Homework 9: FB Search

1. Objectives

- Become familiar with Android Studio, Android App development for Android.
- Build a good-looking Android app using the Android SDK.
- Build mobile user experience for Facebook Search using the Facebook Graph API
- Add social networking features using the Facebook SDK for Android

2. Background

2.1 Android Studio

Android Studio is the official IDE for Android application development, based on IntelliJ IDEA (https://www.jetbrains.com/idea/). 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

The home page of the Android Studio is located 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 December 2013, Android was the number 1 mobile OS, in unit sales, surpassing iOS, while iOS was still the most profitable platform.

The Android operating system software stack consists of Java applications running on a Java based object oriented application framework on top of Java core libraries running on the Dalvik virtual machine featuring JIT compilation.

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/index.html

2.4 Facebook Graph API

The Graph API is the primary way to get data out of, and put date into Facebook's platform. It's a lowlevel HTTP-based API that you can use to programmatically query data, post new stories, manage ads, upload photos, and perform a variety of other tasks that an app might implement. To learn more about the Facebook Graph API visit:

https://developers.facebook.com/docs/graph-api

2.5 Amazon Web Services (AWS)

AWS is Amazon's implementation of cloud computing. Included in AWS is Amazon Elastic Compute Cloud (EC2), which delivers scalable, pay-as-you-go compute capacity in the cloud, and AWS Elastic Beanstalk, an even easier way to quickly deploy and manage applications in the AWS cloud. You simply upload your application, and Elastic Beanstalk automatically handles the deployment details of capacity provisioning, load balancing, auto-scaling, and application health monitoring. Elastic Beanstalk is built using familiar software stacks such as the Apache HTTP Server, PHP, and Python, Passenger for Ruby, IIS 7.5 for .NET, and Apache Tomcat for Java.

The Amazon Web Services homepage is available at: http://aws.amazon.com/

2.6 Google App Engine (GAE)

Google App Engine applications are easy to create, easy to maintain, and easy to scale as your traffic and data storage needs change. With App Engine, there are no servers to maintain. You simply upload your application and it's ready to go. App Engine applications automatically scale based on incoming traffic. Load balancing, micro services, authorization, SQL and noSQL databases, memcache, traffic splitting, logging, search, versioning, roll out and roll backs, and security scanning are all supported natively and are highly customizable.

To learn more about GAE support for PHP visit the page:

https://cloud.google.com/appengine/docs/php/

3. Prerequisites

This homework requires the use of the following components:

A. Download and install Android Studio. You may use any other IDE other than Android Studio such as Eclipse, but you will be on your own if problems spring up.
B. First you need to install Java on your local machine. You can download JDK 8 from - http://www.oracle.com/technetwork/java/javase/downloads/index.html. For

windows users, after installing the JDK, you need to add environment variables for JDK.

- Properties -> Advanced -> Environment Variables -> System variables -> New Variable

  Name: JAVA_HOME, Variable Value: <Full path to the JDK>

- Typically, this full path looks something like C:\Program Files\Java\jdk1.8.0.

  Then modify the PATH variable as follows on Microsoft Windows:
  C:\WINDOWS\system32;C:\WINDOWS;C:\Program Files\Java\jdk1.8.0\bin
  This path may vary depending on your installation.

- Note: The PATH environment variable is a series of directories separated by semicolons (;) and is not case-sensitive. Microsoft Windows looks for programs in the PATH directories in order, from left to right. You should only have one bin directory for a JDK in the path at a time. Those following the first instance are ignored. If you are not sure where to add the path, add it to the right of the value of the PATH variable. The new path takes effect in each new command window you open after setting the PATH variable.

- Reboot your computer and type "java -version" in the terminal to see whether your JDK has been installed correctly.

Set up the Android Studio environment so that you can run any sample android app on your phone/tablet/virtual device from it. Then you can start with this homework app. You will need to enable "Developer Options" and "USB debugging" if you are using an actual device. There are endless resources a simple search away on how to setup your Android Studio.

4. High Level Design

In this exercise, you will develop an Android Mobile application, which will have following functionality:

There will be a slide out-menu which will provide access to the different screens such as Home, Favorites and About Me. The content displayed in each of these sections will be similar to Homework 8 but we will go into details later on.

The initial screen would default to showing the home screen as shown below.

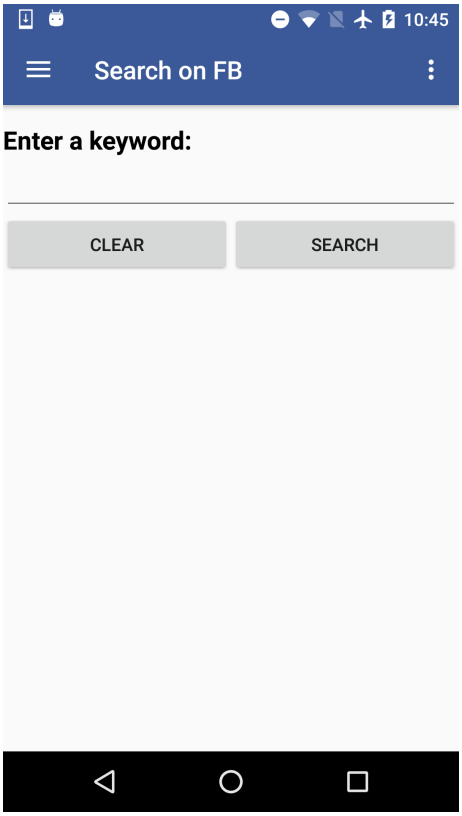


Figure 1. Initial Screen

The slide-out menu should open upon tapping the hamburger icon. Please refer the below screenshot for the menu design. The menu would close on tapping on the menu button.

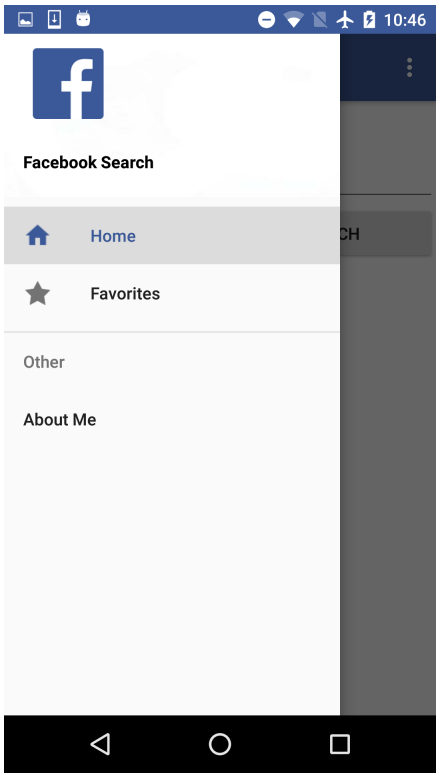


Figure 2. Slide-out Menu

5. Implementation

5.1 Home screen

You must replicate the Home Screen, as shown in Figure 1.

The interface consists of the following:

- A 'TextView' to allow the user to enter the search query.
- 2 'Button' for clearing and submitting the query.
- A component to show the navigation bar that has the hamburger menu icon to show the slide-out menu.

The 'Search' button should submit the search query and move to the next screen showing the search results. Please note that it should display the message in case of an empty text field and avoid going to the next screen.

The ‘Clear’ button should clear the text field’s content.

The hamburger menu icon should show the slide-out menu, which should be dismissed upon clicking the menu icon again.

