Homework 9: Event Search Android App

1. Objectives

- Become familiar with Java, XML, Android Lifecycle and Android Studio for Android app development.
- Build a good-looking Android app.
- Learn to use the Google Maps APIs and Android SDK.
- Get familiar with third party libraries like Picasso, Glide and Volley.

2. Background

2.1 Android Studio

Android Studio is the official Integrated Development Environment (IDE) for Android application development, based on IntelliJ IDEA - a powerful Java IDE. On top of the capabilities you expect from IntelliJ, Android Studio offers:

- Flexible Gradle - based build system.
- Build variants and multiple apk file generation.
- Code templates to help you build common app features.
- Rich layout editor with support for drag and drop theme editing.
- Lint tools to catch performance, usability, version compatibility, and other problems.
- ProGuard and app-signing capabilities.
- Built-in support for Google Cloud Platform, making it easy to integrate Google Cloud Messaging and App Engine.

More information about Android Studio can be found at:
http://developer.android.com/tools/studio/index.html

2.2. Android

Android is a mobile operating system initially developed by Android Inc., a firm purchased by Google in 2005. Android is based upon a modified version of the Linux kernel. As of Nov 2018, Android was the number 1 mobile OS, in unit sales, surpassing iOS, while iOS was still the most profitable platform.

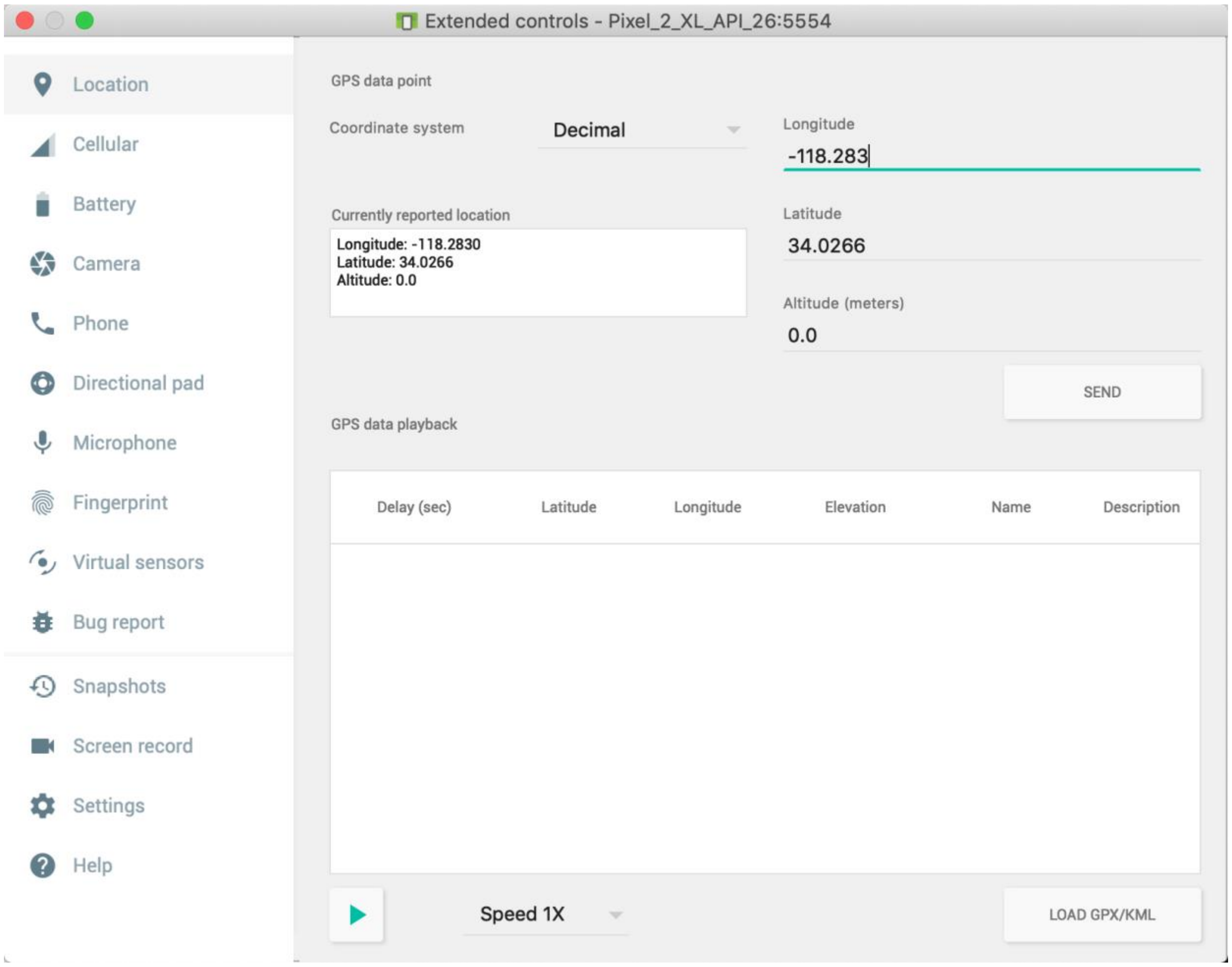
The Official Android home page is located at:
http://www.android.com/

The Official Android Developer home page is located at:
http://developer.android.com/

3. Prerequisites

This homework requires the use of the following components:

- Download and install Android Studio. Technically, you may use any other IDE other than Android Studio such as Eclipse, but the latest SDKs may not be supported with Eclipse. We will not be providing any help on problems arising due to your choice of alternate IDEs.
- You must use the **emulator**. Everything should just work out of the box. Before you start, you need to manually set the emulator's longitude and latitude nearby USC. An example is shown in Figure 1.



Coordinate system: Decimal

Longitude: -118.283

Latitude: 34.0266

Altitude (meters): 0.0

Currently reported location

```
Longitude: -118.2830
Latitude: 34.0266
Altitude: 0.0
```

Figure 1: Location Setting of Emulator

4. High Level Design

This homework is a mobile app version of Homework 8. In this exercise, you will develop an Android application, which allows users to search for the event ticket, look at information about it, save some as favorites and post on Twitter about the event. You should reuse the Node.js backend service you developed in Homework 8 and follow the same API call requirements.

5. Implementation

5.1 Search Form

The initial interface is shown in Figure 2. There are two tabs in this interface: search and favorite.

For the search tab, it has the following fields:

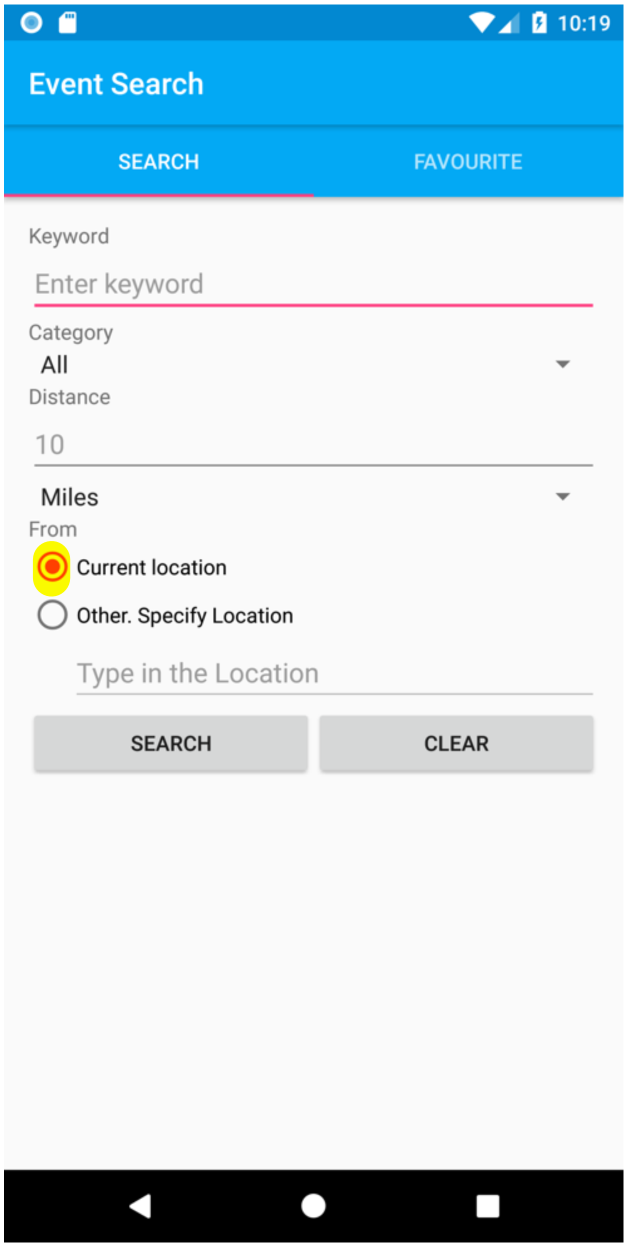


Figure 2: The Event Search App

- **Keyword**: An AutoCompleteTextView component allowing the user to enter the keyword. It provides the autocomplete function as shown in Figure 3. Make sure you use the same API as Homwork 8. See section 6.3.5 for hints.
- **Category**: A Spinner view allowing the user to choose a category. When the user taps on this field, a dropdown list should display for selecting a category, as shown in Figure 4. Make sure you include all the categories in homework 8.
- **Distance**: An EditText (type:number) view allowing the user to enter the distance and the default value is 10.
  A Spinner for the user to select unit: "miles" or "kilometers".
- **From**: Two Radio Buttons to select "Current Location" or "Other". You should get the location from your emulator for users that choose "Here". See section 6.2.
  An EditText component allowing the user to enter a location for "Other". The EditText should only be enabled when the corresponding Radio Button is checked.
- **Search**: A button to get the input information of each field, after validation. If the validation is successful, then the events would be fetched from the server. However, if the validation is unsuccessful, appropriate messages should be displayed and no further requests would be made to the server.
- **Clear:** A button to clear the input fields and reset them to default values when applicable. It should also remove any validation error messages.

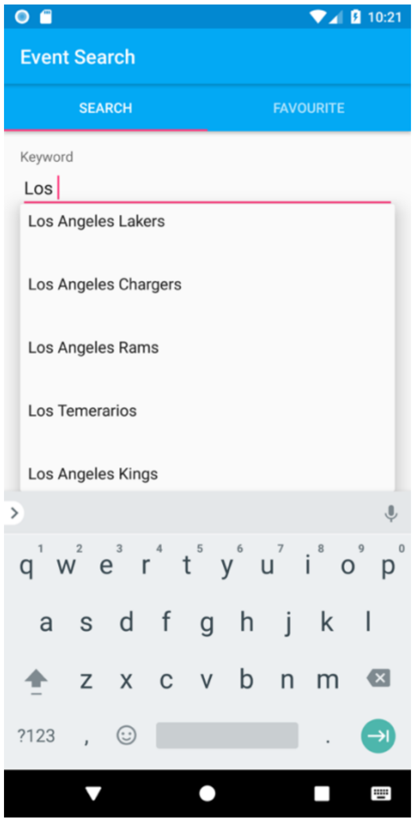


Figure 3: Autocomplete for keyword

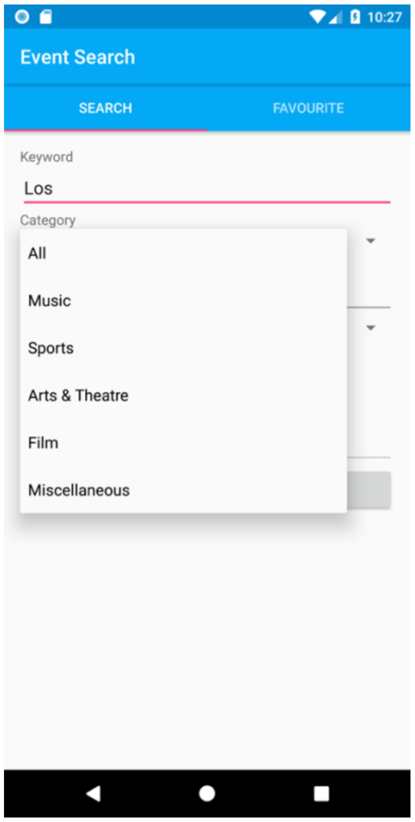
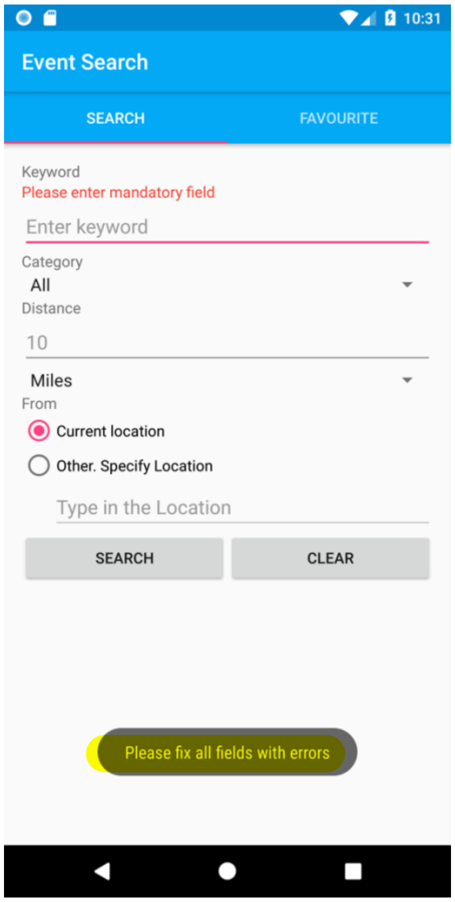


Figure 4: Category Spinner

The validation for an **empty keyword** has to be implemented. If the user does not enter anything in the EditText or just enters some empty spaces, when he/she presses the Search button you need to display an appropriate message to indicate the error, as shown in Figure 5. The same should be done when "**From**" location is not entered, and that option in enabled using the radio button as shown in Figure 6.



Please enter mandatory field

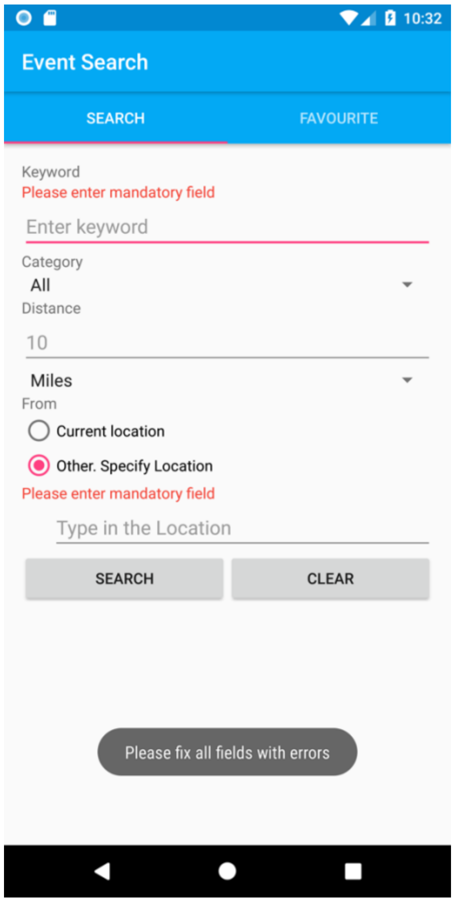
Category: All

Distance: 10 Miles

From: [✓ Current location] Other. Specify Location

Please fix all fields with errors

Figure 5: Validation error messages



Please enter mandatory field

Category: All

Distance: 10 Miles

From: Current location [✓ Other. Specify Location]

Please enter mandatory field

Please fix all fields with errors

Figure 6: Validation error messages

5.2 Search Results

When the user taps the SEARCH button and all validations pass, your app loads the search results page. Before you get the data from your backend server, a progress bar should display on the screen. After you get the data from your backend, hide the ProgressBar and display the result page as a list using RecyclerView or ListView, as shown in Figure 7. The RecyclerView or ListView must be scrollable. They also provide a 'back button' to navigate back the search/favorite interface.

