Agile Software Development

Produced by

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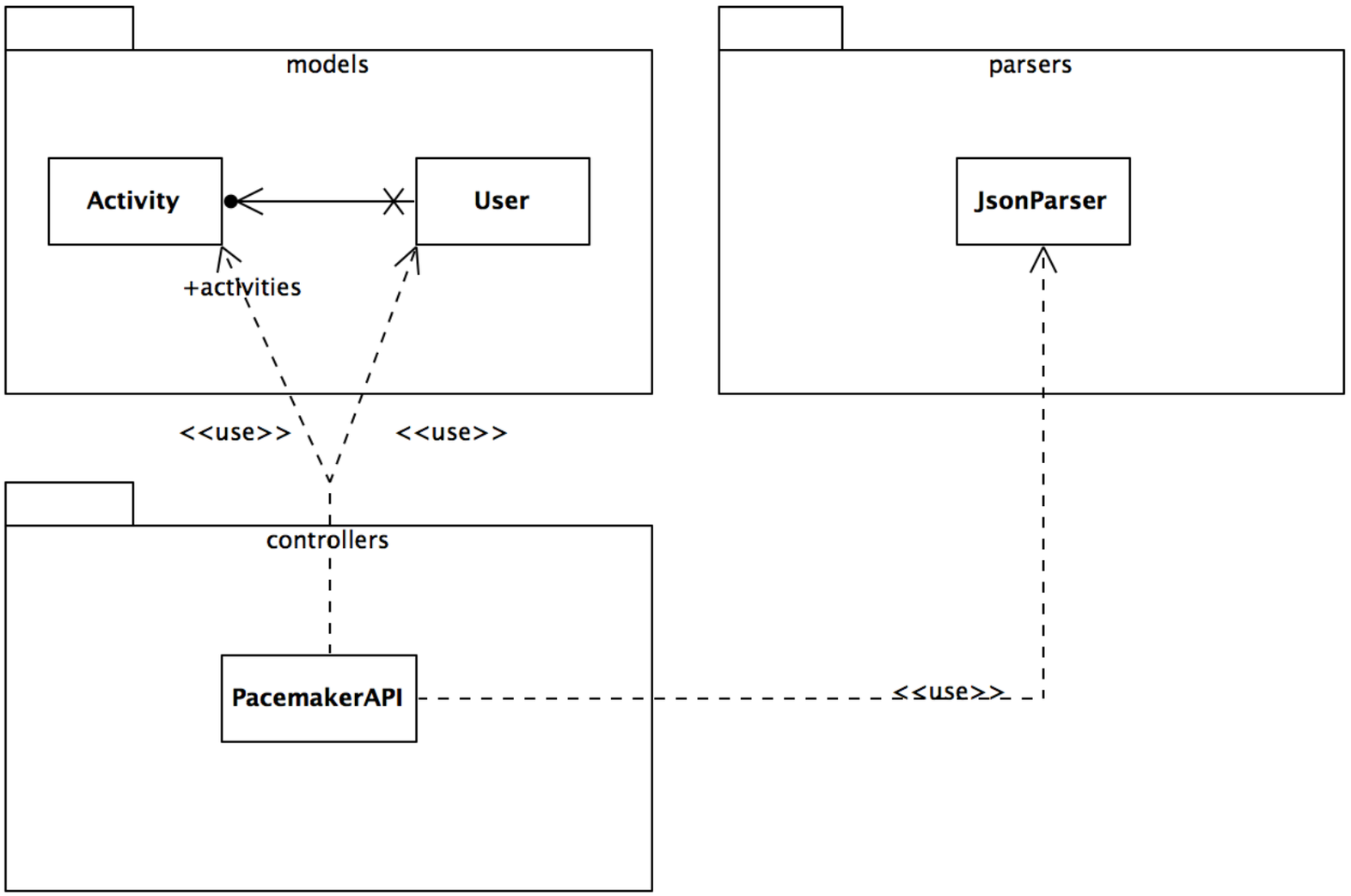
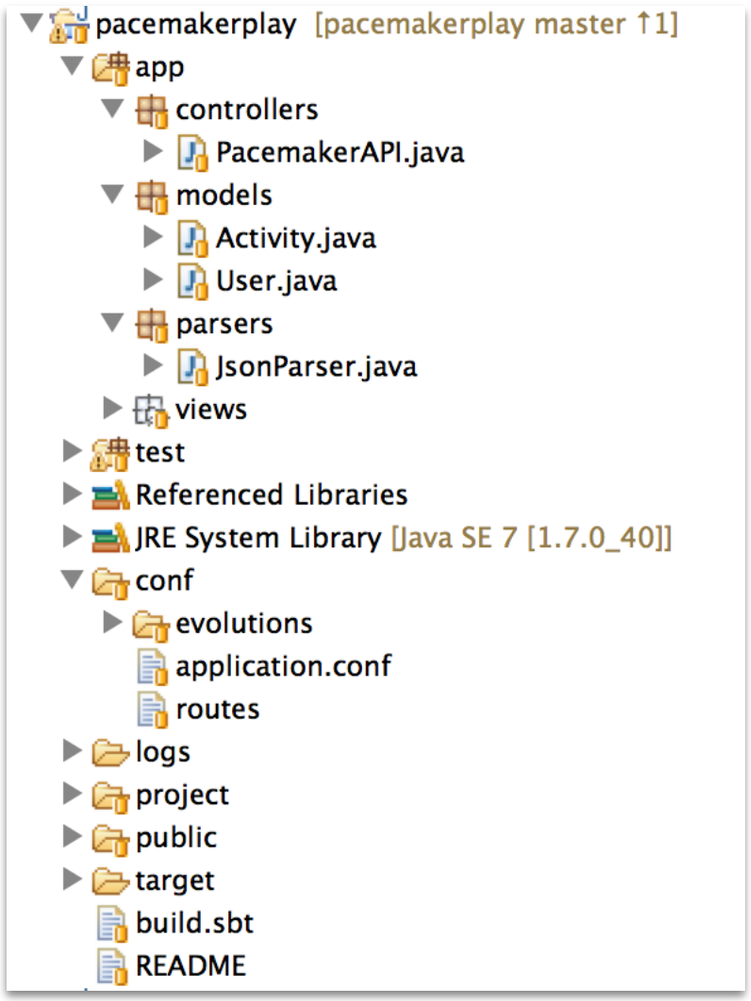
eLearning support unit