5.2 Search Results

On submitting the query, the screen should move to display the results in 5 different tabs as shown below:

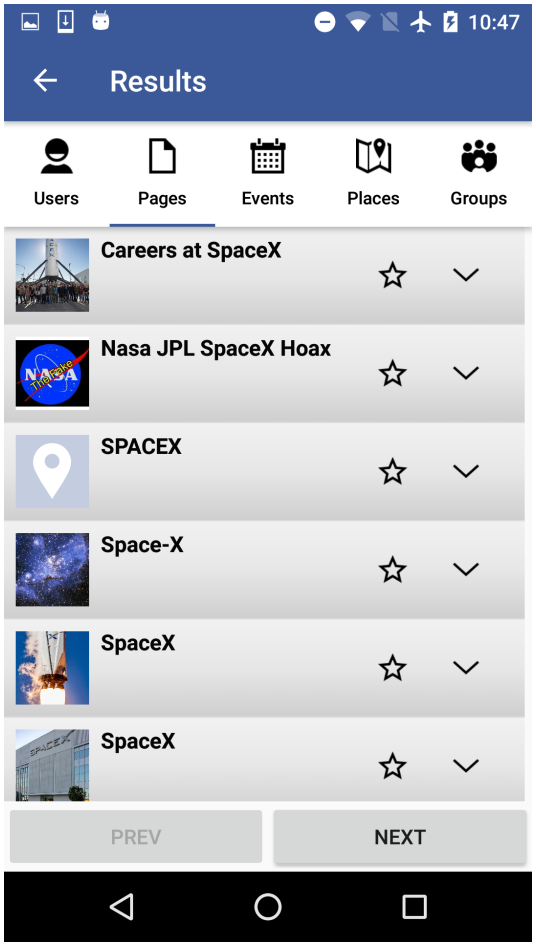


Figure 3: Search Results

The search results would display the results in 5 tabs for the following types, like in Homework 8:

- User
- Page
- Event
- Place
- Group

Please note that the search result would show the user tab, by default.

5.2.1 User Tab

The user tab would display the search result for the type – 'user'. The screen consists of the following:

1. 'ListView' to show the users corresponding to the search query.
2. 2 'Button' for pagination
3. The navigation bar to display back button to go back to home screen

Each row in the table would contain the following:

1. Icon – An 'ImageView' component for the icon of the user
2. Name – A 'TextView' component for the name of the user
3. Favorite – 'ImageView' component indicating whether the user has been marked as favorite
4. Detail Disclosure – Use the 'ImageView' component to handle click action for user's detail described in the user detail screen next.

Pagination

There are 2 buttons at the bottom of the screen to navigate among the search results. The 'Previous' button and 'Next' button should only be enabled, if applicable.

Within the screen, you need to display 10 rows to show the first 10 users. The user can then use the next and previous button to view more users.

5.2.2 Pages Tab

The page tab would display the search result for the type – 'page'. The screen consists of the following:

1. 'ListView' to show the pages corresponding to the search query.
2. 2 'Button' for pagination
3. The navigation bar to display back button to go back to home screen

Each row in the table would contain the following:

1. Icon – An 'ImageView' component for the icon of the page
2. Name – A 'TextView' component for the name of the page
3. Favorite – 'ImageView' component indicating whether the page has been marked as favorite
4. Detail Disclosure – Use the 'ImageView' component to handle click action for page's detail described in the page detail screen next.

Pagination

There are 2 buttons at the bottom of the screen to navigate among the search results. The 'Previous' button and 'Next' button should only be enabled, if applicable.

Within the screen, you need to display 10 rows to show the first 10 pages. The page can then use the next and previous button to view more pages.

5.2.3 Events Tab

The event tab would display the search result for the type – 'event'. The screen consists of the following:

1. 'ListView' to show the events corresponding to the search query.
2. 2 'Button' for pagination
3. The navigation bar to display back button to go back to home screen

Each row in the table would contain the following:

1. Icon – An 'ImageView' component for the icon of the event
2. Name – A 'TextView' component for the name of the event
3. Favorite – 'ImageView' component indicating whether the event has been marked as favorite
4. Detail Disclosure – Use the 'ImageView' component to handle click action for event's detail described in the event detail screen next.

Pagination

There are 2 buttons at the bottom of the screen to navigate among the search results. The 'Previous' button and 'Next' button should only be enabled, if applicable.

Within the screen, you need to display 10 rows to show the first 10 events. The event can then use the next and previous button to view more events.

5.2.4 Place Tab

The place tab would display the search result for the type – 'place'. The screen consists of the following:

1. 'ListView' to show the places corresponding to the search query.
2. 2 'Button' for pagination
3. The navigation bar to display back button to go back to home screen

Each row in the table would contain the following:

1. Icon – An 'ImageView' component for the icon of the place
2. Name – A 'TextView' component for the name of the place
3. Favorite – 'ImageView' component indicating whether the place has been marked as favorite
4. Detail Disclosure – Use the 'ImageView' component to handle click action for place's detail described in the place detail screen next.

Please note that you get the user's current location to passed to the API for the parameter center.

Pagination

There are 2 buttons at the bottom of the screen to navigate among the search results. The 'Previous' button and 'Next' button should only be enabled, if applicable.

Within the screen, you need to display 10 rows to show the first 10 places. The place can then use the next and previous button to view more places.

5.2.5 Group Tab

The page tab would display the search result for the type – 'page'. The screen consists of the following:

1. 'ListView' to show the pages corresponding to the search query.
2. 2 'Button' for pagination
3. The navigation bar to display back button to go back to home screen

Each row in the table would contain the following:

1. Icon – An 'ImageView' component for the icon of the page
2. Name – A 'TextView' component for the name of the page
3. Favorite – 'ImageView' component indicating whether the page has been marked as favorite
4. Detail Disclosure – Use the 'ImageView' component to handle click action for page's detail described in the page detail screen next.

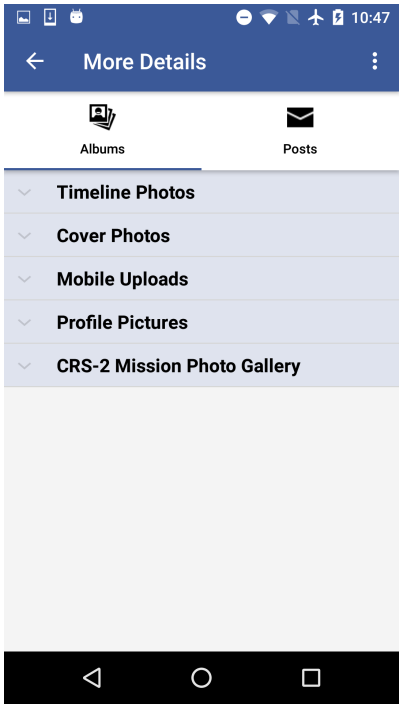
Pagination
There are 2 buttons at the bottom of the screen to navigate among the search results. The 'Previous' button and 'Next' button should only be enabled, if applicable.

Within the screen, you need to display 10 rows to show the first 10 pages. The page can then use the next and previous button to view more pages.

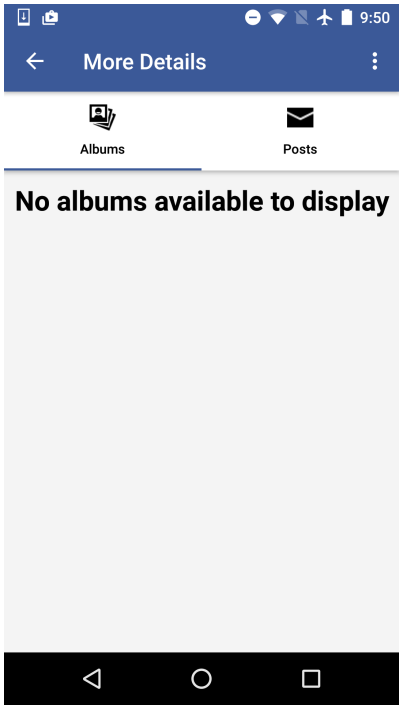
5.3.1 User Detail

Tapping any of the table row, should move to the user details to show the user's albums and posts, if any. The user detail screen contains two tabs for 'Albums' and 'Posts'. By default, the albums tab should be shown.

Please consider the following screenshot for reference.