Each of the item in the list should have the following:

- Category image (See the mapping between segment and icons on section 6. 1)
- Name of the event
- Name of the venue
- Date and Time of the event
- A heart-shaped "Favorite" button
  See homework 8 for more details about these fields.

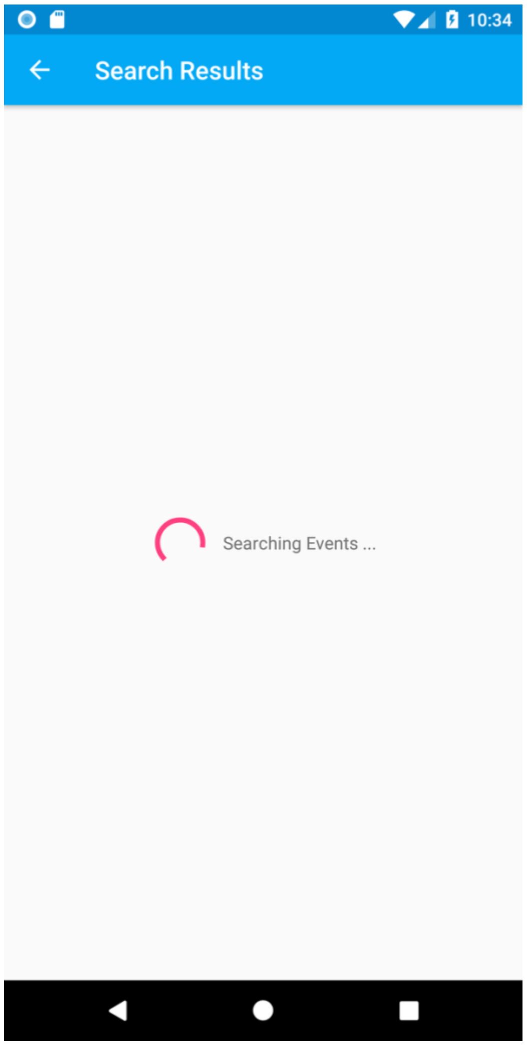
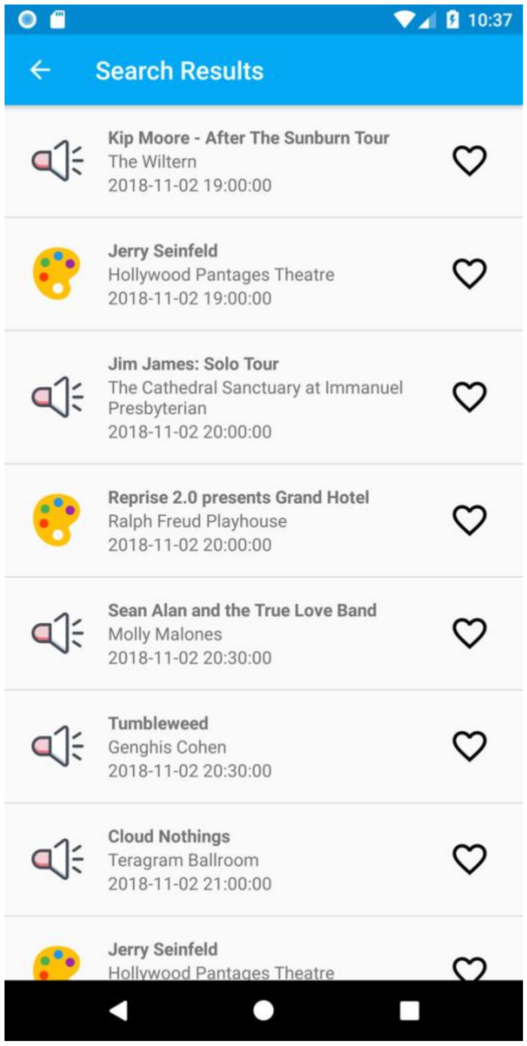


Figure 7: ProgressBar while fetching results


10:37

Search Results

Kip Moore - After The Sunburn Tour
The Wiltern
2018-11-02 19:00:00

Jerry Seinfeld
Hollywood Pantages Theatre
2018-11-02 19:00:00

Jim James: Solo Tour
The Cathedral Sanctuary at Immanuel Presbyterian
2018-11-02 20:00:00

Reprise 2.0 presents Grand Hotel
Ralph Freud Playhouse
2018-11-02 20:00:00

Sean Alan and the True Love Band
Molly Malones
2018-11-02 20:30:00

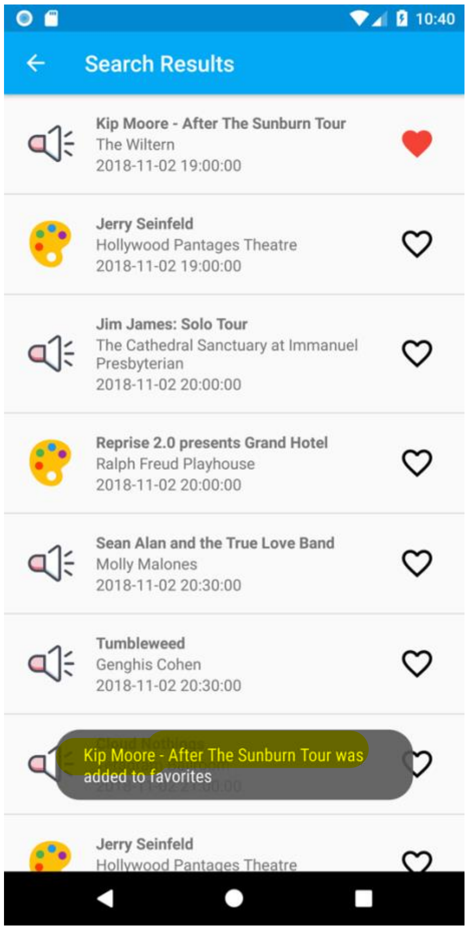
Tumbleweed
Genghis Cohen
2018-11-02 20:30:00

Cloud Nothings
Teragram Ballroom
2018-11-02 21:00:00

Jerry Seinfeld
Hollywood Pantages Theatre

Figure 8: List of search results

Tapping the favorite button (the heart) would add the corresponding event into the favorites list, and a message should be displayed at the bottom of the app using a Toast, as shown in Figure 9. Tapping the button again would remove that event from the favorites list, and a similar message should also be displayed to indicate the event has been removed from the favorites list, as shown in Figure 10.


10:40

Search Results

Kip Moore - After The Sunburn Tour
The Wiltern
2018-11-02 19:00:00

Jerry Seinfeld
Hollywood Pantages Theatre
2018-11-02 19:00:00

Jim James: Solo Tour
The Cathedral Sanctuary at Immanuel Presbyterian
2018-11-02 20:00:00

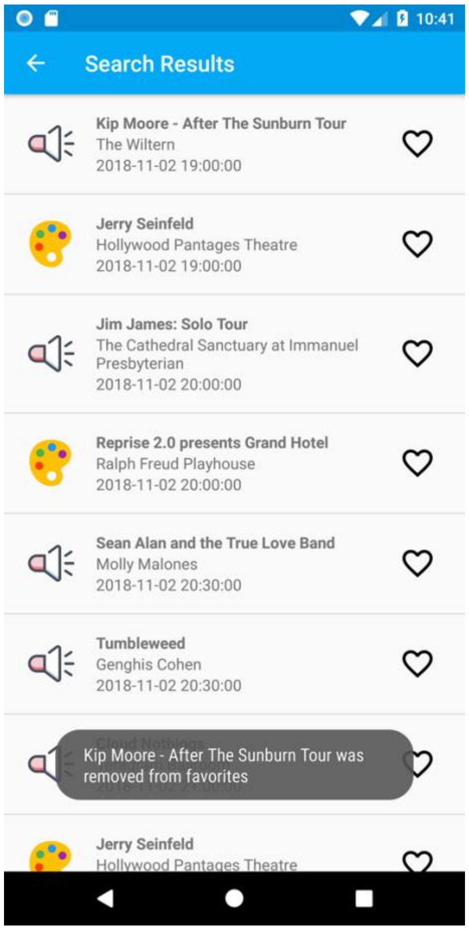
Reprise 2.0 presents Grand Hotel
Ralph Freud Playhouse
2018-11-02 20:00:00

