Mobile Application Development

Produced by

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eLearning support unit

donation-service-test

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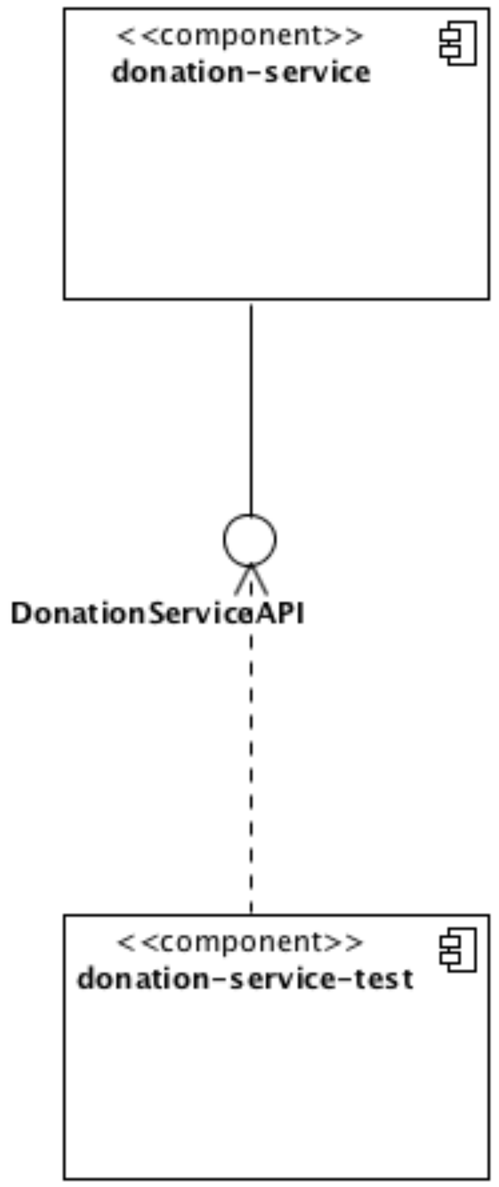