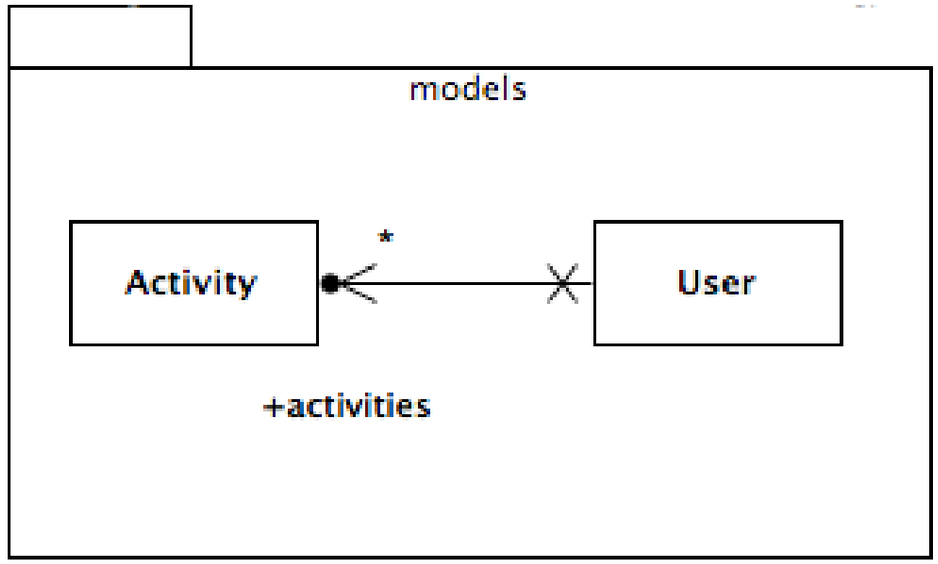
pacemakerplay v2

Model - Class/Package Diagram





Model



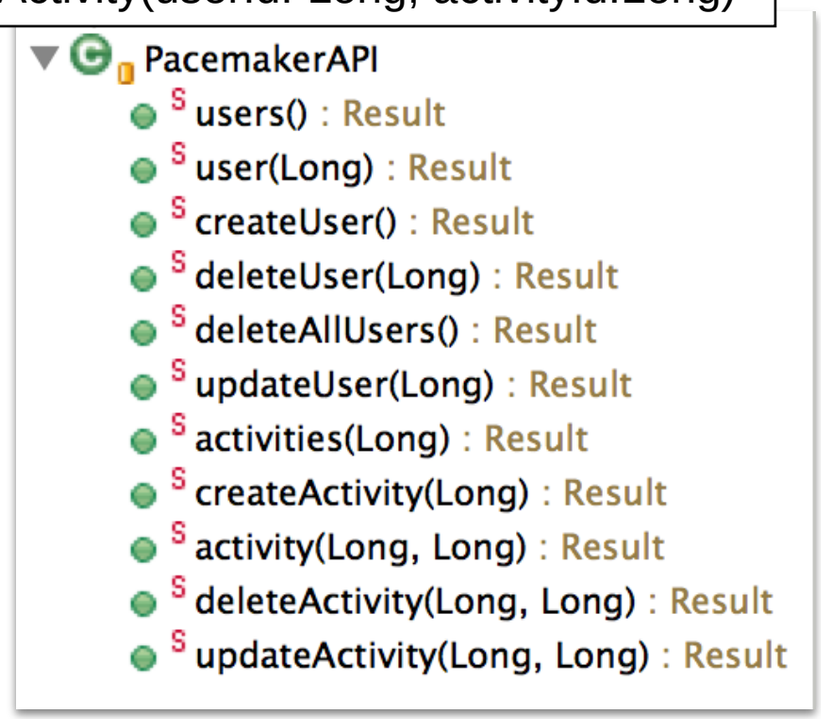

```
@Entity
public class User extends Model
{
  @Id
  @GeneratedValue
  public Long   id;
  public String firstname;
  public String lastname;
  public String email;
  public String password;

  @OneToMany(cascade=CascadeType.ALL)
  public List<Activity> activities = new ArrayList<Activity>();

  //…
}
```

```
@Entity
public class Activity extends Model
{
  @Id
  @GeneratedValue
  public Long   id;
  public String type;
  public String location;
  public double distance;

  //…
}
```

