

CPSC 476: ASSIGNMENT 4

SHARED EVENTS CALENDAR USING JPA

CSPC 476 Assignment 4

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DESCRIPTION

In this assignment, I update previous assignment to use JPA. JPA is “the Java Persistence API provides a POJO (Plain Old Java Objects) persistence model for object-relational mapping.”¹ JPA is just a specification. It requires a JPA implementation and database to persist. I used eclipselink and HSQLDB.

TO change POJOs class in previous assignment to become entities, I added JPA annotation to the User.java and Event.java as following:

```
@Entity
@Table(name = "User")
public class User implements Serializable
```

```
@Entity
@Table(name = "Event")
public class Event implements Comparable<Event>,Serializable
```

For primary key I add this annotation for both entities:

```
@Id
@GeneratedValue(strategy = GenerationType.AUTO)
```

The relationship for whom user create event is defined in both entities as following

In Event.java

```
@ManyToOne(fetch=FetchType.EAGER ,optional = false)
@JoinColumn(name = "createdBy")
```

¹ <http://www.oracle.com/technetwork/java/javaee/tech/persistence-jsp-140049.html>

```
public User getCreatedBy() {...}
```

In User.java

```
@OneToMany(mappedBy = "createdBy", fetch = FetchType.EAGER )
@OrderBy("eventTime ASC")
private Set<Event> createdEvents= new TreeSet<Event>() ;
```

To define **Like** relationship between users and events, I added it in both entities as following

In Event.java

```
@ManyToMany(cascade = CascadeType.ALL,fetch = FetchType.EAGER,mappedBy =
"interestedEvents")
public Set<User> getUserInterested() {...}
```

In User.java

```
@ManyToMany(fetch = FetchType.EAGER, cascade = CascadeType.ALL)
@OrderBy("eventTime ASC")
@JoinTable(
    name = "InterestedEvents",
    joinColumns = @JoinColumn(name = "userId",referencedColumnName ="id") ,
    inverseJoinColumns = @JoinColumn(name = "eventId",referencedColumnName ="id")
)
private Set<Event> interestedEvents= new TreeSet<>() ;
```

JPA 2.1 not support java.time.LocalDateTime

JPA 2.1 does not directly support the java.time API. So, I create LocalDateAttributeConverter implements AttributeConverter<LocalDateTime, Timestamp> to easily integrate java.time.LocalDateTime with JPA. I have to add it in persistence.xml.

```
@Converter(autoApply = true)
public class LocalDateAttributeConverter implements AttributeConverter<LocalDateTime,
Timestamp> {

    @Override
    public Timestamp convertToDatabaseColumn(LocalDateTime locDateTime) {
        return (locDateTime == null ? null : Timestamp.valueOf(locDateTime));
    }
    @Override
    public LocalDateTime convertToEntityAttribute(Timestamp ts) {
        return (ts == null ? null : ts.toLocalDateTime());
    }
}
```

Persistence Unit

I create a persistence unit and define provider

-org.eclipse.persistence.jpa.PersistenceProvider-. I turned on schema generation by set property "eclipselink.ddl-generation" with value "drop-and-create-tables" and allow eclipselink to create new tables for Entities. Persistence.xml will appeared as following:

```
<?xml version="1.0" encoding="UTF-8"?>
<persistence version="2.0" xmlns="http://java.sun.com/xml/ns/persistence"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://java.sun.com/xml/ns/persistence
http://java.sun.com/xml/ns/persistence/persistence_2_0.xsd">
  <persistence-unit name="EventsPU" transaction-type="RESOURCE_LOCAL">
    <provider>org.eclipse.persistence.jpa.PersistenceProvider</provider>
    <class>master.cpsc476.Event</class>
    <class>master.cpsc476.User</class>
    <class>master.cpsc476.LocalDateAttributeConverter</class>
    <exclude-unlisted-classes>true</exclude-unlisted-classes>
    <properties>
<!-- eclipselink properties -->
      <property name="eclipselink.ddl-generation" value="drop-and-create-tables"/>
      <property name="eclipselink.logging.level" value="ALL"/>
<!-- hsqldb detail -->
      <property name="javax.persistence.jdbc.driver" value="org.hsqldb.jdbcDriver"/>
      <property name="javax.persistence.jdbc.url"
value="jdbc:hsqldb:hsqldb:/localhost/cpsc476"/>
      <property name="javax.persistence.jdbc.user" value="SA"/>
      <property name="javax.persistence.jdbc.password" value="Passw0rd"/>
    </properties>
  </persistence-unit>
</persistence>
```