Sean Alan and the True Love Band
Molly Malones
2018-11-02 20:30:00

Tumbleweed
Genghis Cohen
2018-11-02 20:30:00

Kip Moore - After The Sunburn Tour was added to favorites

Jerry Seinfeld
Hollywood Pantages Theatre


10:41

Search Results

Kip Moore - After The Sunburn Tour
The Wiltern
2018-11-02 19:00:00

Jerry Seinfeld
Hollywood Pantages Theatre
2018-11-02 19:00:00

Jim James: Solo Tour
The Cathedral Sanctuary at Immanuel Presbyterian
2018-11-02 20:00:00

Reprise 2.0 presents Grand Hotel
Ralph Freud Playhouse
2018-11-02 20:00:00

Sean Alan and the True Love Band
Molly Malones
2018-11-02 20:30:00

Tumbleweed
Genghis Cohen
2018-11-02 20:30:00

Kip Moore - After The Sunburn Tour was removed from favorites

Jerry Seinfeld
Hollywood Pantages Theatre

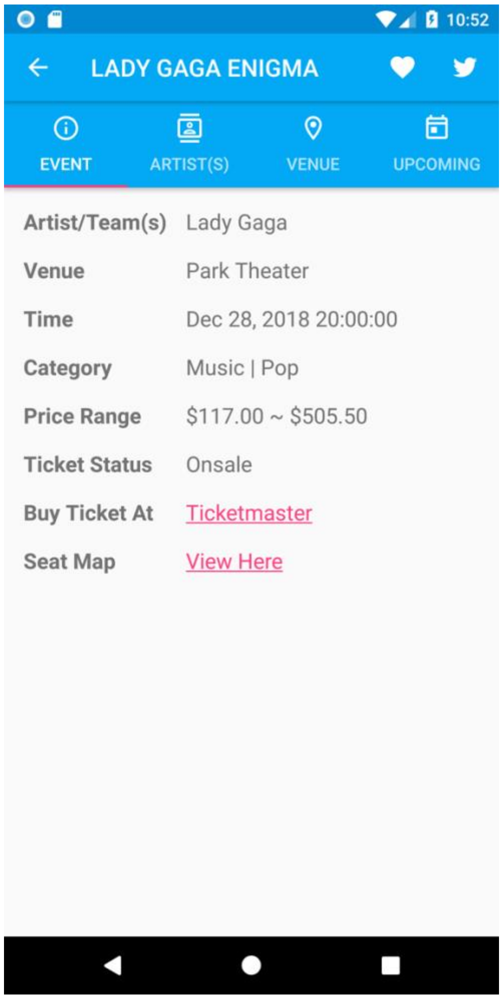
Figure 9: Message for adding favorites **Figure 10:** Message for removing favorites

5.3 Event Details

Tapping on an item in the result list should show details of that event with four tabs: Event, Artists, Venue and Upcoming. Note that the ProgressBar should be shown on each tab before you are ready to display the corresponding tab.

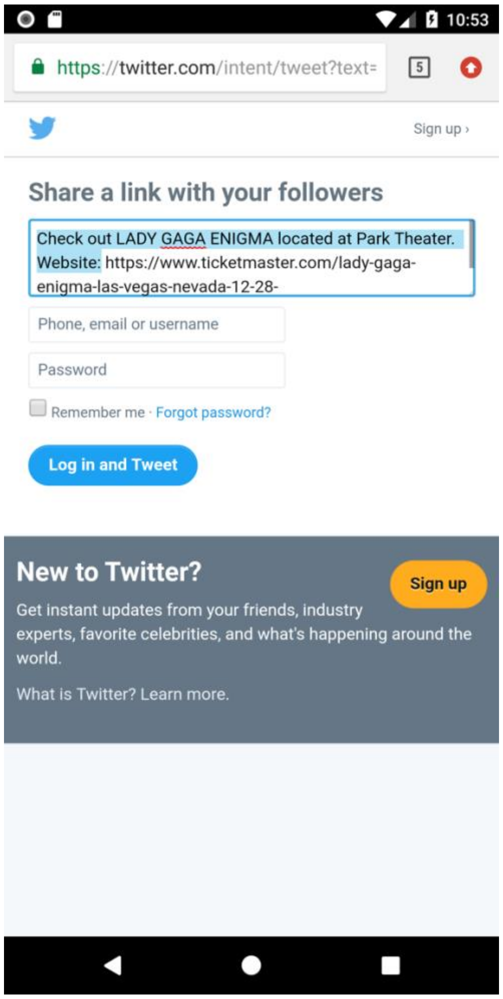
The tabs should be attached to the ActionBar and a ViewPager should be used to host all the tabs, as shown in Figure 11. Users should be able to switch between tabs by both swiping and tapping on a tab. The ActionBar should also include the following elements:

- A **back button,** which navigates back to the search results list.
- A **title,** which is the name of the event.
- A **favorite button** to add/remove the event to/from the favorite list, and display a Toast at the bottom of the screen. See video for more detail.
- A **twitter button**, to share the event details on Twitter. Once the button is tapped, a web page should open to allow the user to share the event information on Twitter, as shown in Figure 12. This should work the same as homework 8.



Artist/Team(s)	Lady Gaga
Venue	Park Theater
Time	Dec 28, 2018 20:00:00
Category	Music | Pop
Price Range	$117.00 ~ $505.50
Ticket Status	Onsale
Buy Ticket At	Ticketmaster
Seat Map	View Here

Figure 11: Event details



Share a link with your followers

Check out LADY GAGA ENIGMA located at Park Theater. Website: https://www.ticketmaster.com/lady-gaga-enigma-las-vegas-nevada-12-28-

New to Twitter?

Get instant updates from your friends, industry experts, favorite celebrities, and what's happening around the world.

What is Twitter? Learn more.

Figure 12: Share Event on Twitter

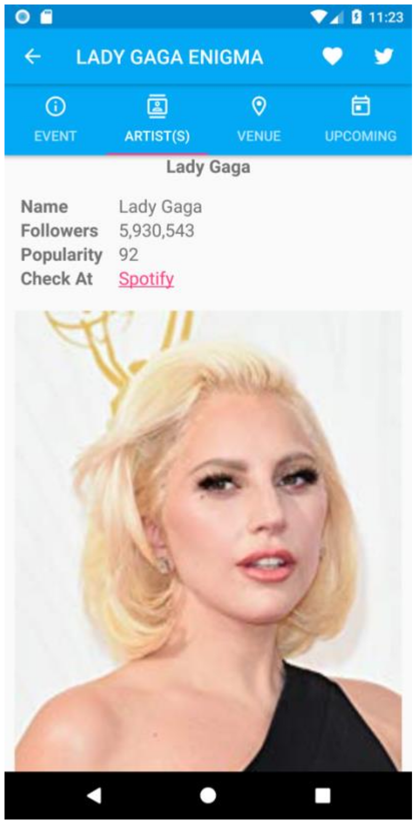
5.3.1 Event Tab

The fields in Figure 11 should be shown in the Event tab. See homework 8 for more details about each field. In homework 9, the seat map will be the URL of the image and when user click on this URL, it will go to the browser to show the seat map.

5.3.2 Artist(s) Tab

Same as in homework 8. But for multiple artists in homework #9, you could only show the **first two** artist's music profiles (if applicable) and corresponding photos (at most 8 photos for each artist/team). See Figure 13, Figure 14 and Figure 15.