Routes + PacemakerAPI

```
GET       /api/users                                controllers.PacemakerAPI.users()
DELETE    /api/users                                controllers.PacemakerAPI.deleteAllUsers()
POST      /api/users                                controllers.PacemakerAPI.createUser()

GET       /api/users/:id                              controllers.PacemakerAPI.user(id: Long)
DELETE    /api/users/:id                              controllers.PacemakerAPI.deleteUser(id: Long)
PUT       /api/users/:id                              controllers.PacemakerAPI.updateUser(id: Long)

GET       /api/users/:userId/activities                   controllers.PacemakerAPI.activities(userId: Long)
POST      /api/users/:userId/activities                   controllers.PacemakerAPI.createActivity(userId: Long)

GET       /api/users/:userId/activities/:activityId  controllers.PacemakerAPI.activity(userId: Long, activityId:Long)
DELETE    /api/users/:userId/activities/:activityId  controllers.PacemakerAPI.deleteActivity(userId: Long, activityId:Long)
PUT       /api/users/:userId/activities/:activityId  controllers.PacemakerAPI.updateActivity(userId: Long, activityId:Long)
```

- Each route maps to a PacemakerAPI method.
- Support standard Create/Read/Update/Delete (CRUD) operations.



API Namespace

Retrieve / Delete all users	GET	/api/users
	DELETE	/api/users
Create a User	POST	/api/users
Retrieve / Delete / Update a specific user	GET	/api/users/:id
	DELETE	/api/users/:id
	PUT	/api/users/:id

Retrieve all activities for a user	GET	/api/users/:userId/activities
Create an activity for a user	POST	/api/users/:userId/activities
Retrieve / Delete / Update a specific activity	GET	/api/users/:userId/activities/:activityId
	DELETE	/api/users/:userId/activities/:activityId
	PUT	/api/users/:userId/activities/:activityId

A note on **play.db.ebean.Model**

- Play 2.0 comes with Ebean.
- With Ebean, you can use standard JPA annotations e.g. @Entity, @Table, @Id, etc.
- With Ebean, it is very easy to perform CRUD operations on the entity using these methods:

```
void save();
void insert();
void delete();
void update();
```

Actions in Play

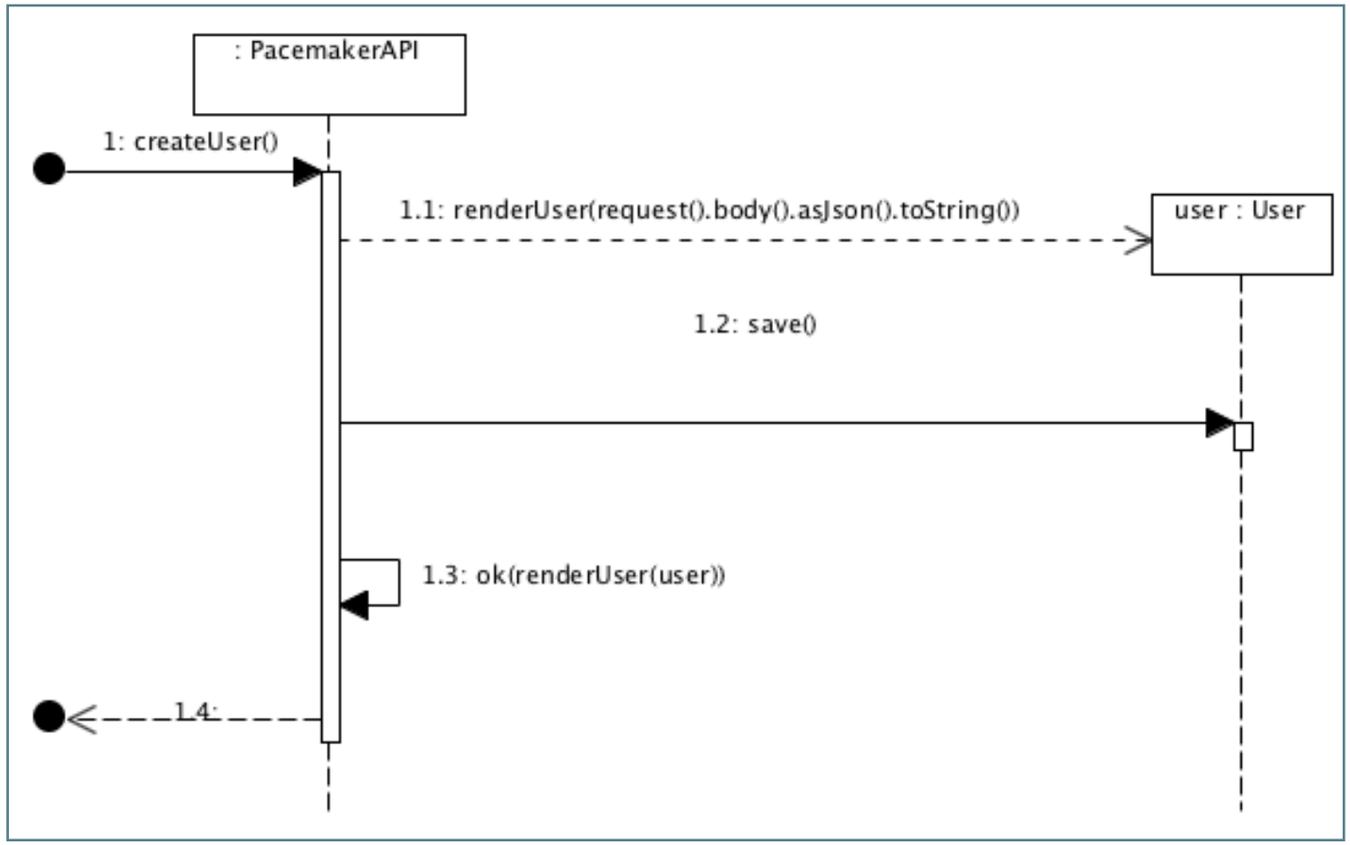
- Most of the requests received by a Play application are handled by an Action.
- An action is basically a Java method that processes the request parameters, and produces a result to be sent to the client.
- An action returns a play.mvc.Result value, representing the HTTP response to send to the web client.