Updation in EventsDispatcher-servlet.xml

- Add persistence unit manager and set its location:

```
<bean id="persistenceUnitManager"
  class="org.springframework.orm.jpa.persistenceunit.DefaultPersistenceUnitManager">
  <property name="persistenceXmlLocations">
    <list>
      <value>classpath*:META-INF/persistence.xml</value>
    </list>
  </property>
```

```
</bean>
```

- Configure transaction manager:

```
<bean id="entityManagerFactory" class=
    "org.springframework.orm.jpa.LocalContainerEntityManagerFactoryBean">
    <property name="persistenceUnitManager" ref="persistenceUnitManager"/>
</bean>
```

```
<!-- Add Transaction support -->
```

```
<bean id="myTxManager"
    class="org.springframework.orm.jpa.JpaTransactionManager">
    <property name="entityManagerFactory" ref="entityManagerFactory"/>
</bean>
```

```
<!-- Use @Transaction annotations for managing transactions -->
```

```
<tx:annotation-driven transaction-manager="myTxManager" />
```

What change in existing DAO interfaces?

1. Change methods likeEvent and unlikeEvent parameters "Long userId, Long eventId" to classes

```
public boolean likeEvent(User user, Event event) ;
public boolean unlikeEvent(User user, Event event) ;
```

This change to make entityManager to merge the state of the user and event entities into the current persistence context.

2. Drop the following method because JPA will load the entity's relationship to collections eagerly.

```
public List<Event> findEventsCreatedByUser(Long userId);
public List<Event> findEventsInterestedByUser(Long userId);
```

3. For createEvent method, add creator user to parameter. I need it to update user entity by call merge() in entityManager.

```
public Event createEvent(Event event, User user){
    ....
```

```
event.setCreatedBy(user);  
user.getCreatedEvents().add(event);  
entityManager.persist(event);  
entityManager.merge(user);
```

```
.....
```

```
}
```

BUILD INSTRUCTIONS

To packaging and deploying this assignment using Maven, we have to do the following:

- Update Assignment 3 pom.xml by add dependencies.
- Update tomcat config/context.xml
- for package execute

```
mvn package
```

- or for deploy execute after start tomcat manager

```
mvn tomcat7:deploy
```

- Or because I set the default goal, you can just

```
mvn
```

```
<defaultGoal>tomcat7:deploy</defaultGoal>
```

Note: sometime When I redeploy the application to the web server using Netbeans the .lck file is not properly released and the HSQL server cannot load the file. So we have to delete test.lck under \${tomcatHome}/bin/hsqldb/localhost to avoid this issue.

Prepare pom.xml:

- Add Maven dependencies for eclipselink

```
<dependency>  
  <groupId>org.eclipse.persistence</groupId>
```

```
<artifactId>eclipselink</artifactId>
<version>2.5.0</version>
</dependency>
<dependency>
  <groupId>org.eclipse.persistence</groupId>
  <artifactId>javax.persistence</artifactId>
  <version>2.1.0</version>
</dependency>
```

- Add Maven dependencies for Validator

```
<dependency>
  <groupId>org.hibernate</groupId>
  <artifactId>hibernate-validator</artifactId>
  <version>5.2.4.Final</version>
  <exclusions>
    <exclusion>
      <groupId>javax.xml.bind</groupId>
      <artifactId>jaxb-api</artifactId>
    </exclusion>
    <exclusion>
      <groupId>com.sun.xml.bind</groupId>
      <artifactId>jaxb-impl</artifactId>
    </exclusion>
  </exclusions>
</dependency>
<dependency>
  <groupId>javax.validation</groupId>
  <artifactId>validation-api</artifactId>
  <version>1.0.0.GA</version>
</dependency>
```

Update tomcat config/context.xml

1. In tomcat path, open file config/context.xml
2. add the following resource:

```
<Resource name="jdbc/dataSource" type="javax.sql.DataSource" maxActive="25"  
maxIdle="5" maxWait="10000" username="SA" password="Passw0rd"  
driverClassName="org.hsqldb.jdbcDriver"  
url="jdbc:hsqldb:hsqldb://localhost/cpsc476;ifexists=true" />
```


DEMONSTRATING

Because nothing change in view layer, the screens are same as in Assignment 1.

Assignment URL is <http://localhost:8080/assignment4>

Main screen without login contains events list, and top page contains login form and link sign-up link. The title in events list is link to event detail.