You could use Volley Network ImageView, Picasso or Glide to load the image. See more on section 6.3.

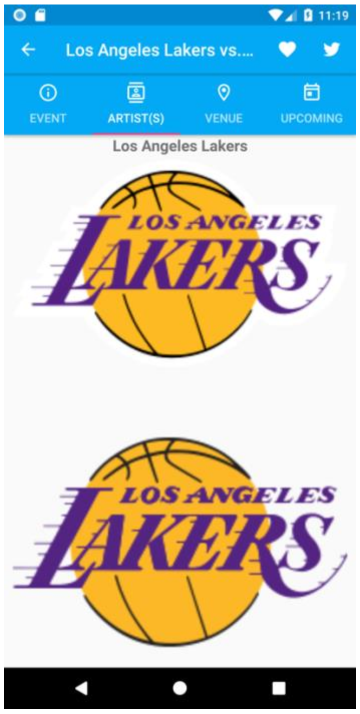

11:23

LADY GAGA ENIGMA

Lady Gaga

Name	Lady Gaga
Followers	5,930,543
Popularity	92
Check At	Spotify

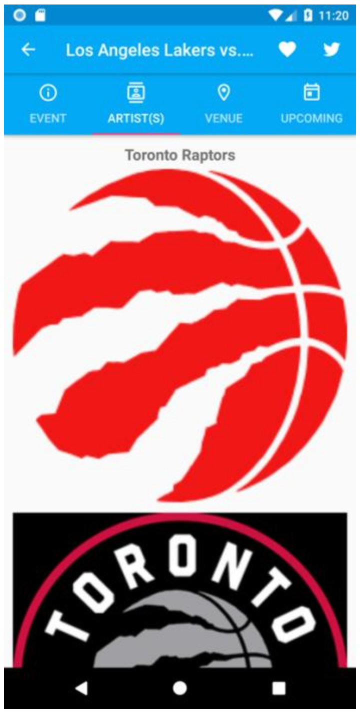
Figure 13: Artists Tab with Music Artist


11:19

Los Angeles Lakers vs....

Los Angeles Lakers

Figure 14: First Team Photos


11:20

Los Angeles Lakers vs....

Toronto Raptors

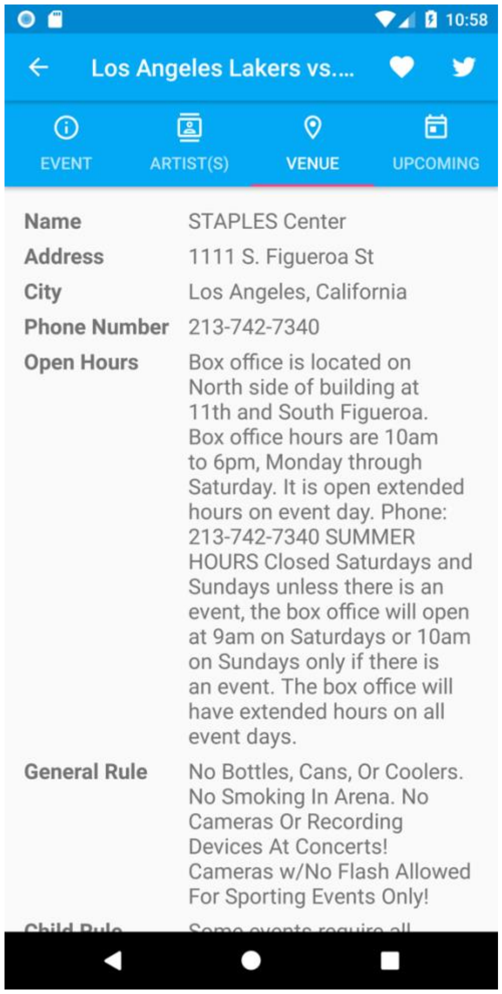
Figure 15: Second Team Photos

5.3.3 Venue Tab

As shown in Figure 16 and 17, there are two elements in this tab:

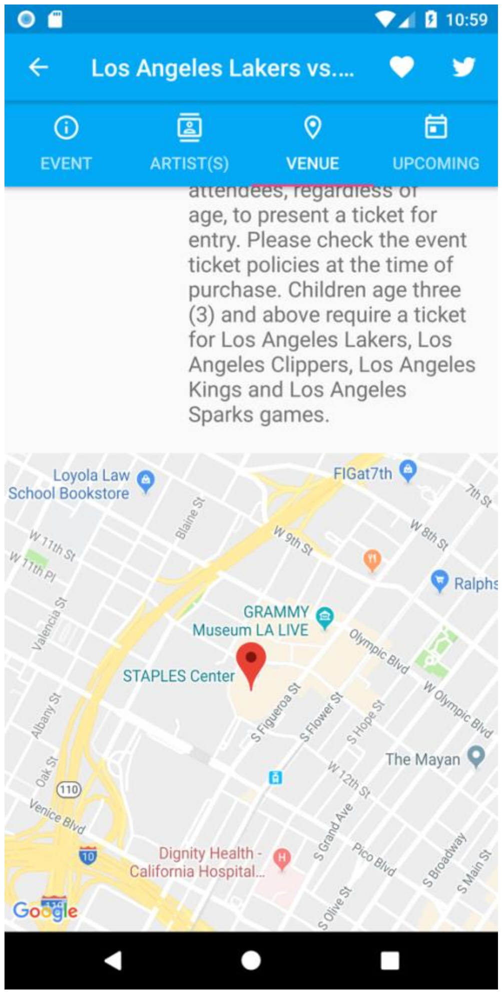
- **Details of the venue table:** Same as homework 8.
- **Map:** Same as homework 8, you should render a google map with a maker centered in the map of the venue location.
  The maps should be rendered using the Google Maps SDK for Android.
  https://developers.google.com/maps/documentation/android-api/

This view should be scrollable since the details of the venue table may be too long.



Name	STAPLES Center
Address	1111 S. Figueroa St
City	Los Angeles, California
Phone Number	213-742-7340
Open Hours	Box office is located on North side of building at 11th and South Figueroa. Box office hours are 10am to 6pm, Monday through Saturday. It is open extended hours on event day. Phone: 213-742-7340 SUMMER HOURS Closed Saturdays and Sundays unless there is an event, the box office will open at 9am on Saturdays or 10am on Sundays only if there is an event. The box office will have extended hours on all event days.
General Rule	No Bottles, Cans, Or Coolers. No Smoking In Arena. No Cameras Or Recording Devices At Concerts! Cameras w/No Flash Allowed For Sporting Events Only!
Child Rule	Some events require all

Figure 16: Venue Info



attendees, regardless of age, to present a ticket for entry. Please check the event ticket policies at the time of purchase. Children age three (3) and above require a ticket for Los Angeles Lakers, Los Angeles Clippers, Los Angeles Kings and Los Angeles Sparks games.

Figure 17: Venue map

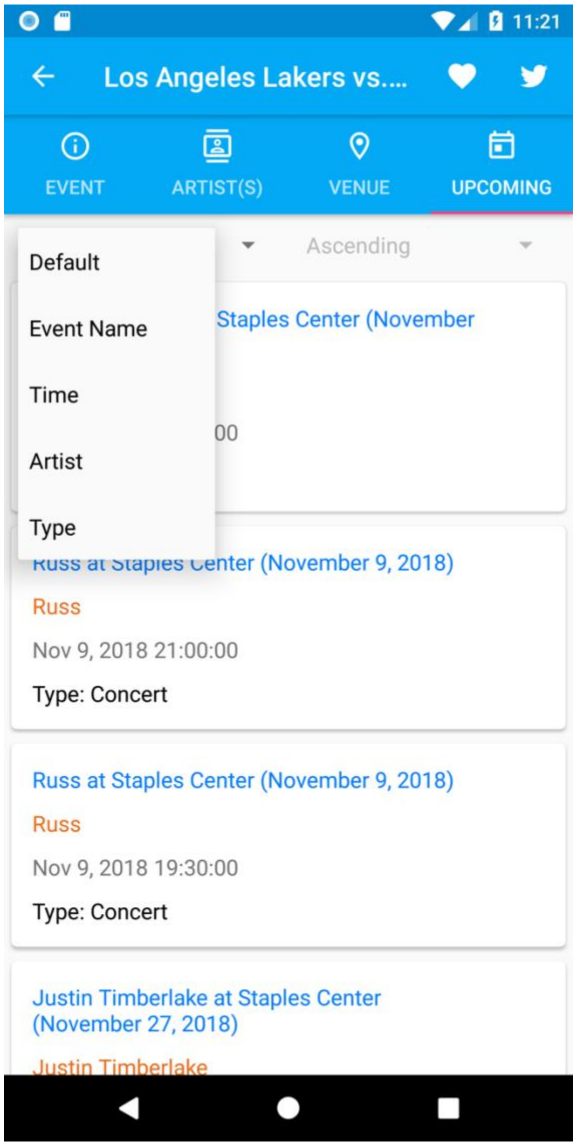
5.3.4 Upcoming Tab

This tab displays the upcoming events of the venue, same as homework 8. Please note, in homework #9, you need to get **at most 5 (first 5)** upcoming events from your NodeJS server.