play.mvc.Results

static Results.Status	**badRequest**() Generates a 400 BAD_REQUEST simple result.
static Results.Status	**notFound**() Generates a 404 NOT_FOUND simple result.
static Results.Status	**ok**() Generates a 200 OK simple result.
static Results.Status	**ok**(java.lang.String content) Generates a 200 OK simple result.

Source: https://www.playframework.com/documentation/2.0/JavaActions

createUser - Sequence Diagram




```
public static Result createUser()
{
  User user = renderUser(request().body().asJson().toString());
  user.save();
  return ok(renderUser(user));
}
```

A note on renderUser in JsonParser.java

- In routes.conf, the create user entry is:

  POST /api/users controllers.PacemakerAPI.createUser()

- When your Content-Type header is **application/json,** **request().body().asJson().toString()** retrieves the entire request body sent in a POST request to the play server.

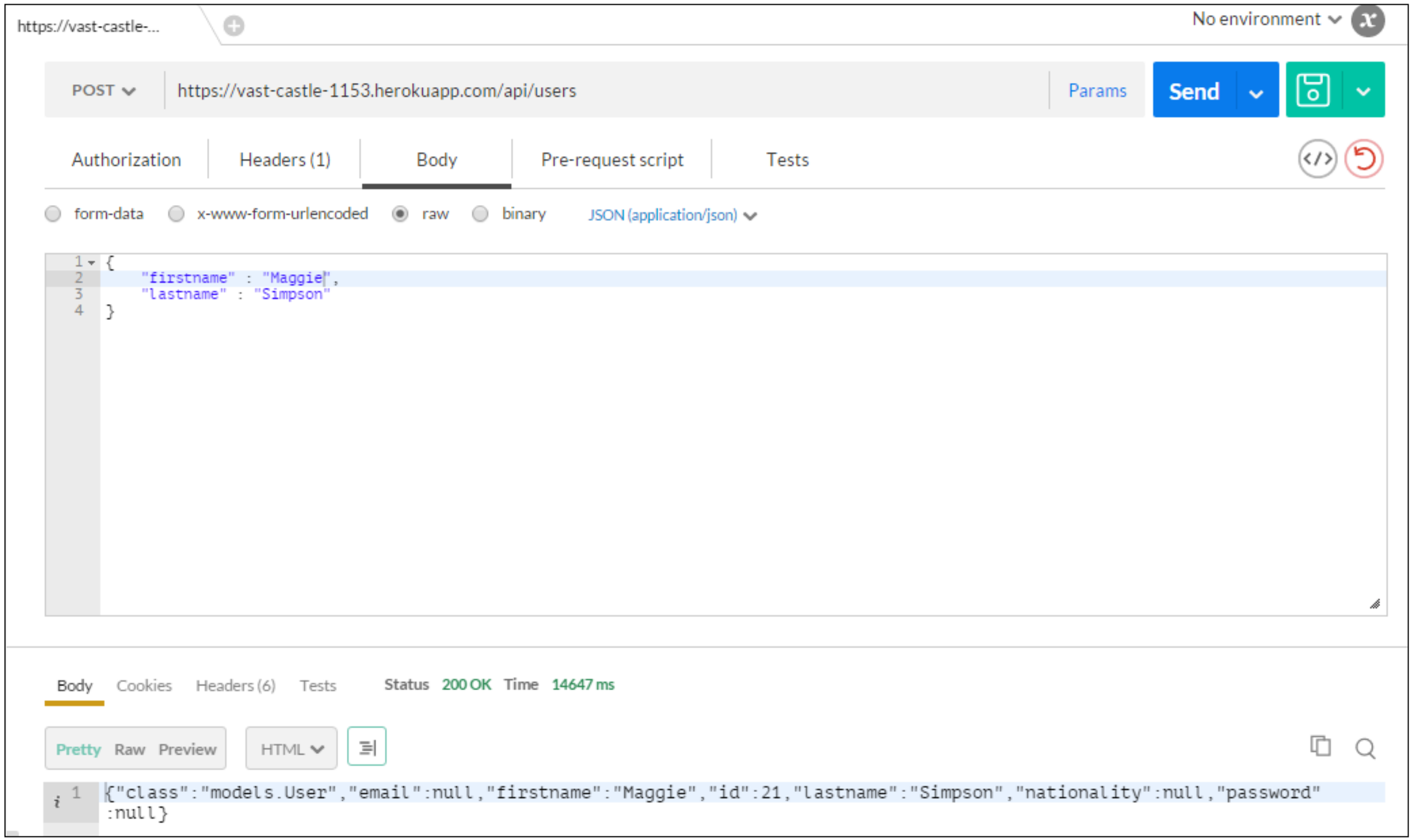
PacemakerAPI.java

```
public static Result createUser(){
  User user = renderUser(request().body().asJson().toString());
  user.save();
  return ok(renderUser(user));
}
```