Album data available

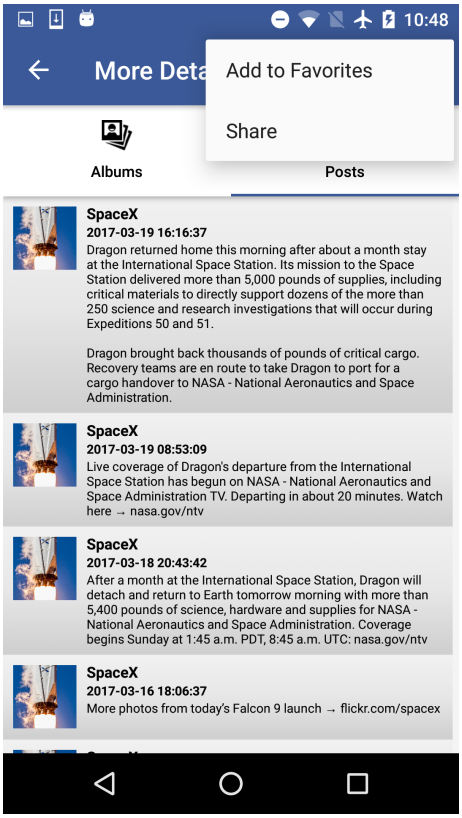


Album data unavailable

The albums tab should display the 5 albums, if available within the 'ExpandableListView' component. Also note that the cell should be collapsed by default. However, if no album data is found, just show a 'TextView' component showing an appropriate message.

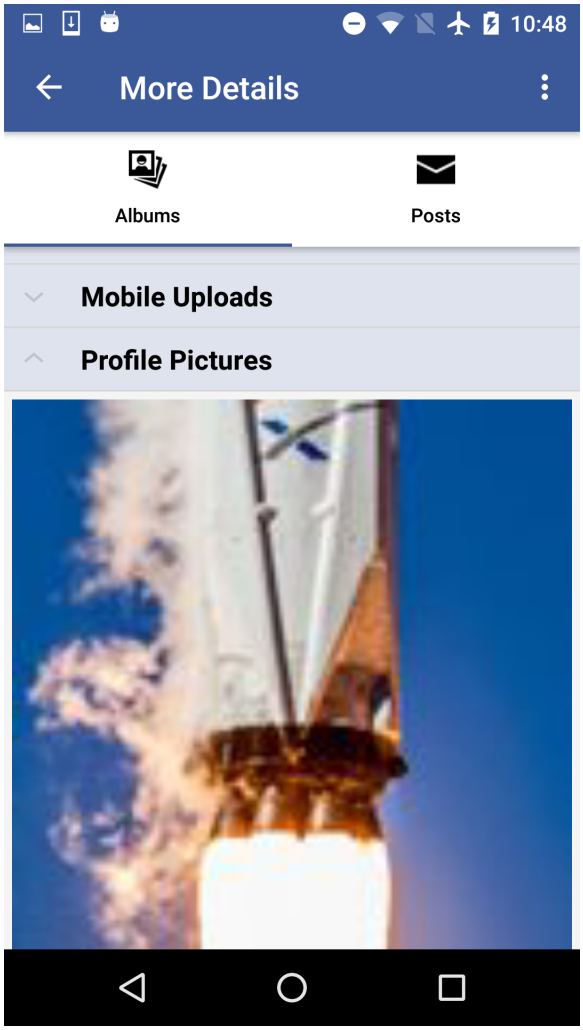
The user detail screen also contains the option menu option in the navigation bar. It would allow to mark the user as a favorite as well as share the user on Facebook. It would bring up the menu to show the two options – Favorite and Share. Please refer the below screenshot for reference.

Please note that the text can be 'Add to favorites' or 'Remove from favorite' depending whether the user has already been added to favorite or not. Also note that marking the user as a favorite or removing the user from favorite should display an appropriate message.



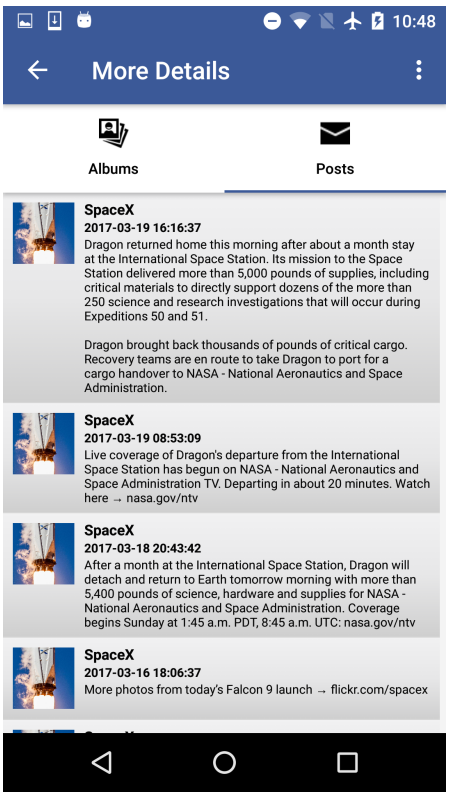
Thereon, the user can also share the user on Facebook. Please refer the Facebook Share section for reference.

On tapping an any of the 5 albums, the row should expand to show the 2 images within the concerned albums, as shown below. Furthermore, note that the upon tapping any other albums, the previously expanded album should collapse, if any. Also, upon tapping the expanded cell, the album should again collapse.

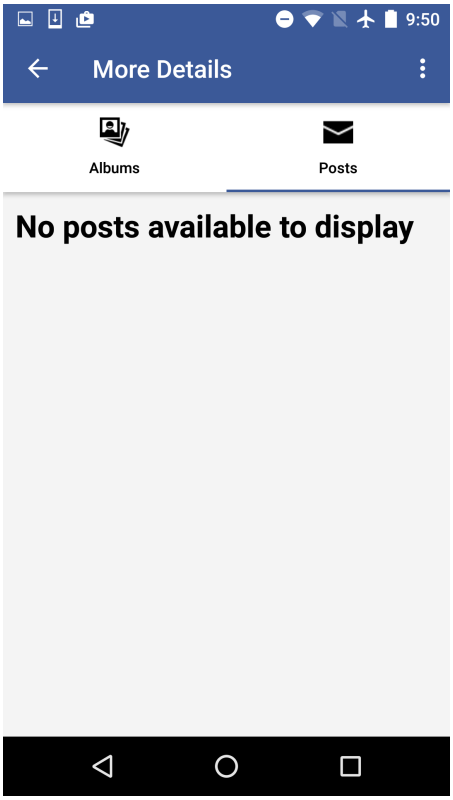


The posts tab should display the 5 posts, if available, within the ‘ListView’ component.

Please note that each row of the table, should display the user’s icon, the content of the post along with the formatted date.



Post data available



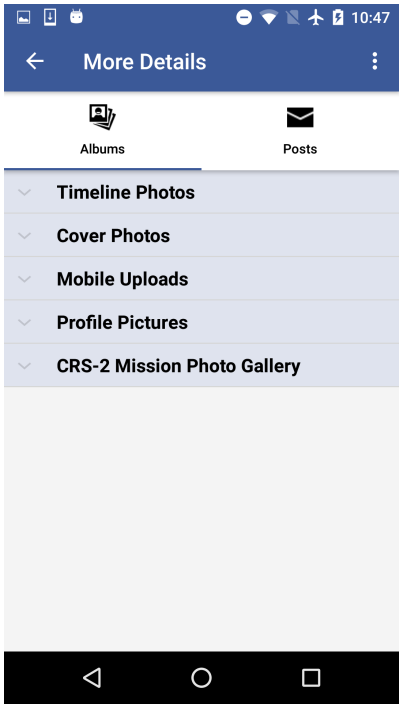
Post data unavailable

Please note that the back button should take you back to the search results screen on the 'User' tab.