As shown in Figure 18 and 19, you should use two Spinners to switch sort base and also its order. One Spinner allow users to sort the upcoming events by default order, event name, time, artist and type. Another provides the sort in ascending or descending order. When “Default” is selected, the Ascending or Descending should be disabled.

The upcoming events are shown in a list using a RecyclerView. Note that each of the cells can be tapped and then a web page should be opened and navigates to the tapped upcoming events, see video for more detail and Figure 20.

In the case of no upcoming data, show "no records" in the center of the screen, as shown in Figure 21.



Staples Center (November

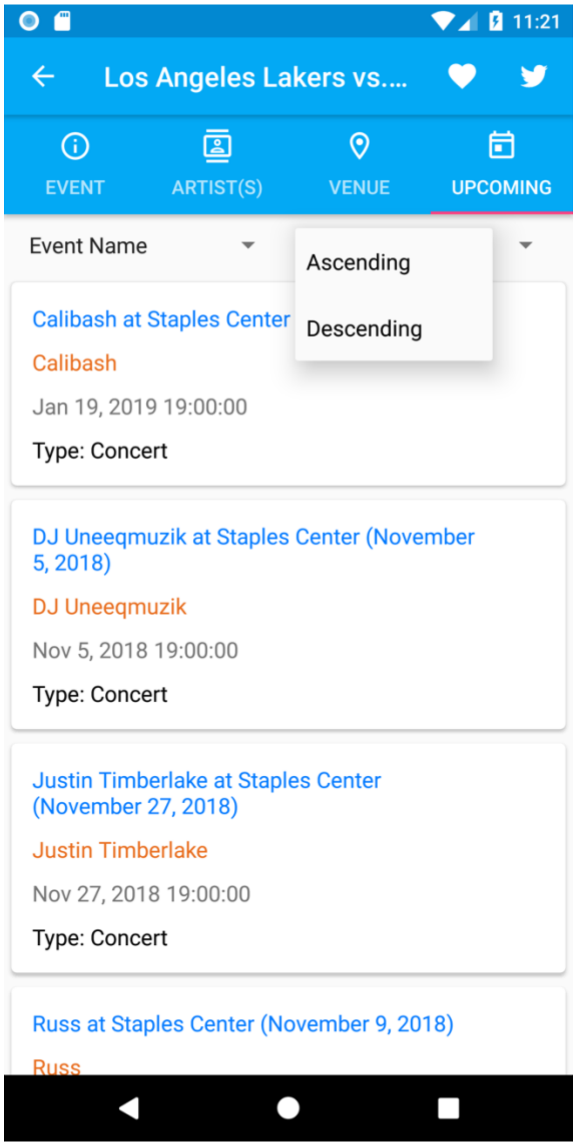
00

Russ at Staples Center (November 9, 2018)
Russ
Nov 9, 2018 21:00:00
Type: Concert

Russ at Staples Center (November 9, 2018)
Russ
Nov 9, 2018 19:30:00
Type: Concert

Justin Timberlake at Staples Center (November 27, 2018)
Justin Timberlake

Figure 18: Sort by spinner



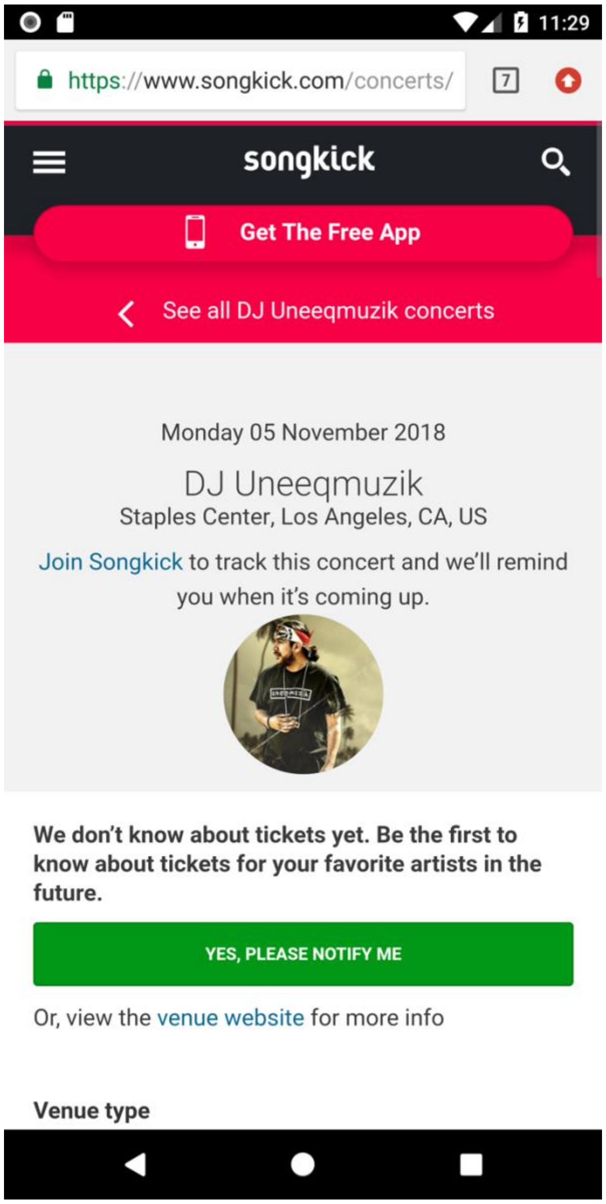
Calibash at Staples Center
Calibash
Jan 19, 2019 19:00:00
Type: Concert

DJ Uneeqmuzik at Staples Center (November 5, 2018)
DJ Uneeqmuzik
Nov 5, 2018 19:00:00
Type: Concert

Justin Timberlake at Staples Center (November 27, 2018)
Justin Timberlake
Nov 27, 2018 19:00:00
Type: Concert

Russ at Staples Center (November 9, 2018)
Russ

Figure 19: Order Spinner


11:29
https://www.songkick.com/concerts/
songkick
Get The Free App
See all DJ Uneeqmuzik concerts

Monday 05 November 2018

DJ Uneeqmuzik

Staples Center, Los Angeles, CA, US

Join Songkick to track this concert and we'll remind you when it's coming up.

We don't know about tickets yet. Be the first to know about tickets for your favorite artists in the future.