JsonParser.java

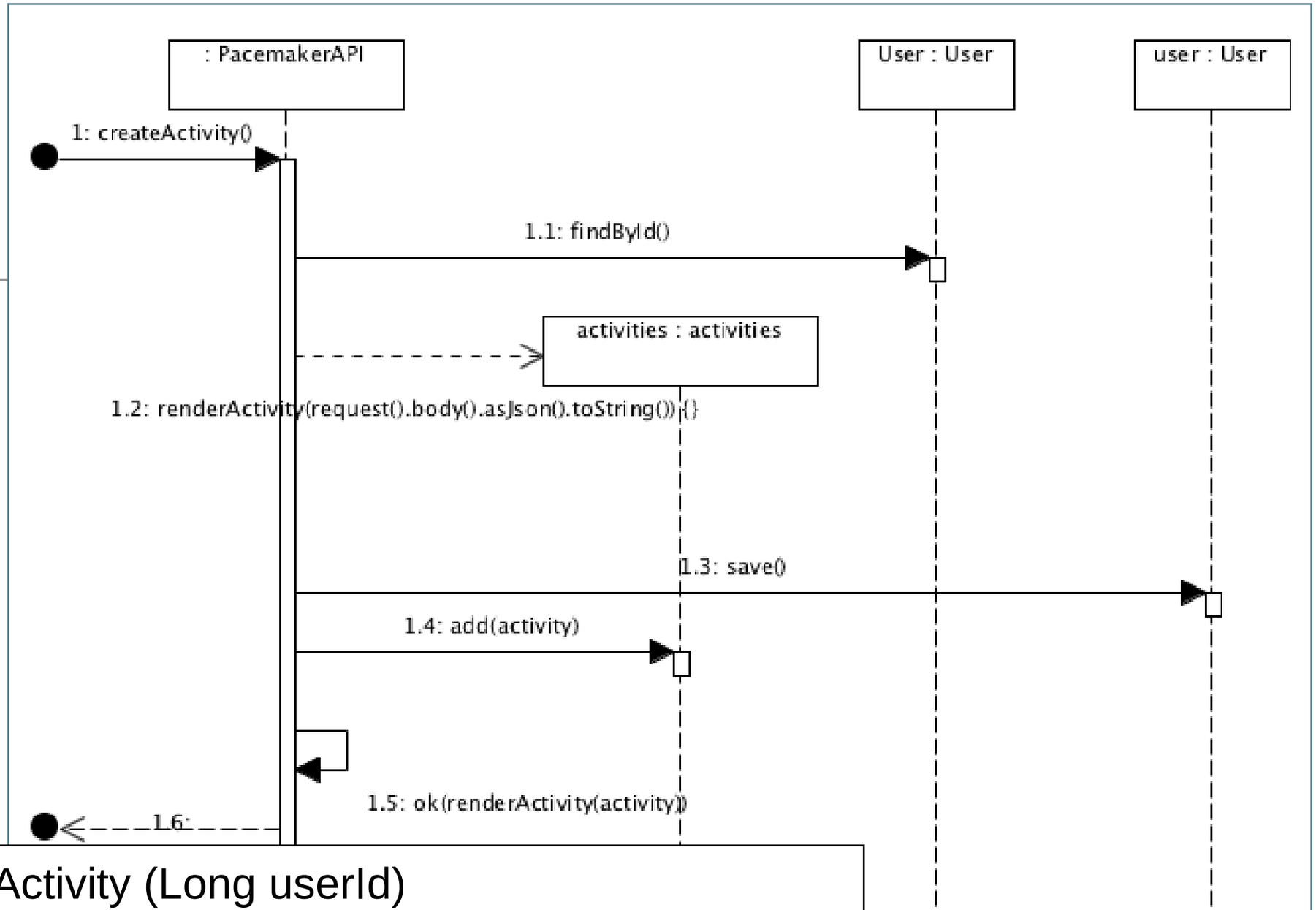
```
public static String renderUser(Object obj)
{
  return userSerializer.serialize(obj);
}
```