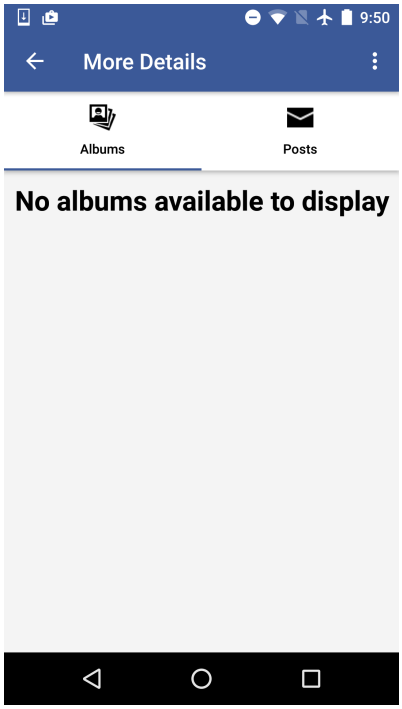
5.3.2 Page Detail

Tapping any of the table row, should move to the page details to show the page's albums and posts, if any. The page detail screen contains two tabs for 'Albums' and 'Posts'. By default, the albums tab should be shown.

Please consider the following screenshot for reference.



Album data available

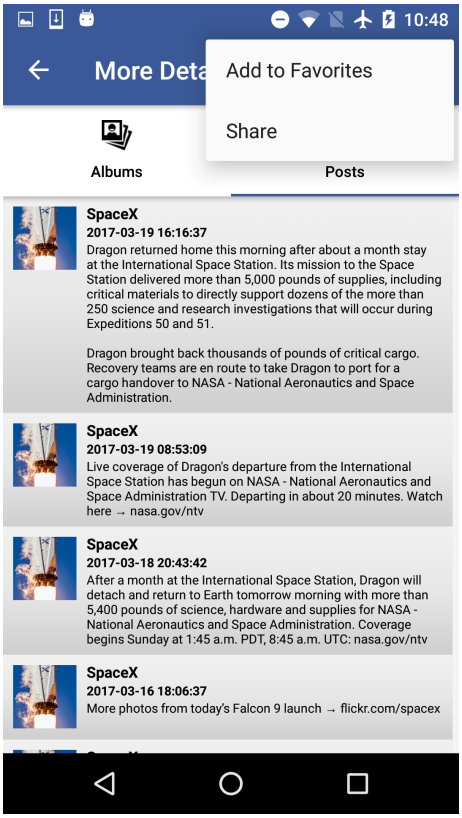


Album data unavailable

The albums tab should display the 5 albums, if available within the 'ExpandableListView' component. Also note that the cell should be collapsed by default. However, if no album data is found, just show a 'TextView' component showing an appropriate message.

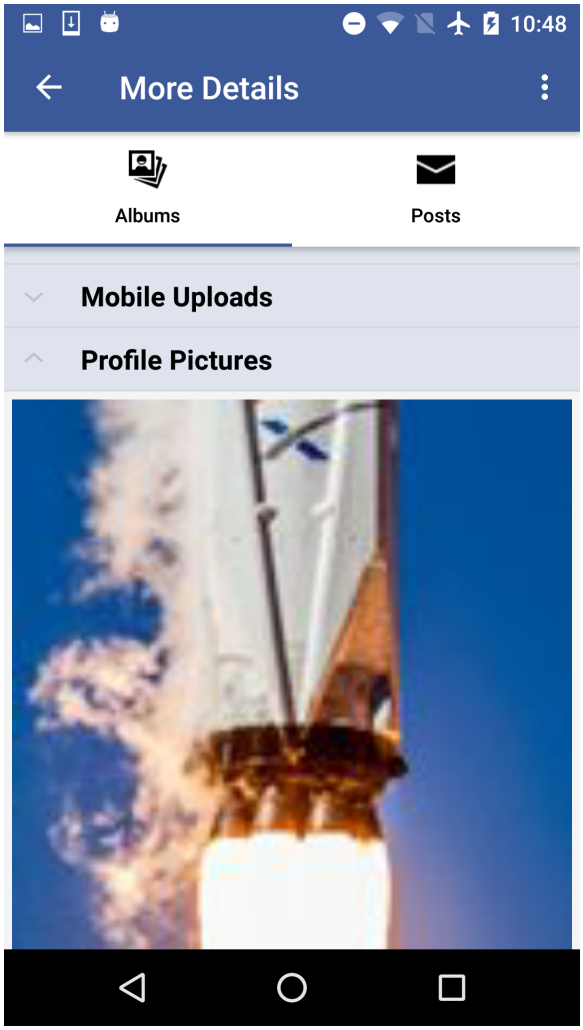
The page detail screen also contains the option menu option in the navigation bar. It would allow to mark the page as a favorite as well as share the page on Facebook. It would bring up the menu to show the two options – Favorite and Share. Please refer the below screenshot for reference.

Please note that the text can be 'Add to favorites' or 'Remove from favorite' depending whether the page has already been added to favorite or not. Also note that marking the page as a favorite or removing the page from favorite should display an appropriate message.



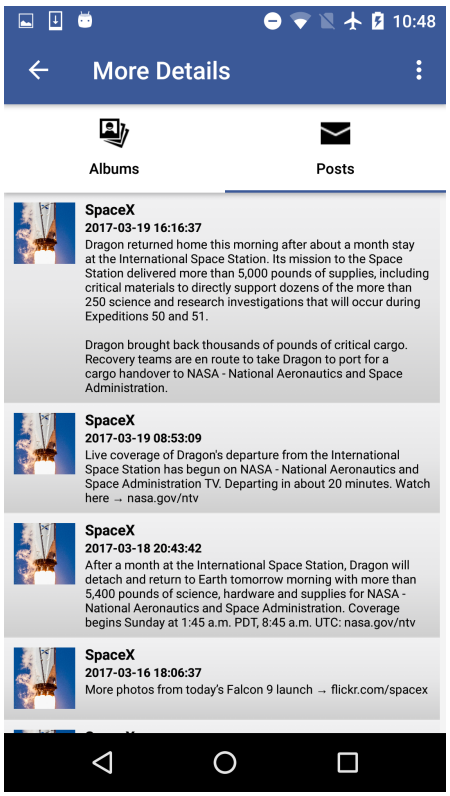
Thereon, the page can also share the page on Facebook. Please refer the Facebook Share section for reference.

On tapping an any of the 5 albums, the row should expand to show the 2 images within the concerned albums, as shown below. Furthermore, note that the upon tapping any other albums, the previously expanded album should collapse, if any. Also, upon tapping the expanded cell, the album should again collapse.

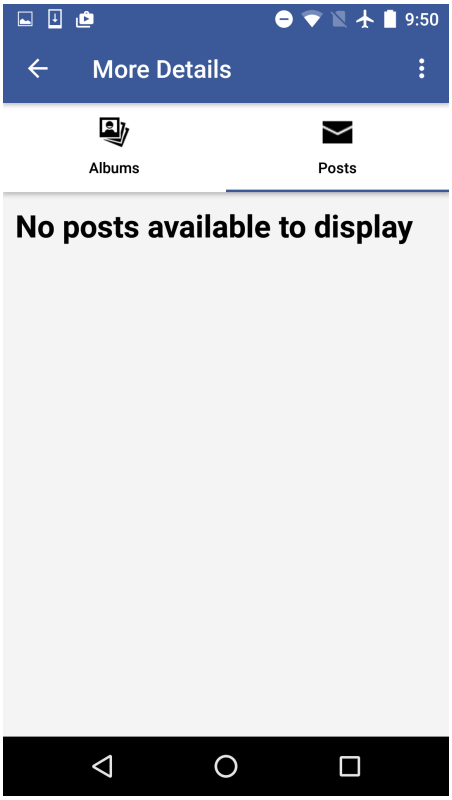


The posts tab should display the 5 posts, if available, within the ‘ListView’ component.

Please note that each row of the table, should display the page’s icon, the content of the post along with the formatted date.