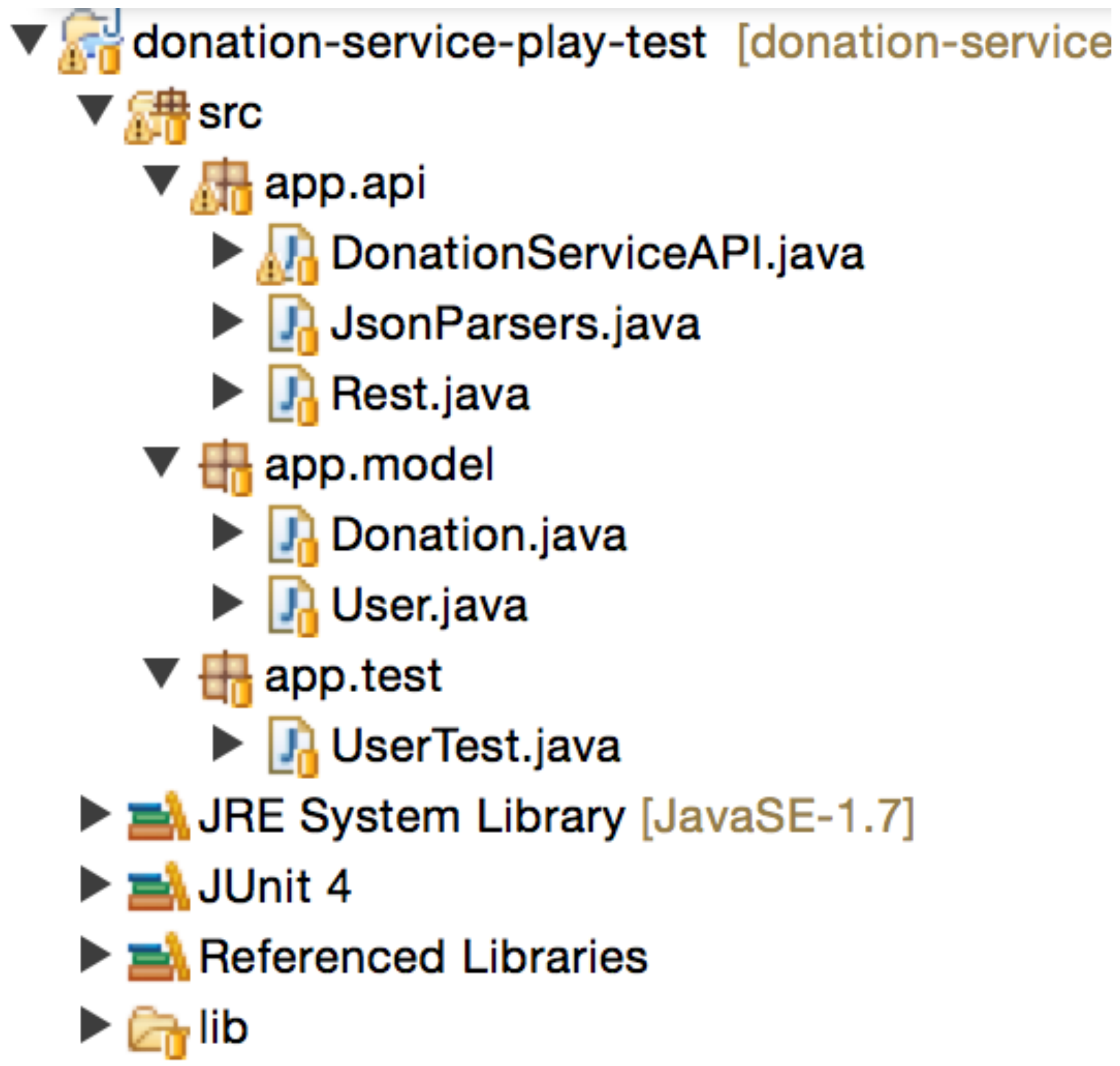
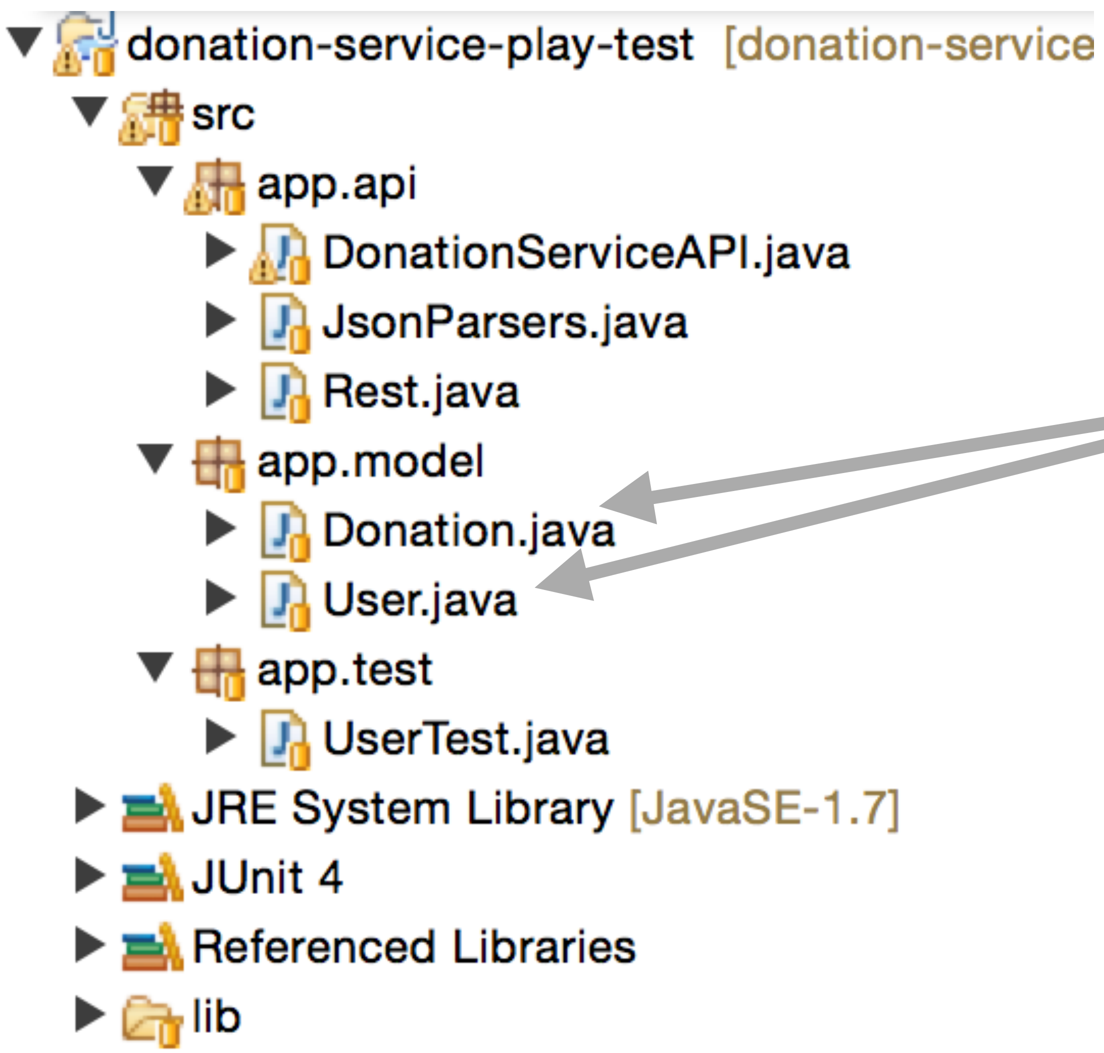




```
▼ donation-service-play-test [donation-service
  ▼ src
    ▼ app.api
      ▶ DonationServiceAPI.java
      ▶ JsonParsers.java
      ▶ Rest.java
    ▼ app.model
      ▶ Donation.java
      ▶ User.java
    ▼ app.test
      ▶ UserTest.java
  ▶ JRE System Library [JavaSE-1.7]
  ▶ JUnit 4
  ▶ Referenced Libraries
  ▶ lib
```