YES, PLEASE NOTIFY ME

Or, view the venue website for more info

Venue type

Figure 20: Webpage for the Songkick event

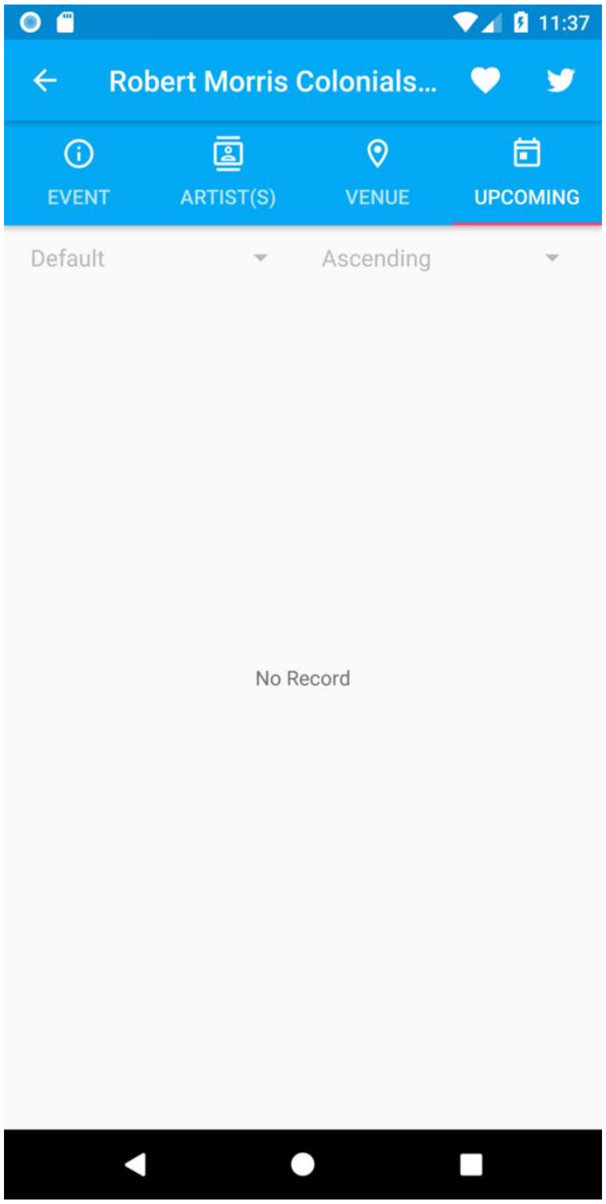
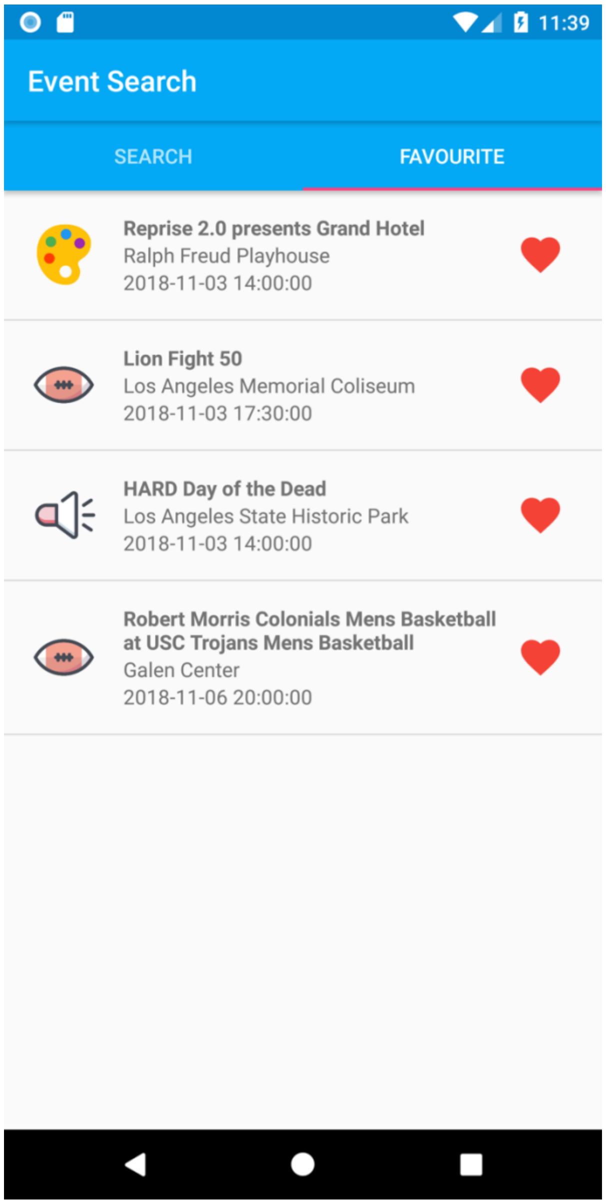


Figure 21: No Record

5.4 Favorite list

Use Tabs with a ViewPager on the main screen to switch between the search page and the favorite page. The favorite events should be displayed in a list using a RecyclerView/ListView. Each of the items in the list includes an event catalog image, event name, venue name and time, as shown in Figure 22. If there are no favorite events, "No Favorites" should be displayed at the center of the screen, as shown in Figure 23.

Like in search results, pressing the favorite icon here should remove the event from the favorites list. See video for more detail.



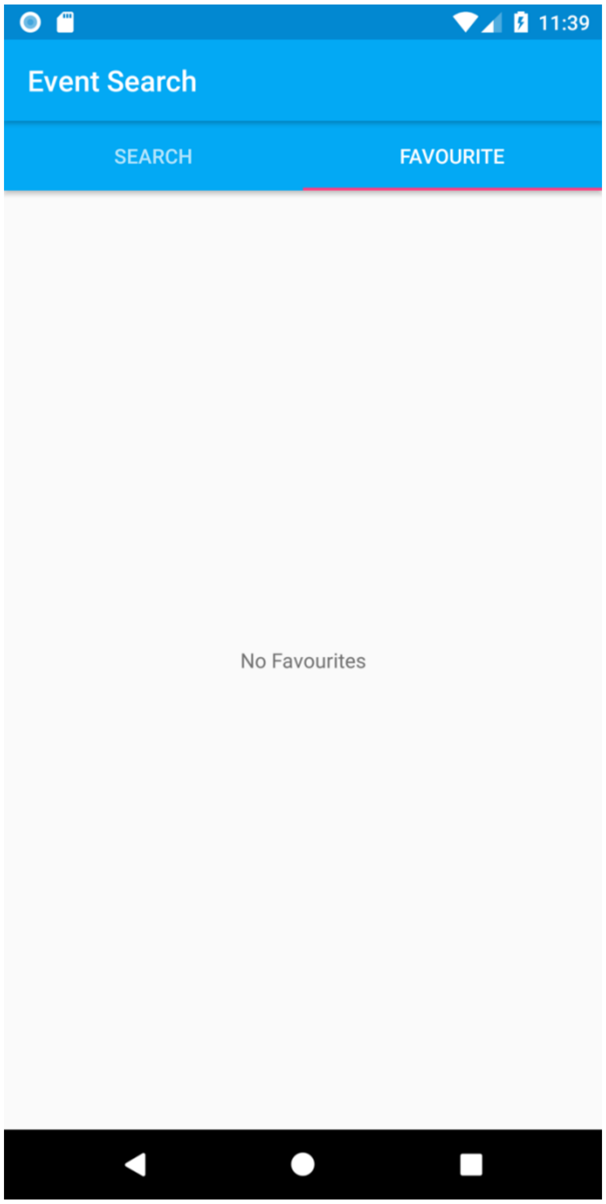
Reprise 2.0 presents Grand Hotel
Ralph Freud Playhouse
2018-11-03 14:00:00

Lion Fight 50
Los Angeles Memorial Coliseum
2018-11-03 17:30:00

HARD Day of the Dead
Los Angeles State Historic Park
2018-11-03 14:00:00

Robert Morris Colonials Mens Basketball at USC Trojans Mens Basketball
Galen Center
2018-11-06 20:00:00

Figure 22: Favorite list



No Favourites

Figure 23: No favorites

5.5 Error handling

If no events are found given a keyword, a “no results” should be displayed, as shown in Figure 24.
If for any reason an error occurs (no network, API failure, cannot get location etc.), an appropriate error messages should be displayed at the bottom of screen using a Toast.