Post data available



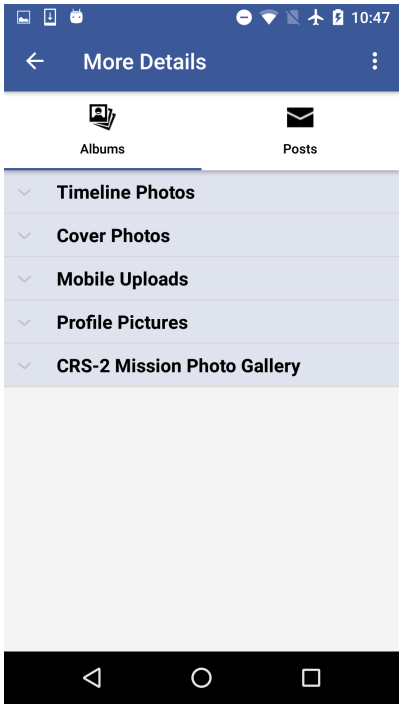
Post data unavailable

Please note that the back button should take you back to the search results screen on the 'Pages' tab.

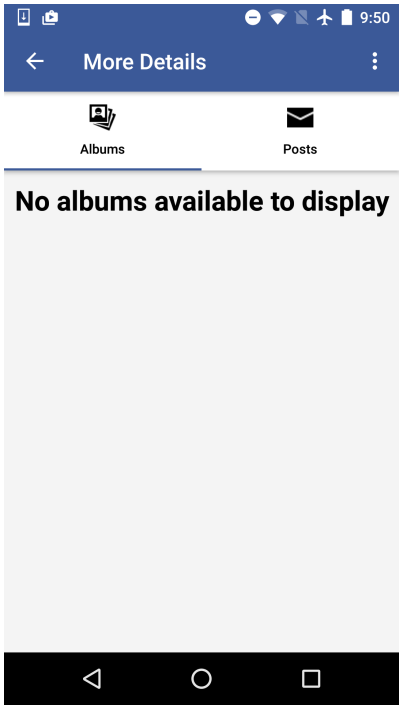
5.3.3 Event Detail

Tapping any of the table row, should move to the event details to show the event's albums and posts, if any. The event detail screen contains two tabs for 'Albums' and 'Posts'. By default, the albums tab should be shown.

Please consider the following screenshot for reference.



Album data available

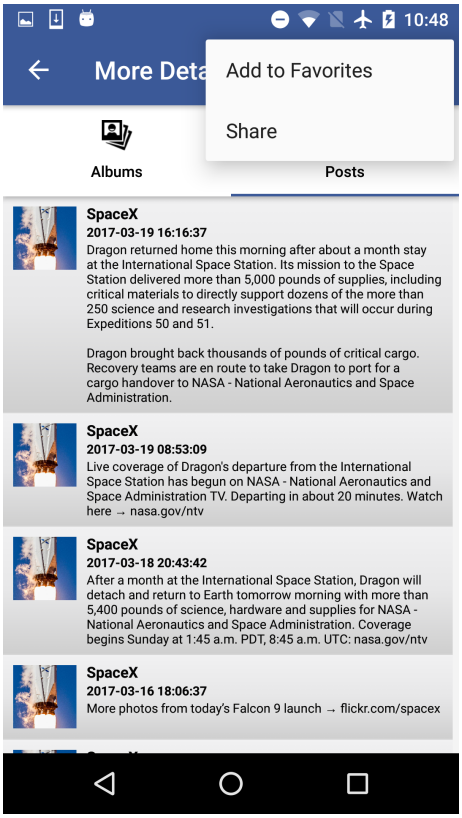


Album data unavailable

The albums tab should display the 5 albums, if available within the 'ExpandableListView' component. Also note that the cell should be collapsed by default. However, if no album data is found, just show a 'TextView' component showing an appropriate message.

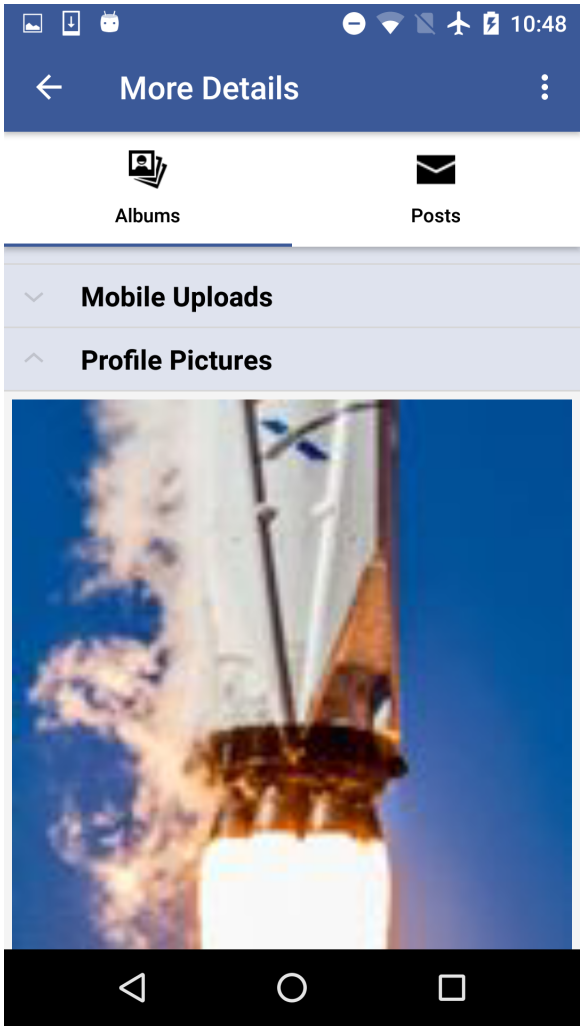
The event detail screen also contains the option menu option in the navigation bar. It would allow to mark the event as a favorite as well as share the event on Facebook. It would bring up the menu to show the two options – Favorite and Share. Please refer the below screenshot for reference.

Please note that the text can be 'Add to favorites' or 'Remove from favorite' depending whether the event has already been added to favorite or not. Also note that marking the event as a favorite or removing the event from favorite should display an appropriate message.



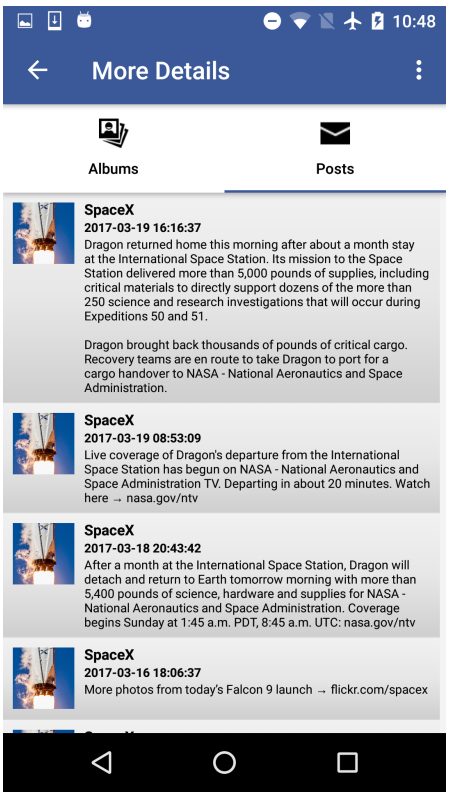
Thereon, the event can also share the event on Facebook. Please refer the Facebook Share section for reference.

On tapping an any of the 5 albums, the row should expand to show the 2 images within the concerned albums, as shown below. Furthermore, note that the upon tapping any other albums, the previously expanded album should collapse, if any. Also, upon tapping the expanded cell, the album should again collapse.

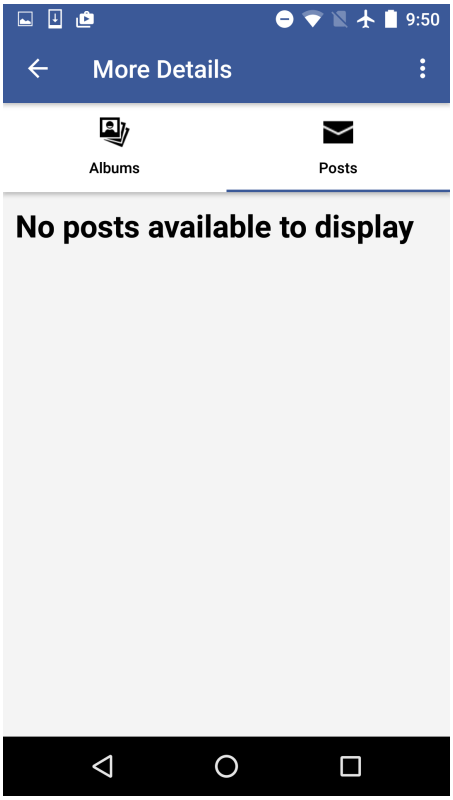


The posts tab should display the 5 posts, if available, within the ‘ListView’ component.