← → ↺

localhost:8080/assignment1/Events?action=list

Welcome Guest

email

Email Id

Password

Password

Login

[Signup](#)

Events List





Title	Time	Location
Summit Event Productions	Jan 21,2017 13:00	2627 e la palma ave
Impulse Event Lighting	Dec 01,2016 11:30	516 Cameron St, Placentia
Fun On Wheels	Feb 29,2016 13:00	16801 Euclid Street

To login: user the following information:

email: mmubarki@gmail.com

password: 123456

After login: controller method: signin() forward into user detail screen. It contains user information, user's interested events list, and user created events list. User has option to drop unlike events from interested events list. Also each event has link to its detail. Each event in interested or created can be add to google calendar.

    localhost:8080/assignment1/Events?action=userHome&userId=1





Welcome mussa

[Your Detail](#) | [Events List](#) | [Signout](#)



User Detail:

Name: mussa
Name: mmubarki@gmail.com

Interested Events

- [Impulse Event Lighting in : Dec 01,2016 11:30 at : 516 Cameron St, Placentia](#)  
- [Summit Event Productions in : Jan 21,2017 13:00 at : 2627 e la palma ave](#)  

Mine Events

- [Impulse Event Lighting in : Dec 01,2016 11:30 at : 516 Cameron St, Placentia](#) 
- [Summit Event Productions in : Jan 21,2017 13:00 at : 2627 e la palma ave](#) 

[create new event](#)

Main page if login contains event list and link to create new event, and top page contains three links: to user detail page, to events list, and sign-out link.

localhost:8080/assignment1/Events?action=list

Welcome ali

[Your Detail](#) | [Events List](#) | [Signout](#)

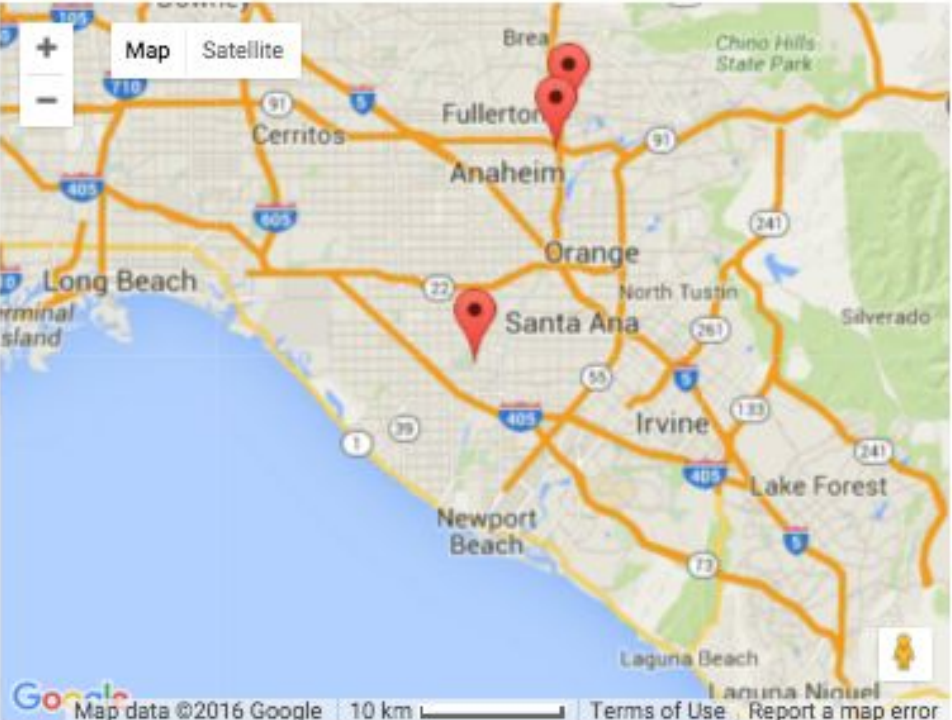
Events List

[create event](#)

Title	Time	Location	
Summit Event Productions	Jan 21,2017 13:00	2627 e la palma ave	✓
Impulse Event Lighting	Dec 01,2016 11:30	516 Cameron St, Placentia	✓
Fun On Wheels	Feb 29,2016 13:00	16801 Euclid Street	✓

Map

Satellite



Event view without login. It contains link to events list.