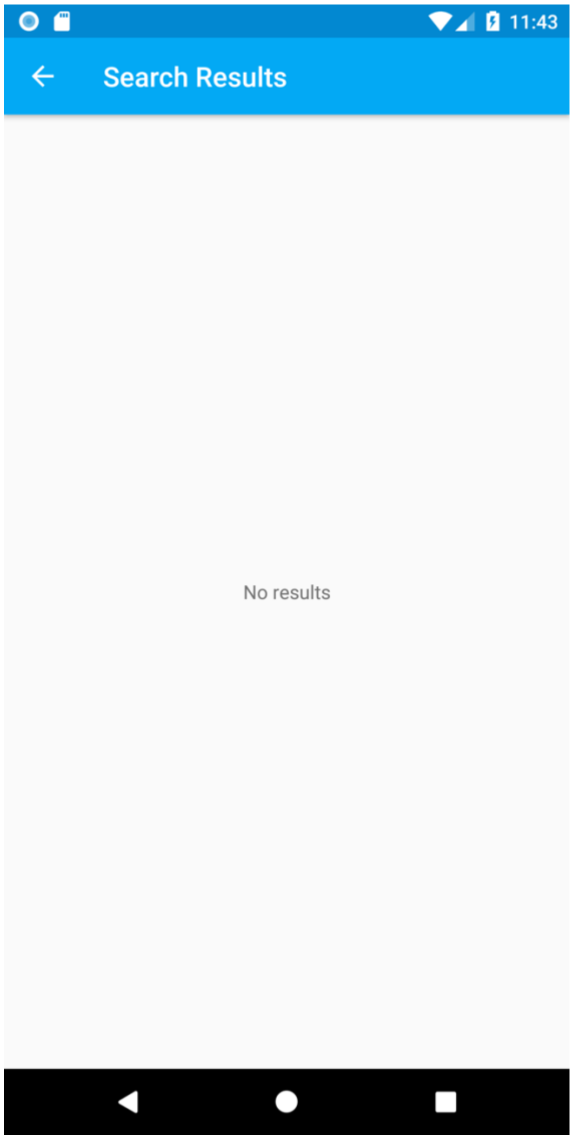


Figure 24: No search results

5.6 Additional

For things not specified in the document, grading guideline, or the video, you can make your own decisions. But keep in mind about the following points:

- Always display a proper message and don't crash if an error happens.
- Always display a loading message if the data is loading.
- You can only make HTTP requests to your backend Node.js on AWS/GAE/Azure and use the Google Map SDK for Android.
- All HTTP requests should be asynchronous and should not block the main UI thread. You can use third party libraries like Volley to achieve this in a simple manner.

6. Implementation Hints

6.1 Images

The images needed for the homework as provided as vector drawables and are available here:

Favorites

http://csci571.com/hw/hw9/images/android/heart_fill_red.xml
http://csci571.com/hw/hw9/images/android/heart_fill_white.xml
http://csci571.com/hw/hw9/images/android/heart_outline_black.xml
http://csci571.com/hw/hw9/images/android/heart_outline_white.xml

Categories Icons:

Music:	http://csci571.com/hw/hw9/images/android/music_icon.png
Sports:	http://csci571.com/hw/hw9/images/android/sport_icon.png
Arts & Theatre:	http://csci571.com/hw/hw9/images/android/art_icon.png
Miscellaneous:	http://csci571.com/hw/hw9/images/android/miscellaneous_icon.png
Film:	http://csci571.com/hw/hw9/images/android/film_icon.png

Tab Icons

Event Tab:	http://csci571.com/hw/hw9/images/android/info_outline.xml
Artists Tab:	http://csci571.com/hw/hw9/images/android/artist.xml
Venue Tab:	http://csci571.com/hw/hw9/images/android/venue.xml
Upcoming Tab:	http://csci571.com/hw/hw9/images/android/upcoming.xml

Twitter : http://csci571.com/hw/hw9/images/android/twitter_ic.png

6.2 Getting current location

For your location fetching code to work, you must request the permission from the user. You can read more about requesting permissions here:
https://developer.android.com/training/permissions/requesting.html

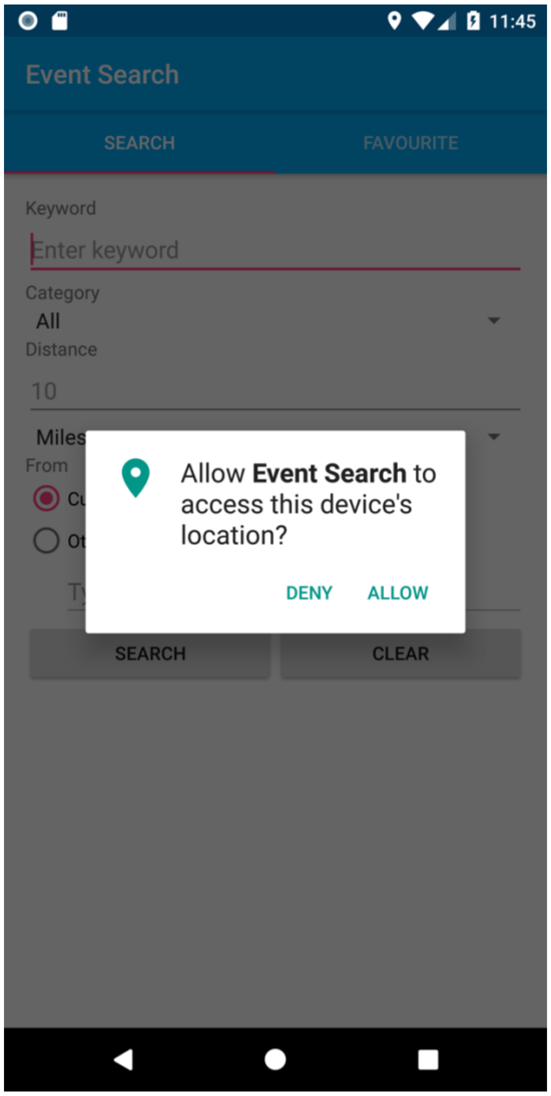


Figure 22: Requesting location permission

You may need to mock the location in your emulator. This can be done from the emulator settings.

6.3 Third party libraries

Almost all functionalities of the app can be implemented without using third party libraries, but sometimes using them can make your implementation much easier and quicker. Some libraries you may have to use are:

6.3.1 Google Play services

You will need this for various features like getting the current location and using Google Maps in your app.

You can learn about setting it up here:
https://developers.google.com/android/guides/setup

6.3.2 Volley HTTP requests

Volley can be helpful with asynchronously http request to load data. You can also use Volley network ImageView to load photos in artist tab. You can learn more about them here:

https://developer.android.com/training/volley/index.html

6.3.3 Picasso

Picasso is a powerful image downloading and caching library for Android.
http://square.github.io/picasso/

If you decide to use RecycleView to display the photos with Picasso Please use version 2.5.2 since latest version does not support RecycleView well.
https://github.com/codepath/android_guides/wiki/Displaying-Images-with-the-Picasso-Library

6.3.4 Glide

Glide is also powerful image downloading and caching library for Android. It is similar to Picasso. You can also use Glide to load photos in artist tab.
https://bumptech.github.io/glide/

6.3.5 Working with the AutoCompleteTextView

Working with the AutoCompleteTextView to show the suggestions might be a little challenging. This tutorial goes over how it is done so that you get an idea of how to go about it.
https://www.truiton.com/2018/06/android-autocompletetextview-suggestions-from-webservice-call/

7. What to Upload to GiHub Classroom

You should also ZIP all your source code (the java/ and res/ directories excluding the vector drawables that we provide to you) and submit the resulting ZIP file by the end of the demo day.

Unlike other exercises, you will have to demo your submission **in person** during a special grading session. Details and logistics for the demo will be provided in class, on the Announcement page and on Piazza. **Demo is done an a laptop/ notebook/MacBook using the emulator, and not a physical mobile device.**

****IMPORTANT****

All videos are part of the homework description. All discussions and explanations on Piazza related to this homework are part of the homework description and will be accounted into grading. So please review all Piazza threads before finishing the assignment.