Please note that each row of the table, should display the event’s icon, the content of the post along with the formatted date.



Post data available



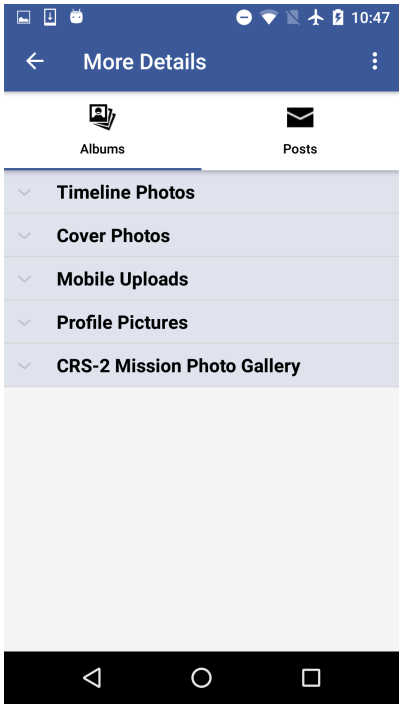
Post data unavailable

Please note that the back button should take you back to the search results screen on the 'Events' tab.

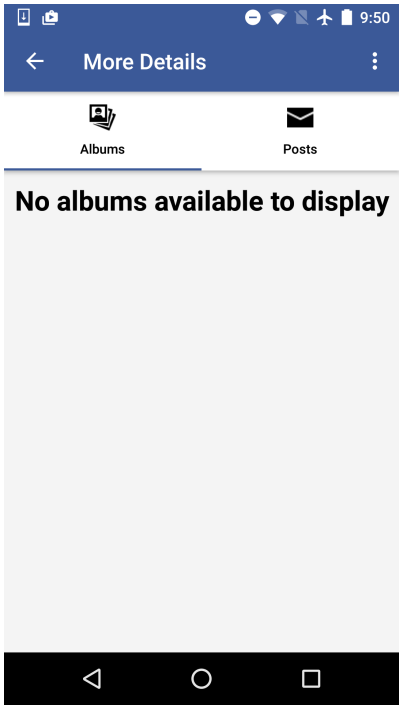
5.3.4 Page Detail

Tapping any of the table row, should move to the page details to show the page's albums and posts, if any. The page detail screen contains two tabs for 'Albums' and 'Posts'. By default, the albums tab should be shown.

Please consider the following screenshot for reference.



Album data available

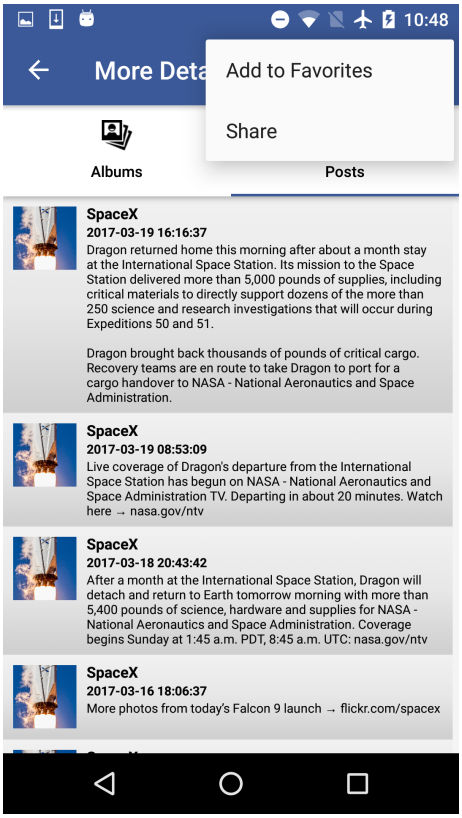


Album data unavailable

The albums tab should display the 5 albums, if available within the 'ExpandableListView' component. Also note that the cell should be collapsed by default. However, if no album data is found, just show a 'TextView' component showing an appropriate message.

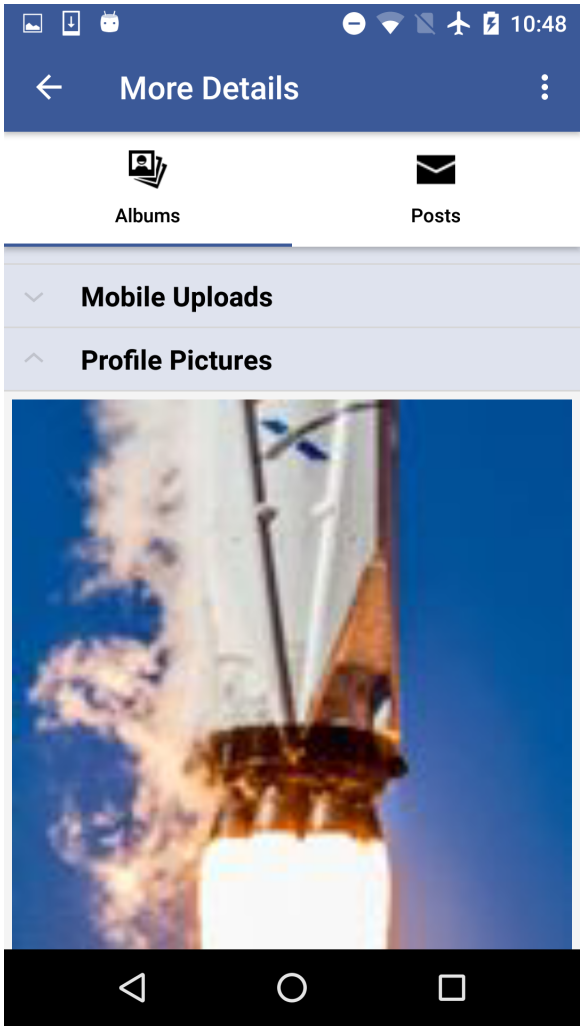
The page detail screen also contains the option menu option in the navigation bar. It would allow to mark the page as a favorite as well as share the page on Facebook. It would bring up the menu to show the two options – Favorite and Share. Please refer the below screenshot for reference.

Please note that the text can be 'Add to favorites' or 'Remove from favorite' depending whether the page has already been added to favorite or not. Also note that marking the page as a favorite or removing the page from favorite should display an appropriate message.



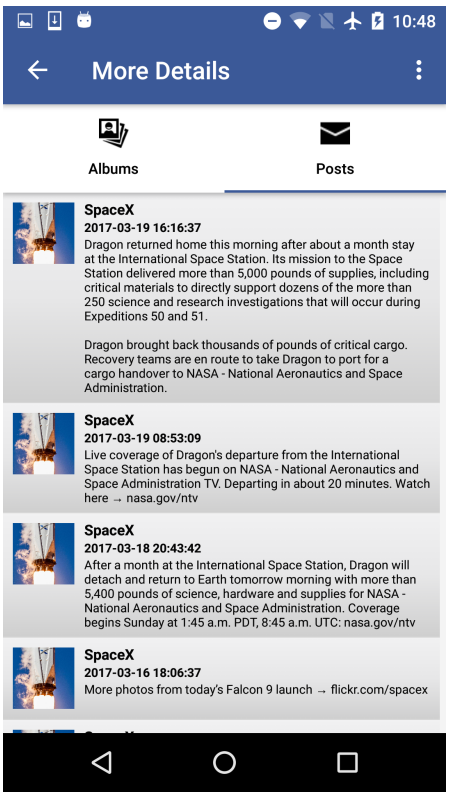
Thereon, the page can also share the page on Facebook. Please refer the Facebook Share section for reference.