←

→

↺

localhost:8080/assignment1/Events?action=view&eventId=1

Welcome Guest

email

Email Id

Password

Password

Login

Signup

[Events List](#)

Event View

Title

Summit Event Productions

Description

We are a boutique lighting design production company based in the MD/DC/VA area

Time

Jan 21,2017 13:00

Location

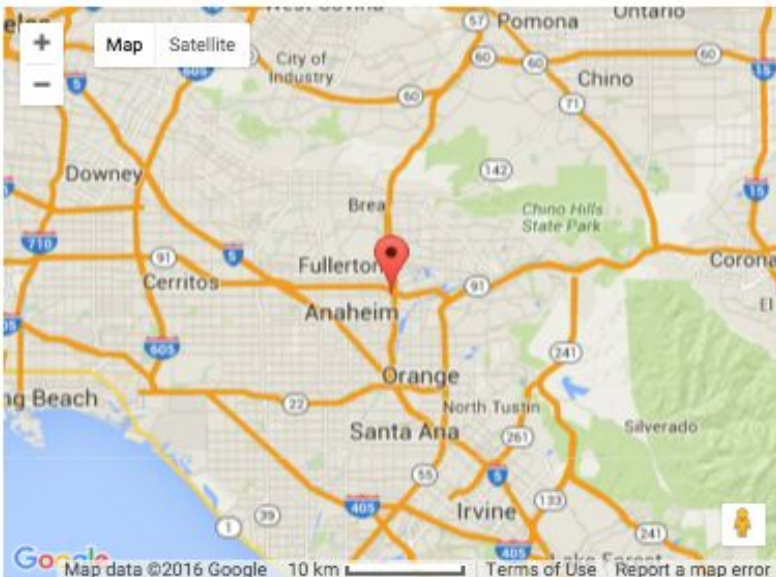
2627 e la palma ave

+

Map

Satellite

-



Event view if login. It contains link to create event.

[←](#) [→](#) [↻](#) [localhost:8080/assignment1/Events?action=view&eventId=1](#)

Welcome mussa

[Your Detail](#) | [Events List](#) | [Signout](#)

[create event](#)

Event View

Title
Summit Event Productions

Description
We are a boutique lighting design production company based in the MD/DC/VA area

Time
Jan 21,2017 13:00

Location
2627 e la palma ave



Sing-up form with validation

← → ↻ localhost:8080/assignment1/Events?action=signup&email=ali@gmail.com

[Home](#)


Signup Form

Your Name

email

Password

Confirm

 Please match the requested format.
length must be six or more

[Cancel](#)

create new event form

[←](#) [→](#) [↻](#) [📄](#) localhost:8080/assignment1/Events?action=create

Welcome mussa

[Your Detail](#) | [Events List](#) | [Signout](#)

Create New Event

Title

Description

Time

Location

[show](#)



In create new event form: uses dateTime-local input type. It is not supported in Firefox and Internet Explorer.

[←](#) [→](#) [↻](#) [localhost:8080/assignment1/Events?action=create](#)

Welcome ali

[Your Detail](#) | [Events List](#) | [Signout](#)

Create New Event

Title

Event Title

Description

Event Description

Time

mm/dd/yyyy, --:--:--

February 2016

Sun	Mon	Tue	Wed	Thu	Fri	Sat
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	1	2	3	4	5

[show](#)

Create new event after filled

Welcome ali

[Your Detail](#) | [Events List](#) | [Signout](#)

Create New Event

Title

Fun On Wheels

Description

Fun on Wheels Mobile Recreation Program is a free drop-in program designed to bring recreation and other resources into the neighborhoods for children, ages 5-18. The program offers homework assistance, fitness fun, art enrichment, and resource materials. No registration is needed! All programs

Time

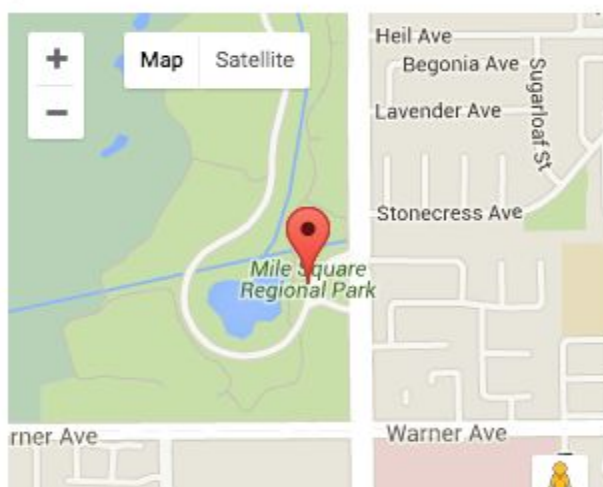
02/29/2016, 01:00 PM

Location

16801 Euclid Street

[show](#)