Testing create user with POSTMAN



createActivity

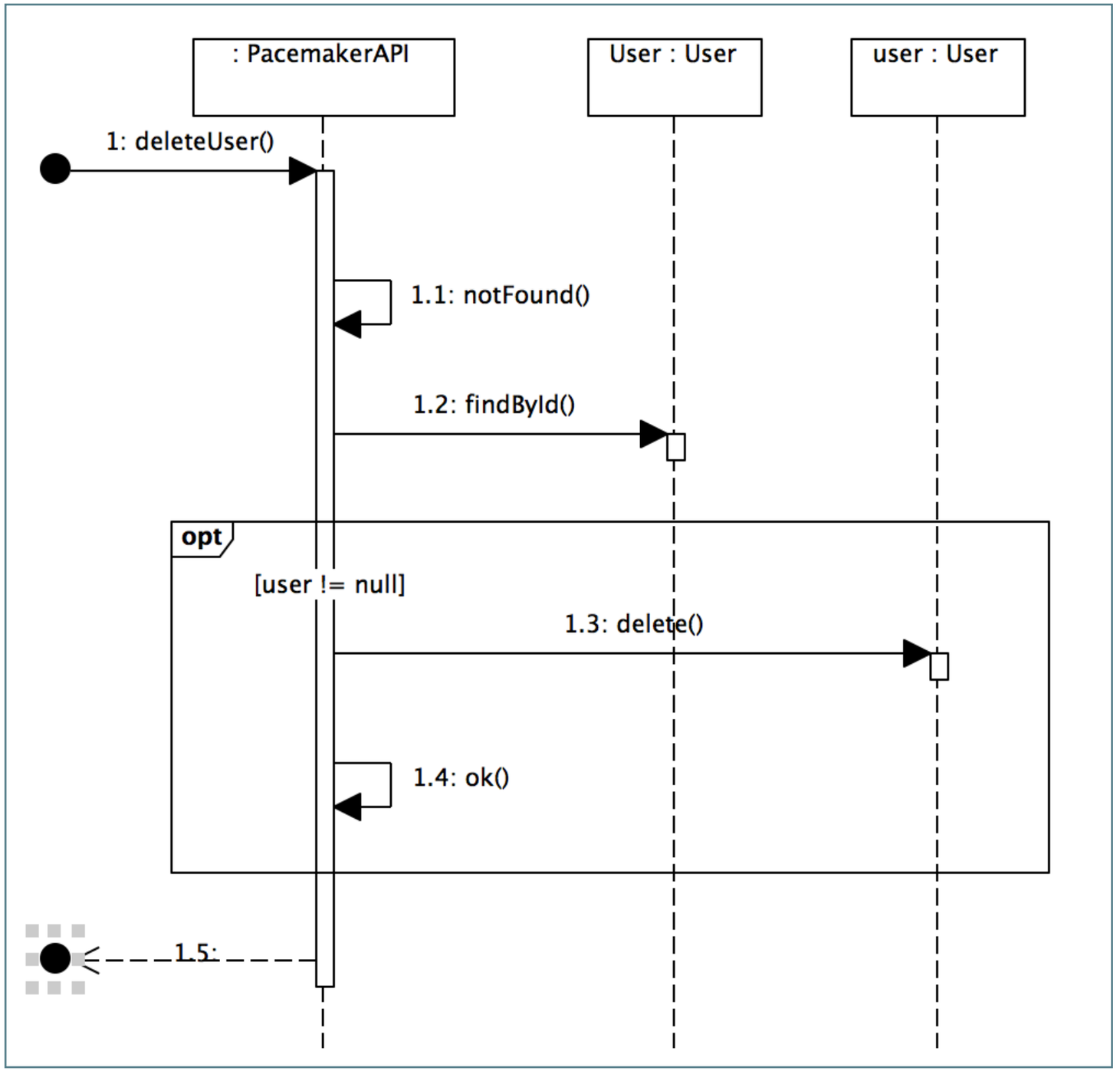
Sequence Diagram

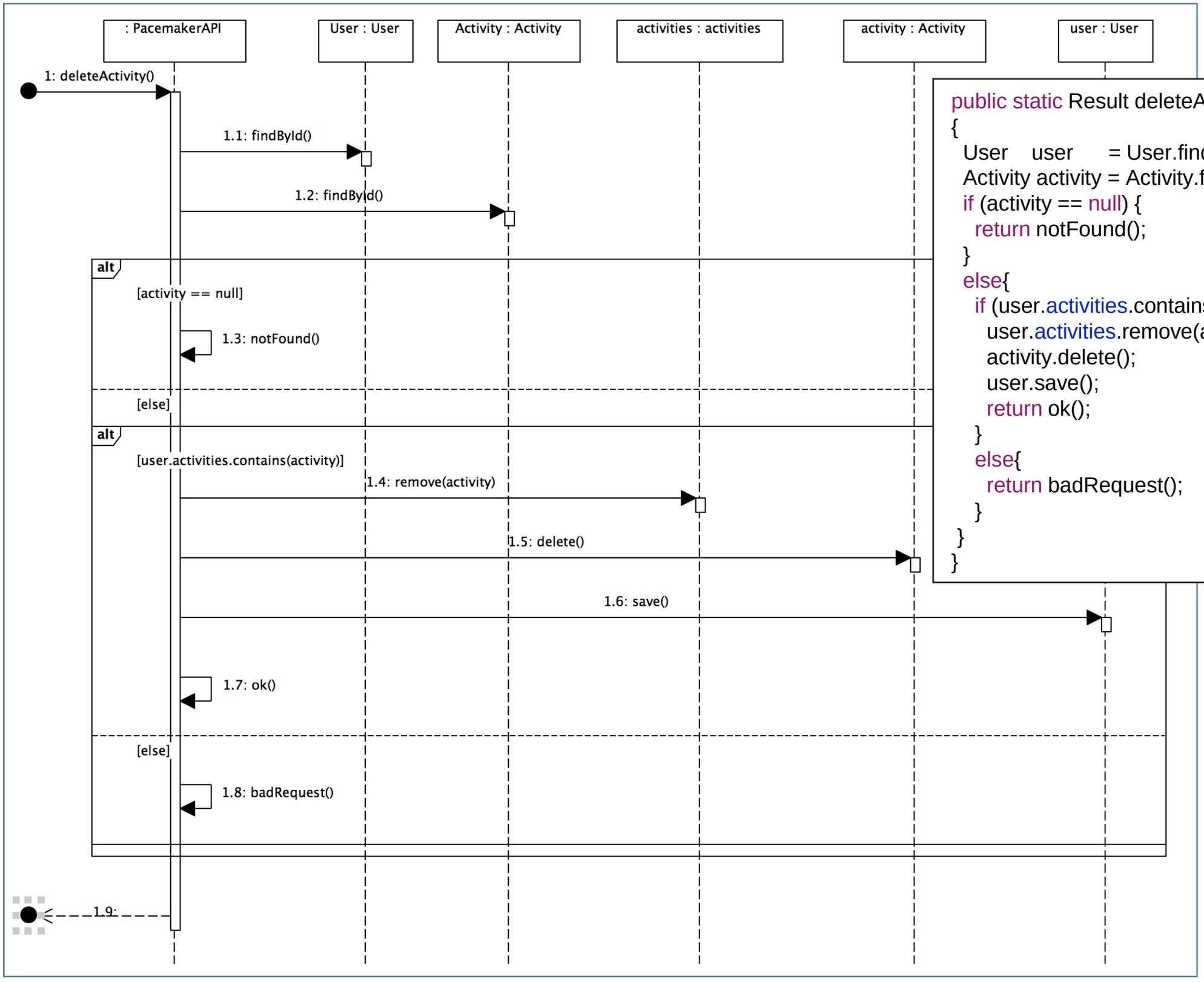



```
public static Result createActivity (Long userId)
{
  User    user     = User.findById(userId);
  Activity activity = renderActivity(request().body().asJson().toString());

  user.activities.add(activity);
  user.save();

  return ok(renderActivity(activity));
}
```

deleteUser - Sequence Diagram

```
public static Result deleteUser(Long id)
{
   Result result = notFound();
   User user = User.findById(id);