On tapping an any of the 5 albums, the row should expand to show the 2 images within the concerned albums, as shown below. Furthermore, note that the upon tapping any other albums, the previously expanded album should collapse, if any. Also, upon tapping the expanded cell, the album should again collapse.

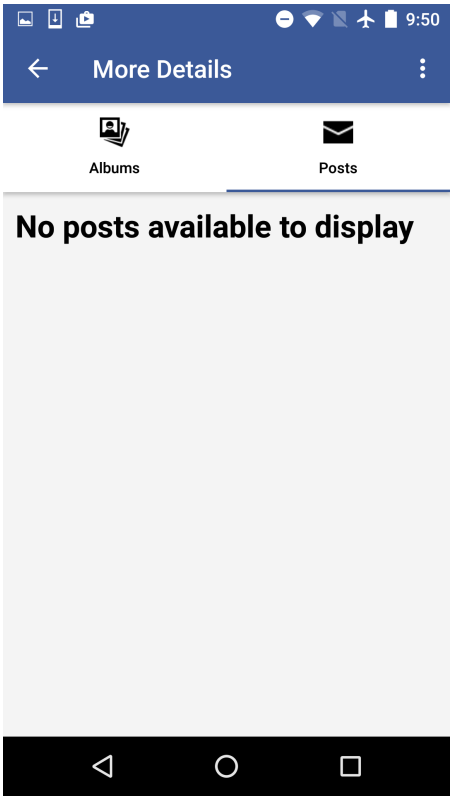


The posts tab should display the 5 posts, if available, within the ‘ListView’ component.

Please note that each row of the table, should display the page’s icon, the content of the post along with the formatted date.



Post data available



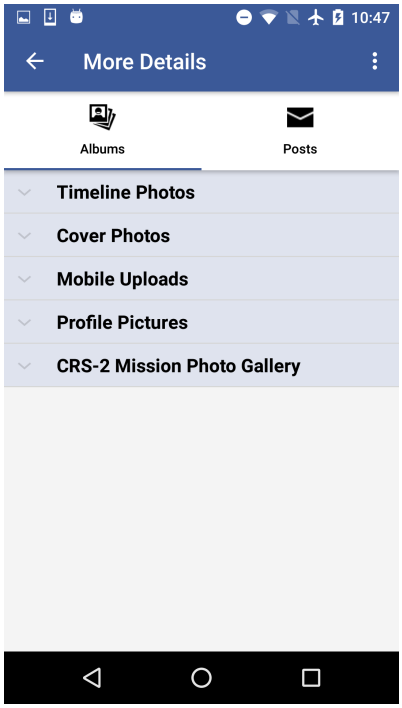
Post data unavailable

Please note that the back button should take you back to the search results screen on the 'Events' tab.

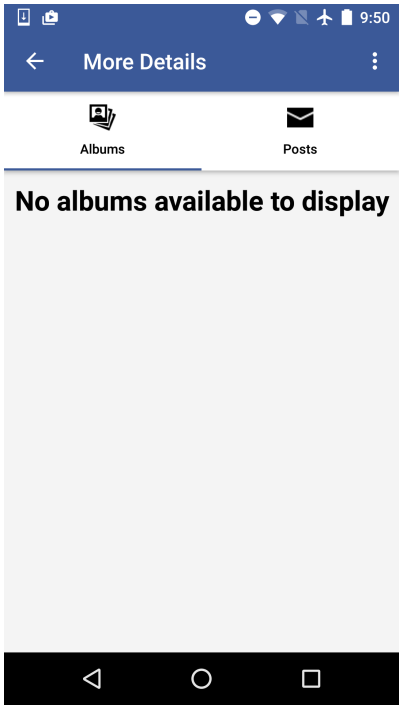
5.3.5 Group Detail

Tapping any of the table row, should move to the group details to show the group's albums and posts, if any. The group detail screen contains two tabs for 'Albums' and 'Posts'. By default, the albums tab should be shown.

Please consider the following screenshot for reference.



Album data available

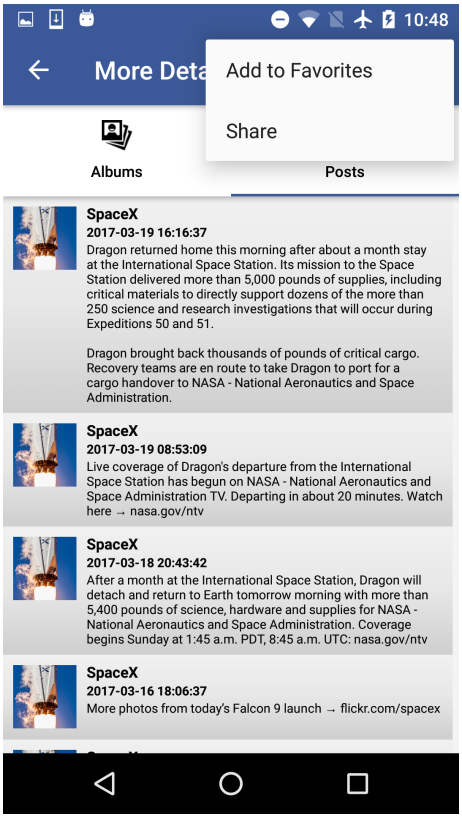


Album data unavailable

The albums tab should display the 5 albums, if available within the 'ExpandableListView' component. Also note that the cell should be collapsed by default. However, if no album data is found, just show a 'TextView' component showing an appropriate message.

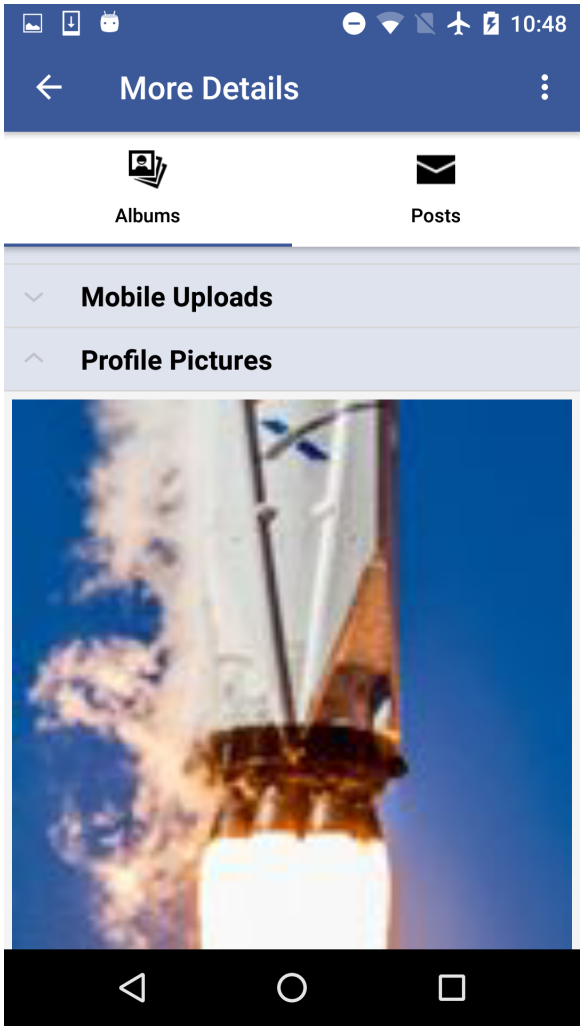
The group detail screen also contains the option menu option in the navigation bar. It would allow to mark the group as a favorite as well as share the group on Facebook. It would bring up the menu to show the two options – Favorite and Share. Please refer the below screenshot for reference.

Please note that the text can be 'Add to favorites' or 'Remove from favorite' depending whether the group has already been added to favorite or not. Also note that marking the group as a favorite or removing the group from favorite should display an appropriate message.