donation-service-test

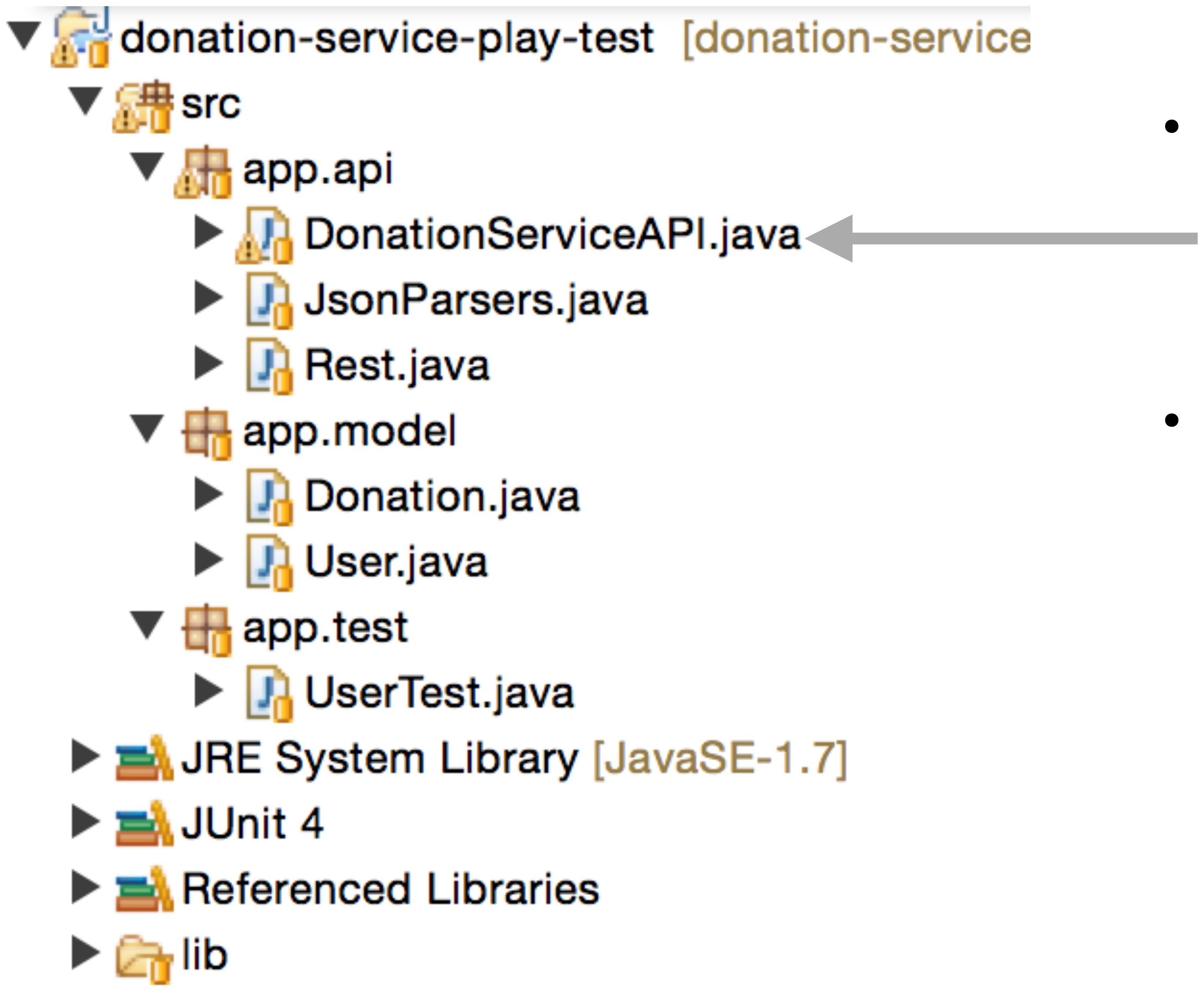


- Adapted from play versions to include equals methods

```
@Override
public boolean equals(final Object obj)
{
  if (obj instanceof User)
  {
    final User other = (User) obj;
    return Objects.equal(firstName,  other.firstName)
        && Objects.equal(lastName,   other.lastName)
        && Objects.equal(email,      other.email)
        && Objects.equal(password,   other.password);
  }
  else
  {
    return false;
  }
}
```

- These utility methods greatly simplify tests

donation-service-test



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- A ‘wrapper’ to deliver a client side API.
- i.e. this class will be responsible for composing the HTTP Requests and sending them to the play service

DonationServiceAPI

- Uses the Rest class + JsonParser to provide convenient, high level interface to donation-service API

```
GET     /api/users
GET     /api/users/{id}
POST    /api/users
DELETE  /api/users/{id}

GET     /api/donations
GET     /api/donations/{id}
POST    /api/donations
DELETE  /api/donations/{id}
```

```
public class DonationServiceAPI
{
  public static List<User> getUsers() throws Exception
  {
    String response =  Rest.get("/api/users");
    List<User> userList = JsonParsers.json2Users(response);
    return userList;
  }

  public static User getUser(Long id) throws Exception
  {
    String response =  Rest.get("/api/users/" + id);
    User user = JsonParsers.json2User(response);
    return user;
  }

  public static User createUser(User user) throws Exception
  {
    String response = Rest.post ("/api/users", JsonParsers.user2Json(user));
    return JsonParsers.json2User(response);
  }

  public static void deleteUser(User user) throws Exception
  {
    Rest.delete ("/api/users/" + user.id);
  }
}
```

Test POST /api/users

```java
public class SimpleUserTest
{
  @Test
  public void testCreate () throws Exception
  {
    User homer = new User ("homer",  "simpson", "homer@simpson.com",  "secret");
    User user  = DonationServiceAPI.createUser(homer);
    assertEquals(homer, user);
    DonationServiceAPI.deleteUser(user);
  }
}
```