   if (user != null)
   {
      user.delete();
      result = ok();
   }
   return result;
}
```

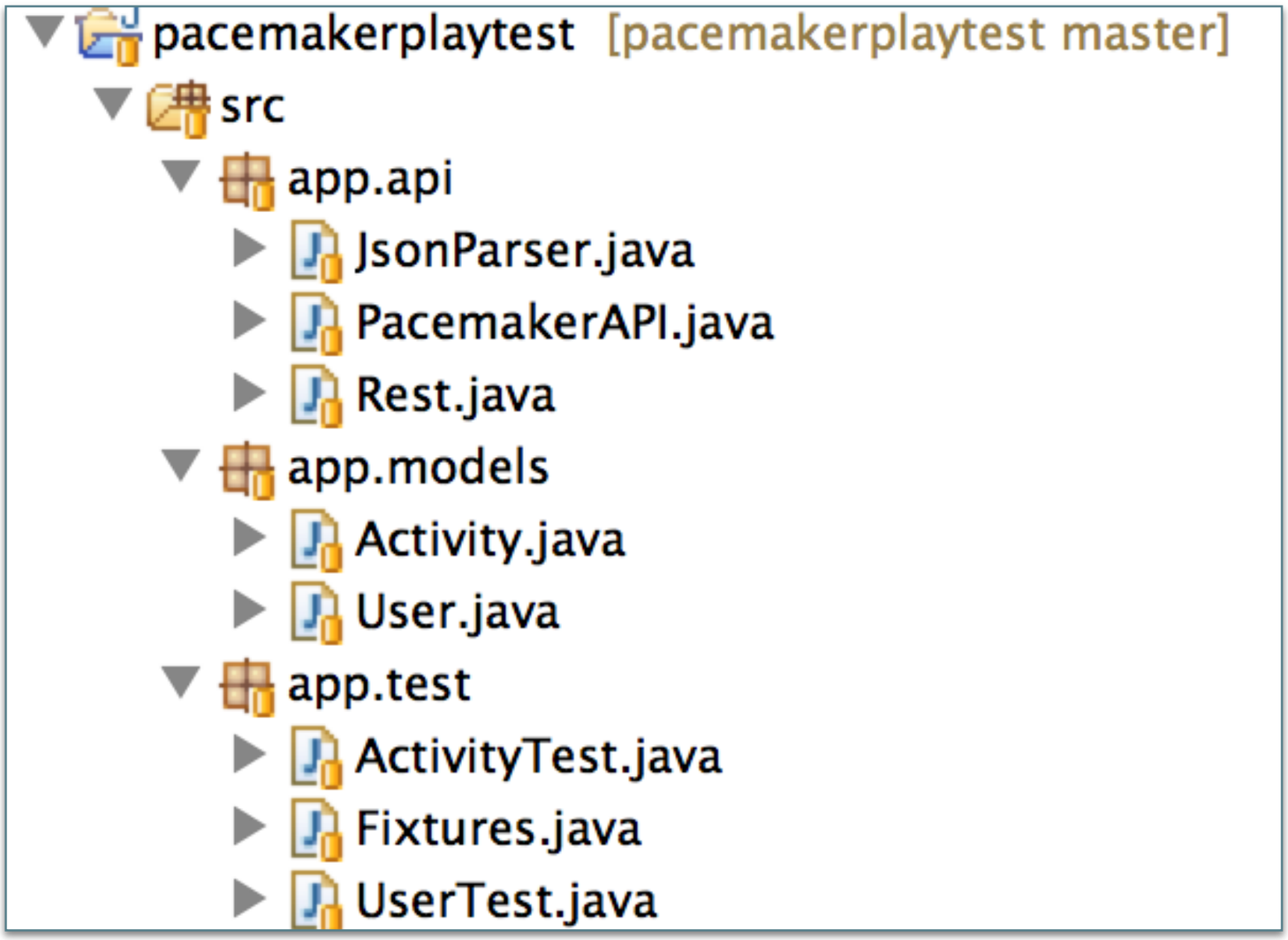





```
public static Result deleteActivity (Long userId, Long activityId)
{
  User    user     = User.findById(userId);
  Activity activity = Activity.findById(activityId);
  if (activity == null) {
    return notFound();
  }
  else{
    if (user.activities.contains(activity)){
      user.activities.remove(activity);
      activity.delete();
      user.save();
      return ok();
    }
    else{
      return badRequest();
    }
  }
}
```