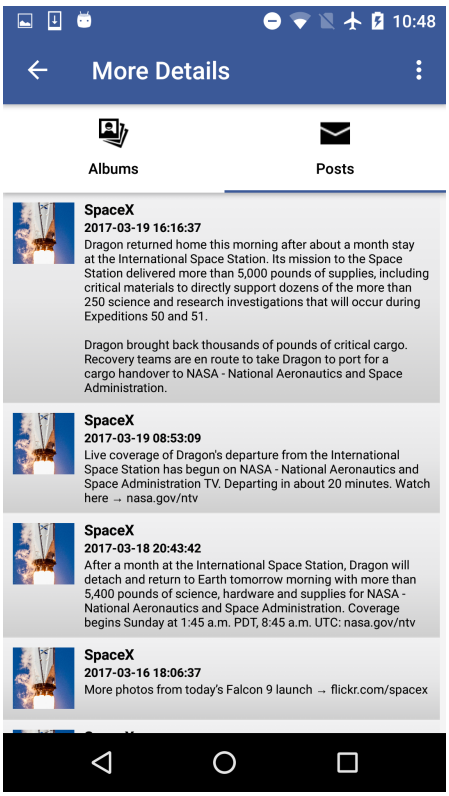
Thereon, the group can also share the group on Facebook. Please refer the Facebook Share section for reference.

On tapping an any of the 5 albums, the row should expand to show the 2 images within the concerned albums, as shown below. Furthermore, note that the upon tapping any other albums, the previously expanded album should collapse, if any. Also, upon tapping the expanded cell, the album should again collapse.

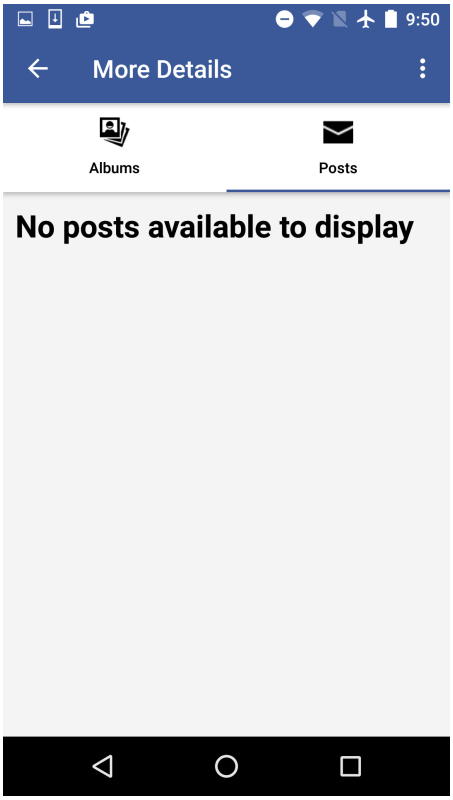


The posts tab should display the 5 posts, if available, within the ‘ListView’ component.

Please note that each row of the table, should display the group’s icon, the content of the post along with the formatted date.



Post data available



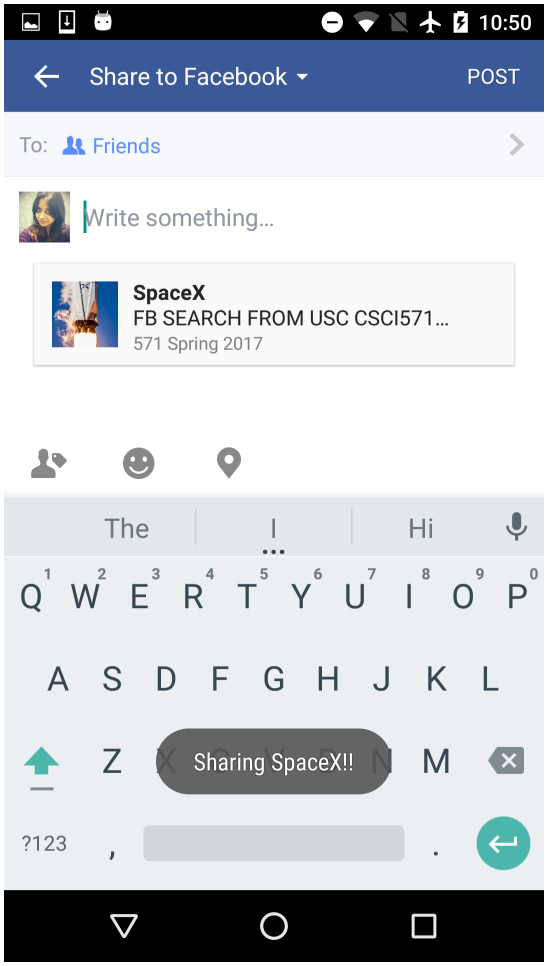
Post data unavailable

Please note that the back button should take you back to the search results screen on the 'Events' tab.

5.4 Facebook Share

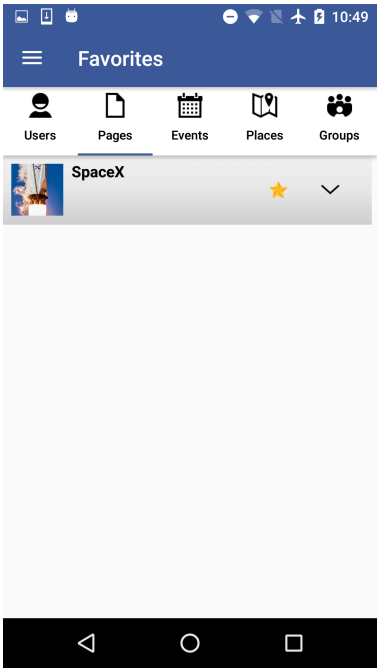
The user can share any of the searched results (user/page/event/place/group) on Facebook using the option menu displayed in the detail screen. Please refer the below screenshot for reference.

Please note the post needs to display the icon and name of the result that is being shared.



5.6 Favorite

The favorite screen would display all the favorited users/pages/events/places/group that have been marked as favorite. Please refer the below screenshot as reference.



Favorite pages

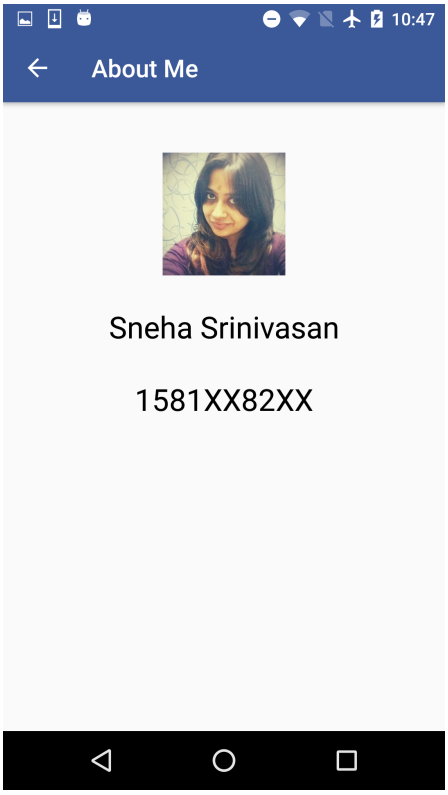
The design of the individual tabs remains exactly the same as the earlier search result's tab. The only difference being these display the favorited results instead of the search results. The order of the entry within a table would be the order the search results were marked as favorites.

Also note that the selection of any row would also lead to the corresponding details screen. Please ensure that the table data is kept in sync with the favorites, especially when any of the result has been removed from the favorites.

5.7 About

You will also have to implement an additional menu item in the slide out menu that links to a screen which displays information about you.

The about page should look as below:



6. Resources

Please find the icons to be utilized in the app at:

http://cs-server.usc.edu:45678/hw/hw9/images/android/albums.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/details.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/events.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/favorites_off.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/favorites_on.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/groups.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/home.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/logo.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/pages.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/places.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/posts.png

http://cs-server.usc.edu:45678/hw/hw9/images/android/users.png

7. Implementation Hints

See the HW9 Android Clues file.

8. Material You Need to Submit

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, in the Announcement page and in Piazza.

You should also ZIP your project source directory and SUBMIT the resulting ZIP file. Make sure that the source path does not include the .app file or image files in the product folder.