- Create a user object locally
- Use this to request a user be created in the donation-service
- Verify that the returned user (from the getUserRequest) contains the same values as the local object we used to create the User
- Clean up by deleting the user (from the service)

Test GET /api/users/{id}

```
@Test
public void testGet () throws Exception
{
  User homer = new User ("homer",  "simpson", "homer@simpson.com",  "secret");
  User user = DonationServiceAPI.createUser(homer);

  User searchUser = DonationServiceAPI.getUser(user.id);
  assertEquals (homer, searchUser);
  DonationServiceAPI.deleteUser(user);
}
```

- Having created a user, request the user by its ID, and verify that the returned user contains the expected fields

Test GET /api/users

```
@Test
public void testList () throws Exception
{
  List<User> list1 = DonationServiceAPI.getUsers();

  User homer = new User ("homer",  "simpson", "homer@simpson.com",  "secret");
  User marge = new User ("marge",  "simpson", "homer@simpson.com",  "secret");
  User lisa  = new User ("lisa",  "simpson", "homer@simpson.com",  "secret");

  User user1 = DonationServiceAPI.createUser(homer);
  User user2 = DonationServiceAPI.createUser(marge);
  User user3 = DonationServiceAPI.createUser(lisa);

  List<User> list2 = DonationServiceAPI.getUsers();
  assertEquals (list1.size()+3, list2.size());

  DonationServiceAPI.deleteUser(user1);
  DonationServiceAPI.deleteUser(user2);
  DonationServiceAPI.deleteUser(user3);

}
```

- Create three users
- Request a list of all users
- Verify that the list is +3 users

Why This Level of Tests?

- Models stored in databases using JPA need to be throughly tested.
- Specifically - complete tests for:
    - create
    - read
    - update
    - delete
- are essential.
- This is especially the case when Models are involved in relationships (OneToMany, ManyToOne etc..

More Considered UserTest

- “Fixture” created and deleted in setup/teardown
- This fixture is a useful set of test data for many of the tests

```
public class UserTest
{
  static User userArray [] =
  {
    new User ("homer",  "simpson", "homer@simpson.com",  "secret"),
    new User ("lisa",   "simpson", "lisa@simpson.com",   "secret"),
    new User ("maggie", "simpson", "maggie@simpson.com", "secret"),
    new User ("bart",   "simpson", "bart@simpson.com",   "secret"),
    new User ("marge",  "simpson", "marge@simpson.com",  "secret"),
  };

  List <User> userList = new ArrayList<>();

  @Before
  public void setup() throws Exception
  {
    for (User user : userArray)
    {
      User returned = DonationServiceAPI.createUser(user);
      userList.add(returned);
    }
  }

  @After
  public void teardown() throws Exception
  {
    for (User user : userList)
    {
      DonationServiceAPI.deleteUser(user);
    }
  }
```

Tests

- Because a useful fixture has been set up, these tests can then be more considered, concise and through

```
@Test
public void testCreate () throws Exception
{
  assertEquals (userArray.length, userList.size());
  for (int i=0; i<userArray.length; i++)
  {
    assertEquals(userList.get(i), userArray[i]);
  }
}

@Test
public void testList() throws Exception
{
  List<User> list = DonationServiceAPI.getUsers();
  assertTrue (list.containsAll(userList));
}

@Test
public void testDelete () throws Exception
{
  List<User> list1 = DonationServiceAPI.getUsers();
  User testUser = new User("mark",  "simpson", "marge@simpson.com",  "secret");
  User returnedUser = DonationServiceAPI.createUser(testUser);
  List<User> list2 = DonationServiceAPI.getUsers();
  assertEquals (list1.size()+1, list2.size());
  DonationServiceAPI.deleteUser(returnedUser);
  List<User> list3 = DonationServiceAPI.getUsers();
  assertEquals (list1.size(), list3.size());
}
```

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