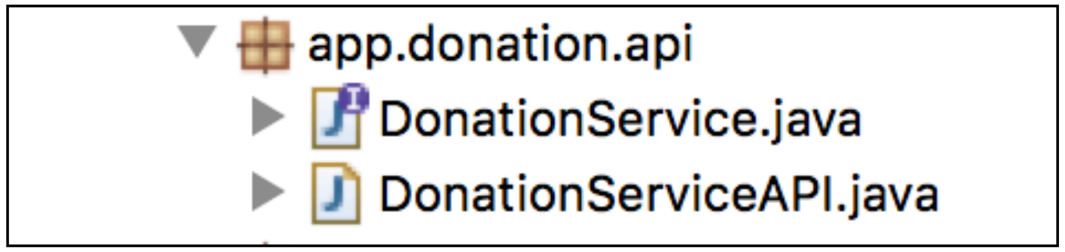


```
▼ app.donation.api
  ▶ DonationService.java
  ▶ DonationServiceAPI.java
```



```java
public class DonationServiceAPI
{
  DonationService service;

  public DonationServiceAPI(String url)
  {
    String service_url  = url;

    Gson gson = new GsonBuilder().create();

    Retrofit retrofit = new Retrofit.Builder()
        .baseUrl(service_url)
        .addConverterFactory(GsonConverterFactory.create(gson))
        .build();
    service = retrofit.create(DonationService.class);
  }

  public List<User> getUsers() throws Exception
  {
    Call<List<User>> call = (Call<List<User>>) service.getAllUsers();
    Response<List<User>> users = call.execute();
    return users.body();
  }

  public List<Candidate> getAllCandidates() throws Exception
  {
    Call<List<Candidate>> call = (Call<List<Candidate>>) service.getAllCandidates();
    Response<List<Candidate>> candidates = call.execute();
    return candidates.body();
  }

  public List<Donation> getAllDonations() throws Exception
  {
    Call<List<Donation>> call = (Call<List<Donation>>) service.getAllDonations();
    Response<List<Donation>> donations = call.execute();
    return donations.body();
  }

 ...

}
```

DonationServiceAPI



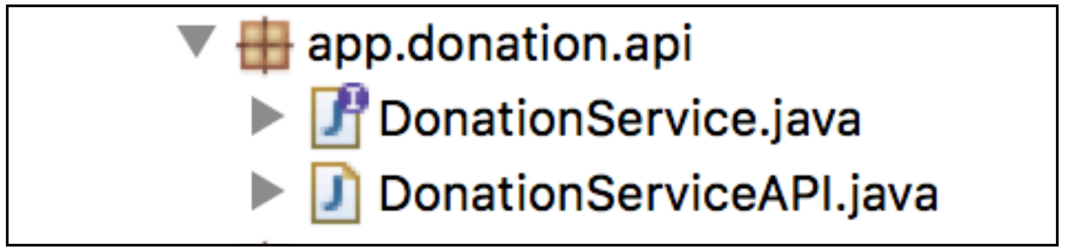
```
app.donation.api
    DonationService.java
    DonationServiceAPI.java
```

```java
public List<Candidate> getAllCandidates() throws Exception
{
  Call<List<Candidate>>
      call = (Call<List<Candidate>>) service.getAllCandidates();
  Response<List<Candidate>> candidates = call.execute();
  return candidates.body();
}
```

```java
public interface DonationService
{
  ...
  @GET("/api/candidates")
  Call<List<Candidate>> getAllCandidates();
  ...
}
```

- Assemble a HTTP request
- Dispatch the request & Wait for the response
- Translate response from JSON to Java

DonationServiceAPI



app.donation.api
DonationService.java
DonationServiceAPI.java

```
public User createUser(User newUser) throws Exception
{
  Call<User> call = (Call<User>) service.createUser(newUser);
  Response<User> returnedUser = call.execute();
  return returnedUser.body();
}
```

```
public interface DonationService
{
  ...

  @POST("/api/users")
  Call<User> createUser(@Body User User);

  ...
}
```

Using the API

```
DonationServiceAPI service = new DonationServiceAPI("http://localhost:4000");
List<Candidate> candidates = service.getAllCandidates();
List<User> users = service.getUsers();
List<Donation> donations = service.getAllDonations();
```

- Simple Java API to retrieve
    - Candidates
    - Users
    - Donations
- into local model objects

Rendering Java Objects in console

- Convenient 'prettyprint' of java objects to familiar json notaion

```
static Gson gson = new GsonBuilder().setPrettyPrinting().create();

public static void println(Object o)
{
  System.out.println(gson.toJson(o));
}


...
 List<Donation> donations = service.getAllDonations();
 println(donations);
...
```

```
public class Donation
{
  public String   _id;
  public int     amount;
  public String method;

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

```
[
  {
    "_id": "5815a5b10dc72a79a540cf1d",
    "amount": 40,
    "method": "paypal"
  },
  {
    "_id": "5815a5b10dc72a79a540cf1e",
    "amount": 90,
    "method": "direct"
  },
  {
    "_id": "5815a5b10dc72a79a540cf1f",
    "amount": 430,
    "method": "paypal"
  }
]
```

Object References?

```
const donationSchema = mongoose.Schema({
  amount: Number,
  method: String,
  donor: {
    type: mongoose.Schema.Types.ObjectId,
    ref: 'User',
  },
  candidate:  {
    type: mongoose.Schema.Types.ObjectId,
    ref: 'Candidate',
  },
});
```

```
public class Donation
{
  public String   _id;
  public int     amount;
  public String method;

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

```
[
  {
    "_id": "5815a5b10dc72a79a540cf1d",
    "amount": 40,
    "method": "paypal"
  },
  {
    "_id": "5815a5b10dc72a79a540cf1e",
    "amount": 90,
    "method": "direct"
  },
  {
    "_id": "5815a5b10dc72a79a540cf1f",
    "amount": 430,
    "method": "paypal"
  }
]
```

- Java Version does not include donor & candidate references
- Retofit simply ignore these fields, and generates incomplete Donation objects in Java

Object References - Complete Donation

```
const donationSchema = mongoose.Schema({
  amount: Number,
  method: String,
  donor: {
    type: mongoose.Schema.Types.ObjectId,
    ref: 'User',
  },
  candidate:  {
    type: mongoose.Schema.Types.ObjectId,
    ref: 'Candidate',
  },
});
```

```
public class DonationComplete
{
  public String   _id;
  public int     amount;
  public String method;
  public User donor;
  public Candidate candidate;

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

- Merely by including references to other Java models, retrofit will generate and populate the references in Java objects

```
[
  {
    "_id": "5815a5b10dc72a79a540cf1d",
    "amount": 40,
    "method": "paypal",
    "donor": {
      "_id": "5815a5b00dc72a79a540cf1a",
      "firstName": "Bart",
      "lastName": "Simpson",
      "email": "bart@simpson.com",
      "password": "secret"
    },
    "candidate": {
      "_id": "5815a5b00dc72a79a540cf1b",
      "firstName": "Lisa",
      "lastName": "Simpson",
      "office": "President"
    }
  },
 },
```