Create



View event after creation

[←](#) [→](#) [↻](#) [localhost:8080/assignment1/Events?action=view&eventId=3](#) [🔍](#) [★](#) [📄](#) [☰](#)

Welcome ali

[Your Detail](#) | [Events List](#) | [Signout](#)

successfull created event:Fun On Wheels

[create event](#)


Event View

[Title](#)
Fun On Wheels

[Description](#)
Fun on Wheels Mobile Recreation Program is a free drop-in program designed to bring recreation and other resources into the neighborhoods for children, ages 5-18. The program offers homework assistance, fitness fun, art enrichment, and resource materials. No registration is needed! All programs are closed on holidays and days of inclement weather

[Time](#)
Feb 29,2016 13:00

[Location](#)
16801 Euclid Street

A map of the Santa Ana area in Orange County, California. The map shows major highways including I-5, I-405, SR-91, SR-241, and SR-133. Cities and towns labeled include Brea, Fullerton, Anaheim, Orange, Santa Ana, North Tustin, Silverado, Irvine, Lake Forest, Newport Beach, Long Beach, and Cerritos. A red pin is located in the Santa Ana area, near the intersection of I-5 and SR-241. The map also shows Chino Hills State Park to the northeast and the Pacific Ocean to the southwest.

Add event into interested list

←

→

↺

localhost:8080/assignment1/Events?action=list

Welcome ali

[Your Detail](#)

|

[Events List](#)

|

[Signout](#)

event:Impulse Event Lighting added to interested list

Events List

[create event](#)

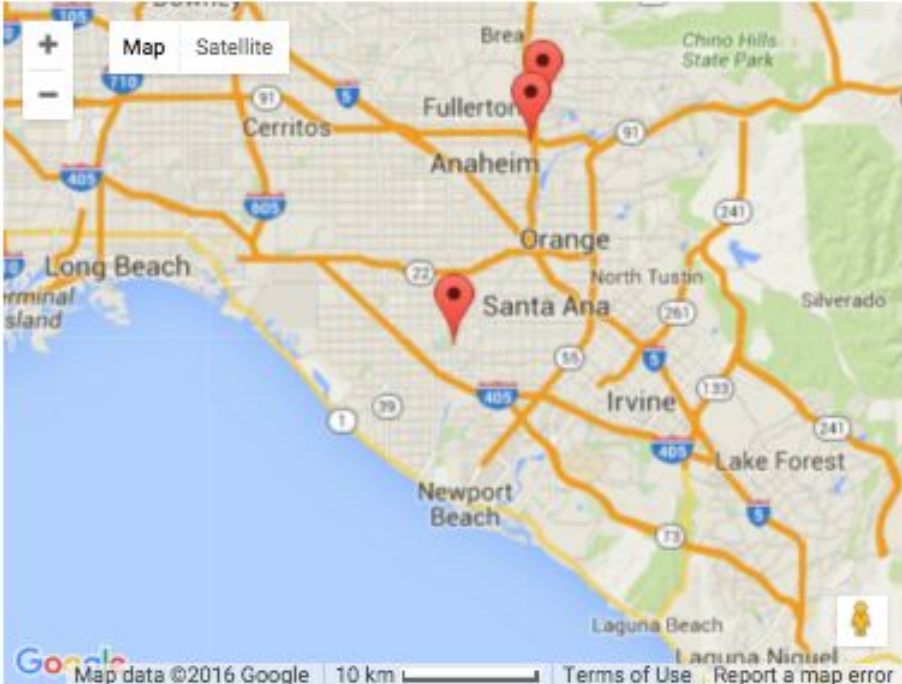
Title	Time	Location	
Summit Event Productions	Jan 21,2017 13:00	2627 e la palma ave	✓
Impulse Event Lighting	Dec 01,2016 11:30	516 Cameron St, Placentia	
Fun On Wheels	Feb 29,2016 13:00	16801 Euclid Street	✓

+

Map





Satellite

-



Map data ©2016 Google 10 km Terms of Use Report a map error

Drop event from interested list

 localhost:8080/assignment1/Events?action=userHome&userId=2

Welcome ali

[Your Detail](#) | [Events List](#) | [Signout](#)

event:Impulse Event Lighting removed from interested list

User Detail:

Name: ali
Name: ali@gmail.com

Interested Events

You are not select any events

Mine Events

- [Fun On Wheels in : Feb 29,2016 13:00 at : 16801 Euclid Street](#)

[create new event](#)