deleteActivity – Sequence Diagram

Pacemakerplaytest



Fixtures

```
public class Fixtures
{

  static String userJson = "{\n"
                         +  "\"email\"    : \"jim@simpson.com\" ,\n"
                         +  "\"firstName\": \"Jim\"             ,\n"
                         +  "\"lastName\" : \"Simpson\"         ,\n"
                         +  "\"password\" : \"secret\"          \n"
                       + "}";

  static String activityJson  = "{\n"
                              +  "\"type\"     : \"run\"              ,\n"
                              +  "\"location\"  : \"Dunmore\"           ,\n"
                              +   "\"distance\"  : 3                    \n"
                            + "}";

  static User users[] = {
                          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"),
                        };
```

ActivityTest (1)

```
public class ActivityTest
{
  private User     user;
  private Activity activity;

  @Before
  public void setUp() throws Exception
  {
    user     = new User ("mark", "simpson", "mark@simpson.com", "secret");
    activity  = new Activity ("run",  "tramore", 3);

    user = PacemakerAPI.createUser(Fixtures.userJson);
  }

  @After
  public void tearDown() throws Exception
  {
    Rest.delete("/api/users");
  }

  @Test
  public void createActivityJson() throws Exception
  {
    Activity activity  = PacemakerAPI.createActivity(user.id, Fixtures.activityJson);
    Activity getResponse = PacemakerAPI.getActivity(user.id, activity.id);

    assertTrue(activity.equals(getResponse));

    PacemakerAPI.deleteActivity(user.id, activity.id);
  }

  @Test
  public void createActivityObj() throws Exception
  {
    Activity createResponse = PacemakerAPI.createActivity(user.id, activity);
    assertEquals(activity, createResponse);

    Activity getResponse = PacemakerAPI.getActivity(user.id, createResponse.id);
    assertEquals(activity, getResponse);

    PacemakerAPI.deleteActivity(user.id, createResponse.id);
  }
```

ActivityTest (2)

```
@Test
public void updateActivity() throws Exception
{
  Activity createResponse = PacemakerAPI.createActivity(user.id, activity);
  assertEquals(activity, createResponse);

  activity.distance = 12;
  activity.location = "connemara";
  Activity updateResponse = PacemakerAPI.updateActivity(user.id, createResponse.id, activity);
  assertEquals(activity, updateResponse);

  PacemakerAPI.deleteActivity(user.id, createResponse.id);
}

@Test
public void getActivities() throws Exception
{
  Activity createResponse = PacemakerAPI.createActivity(user.id, activity);

  List<Activity> activities = PacemakerAPI.getActivities(user.id);
  assertEquals(1, activities.size());

  assertEquals(activity, activities.get(0));
  PacemakerAPI.deleteActivity(user.id, createResponse.id);
}


@Test
public void getMultipleActivities() throws Exception
{
  Activity createResponse = PacemakerAPI.createActivity(user.id, activity);

  Activity activity2  = new Activity ("ride",  "tramore", 3);
  Activity createResponse2 = PacemakerAPI.createActivity(user.id, activity2);

  List<Activity> activities = PacemakerAPI.getActivities(user.id);
  assertEquals(2, activities.size());

  assertEquals(activity, activities.get(0));
  assertEquals(activity2, activities.get(1));
  PacemakerAPI.deleteActivity(user.id, createResponse.id);
  PacemakerAPI.deleteActivity(user.id, createResponse2.id);
}
```