

TOURIST ASSIST APPLICATION

CS487: Software Engineering

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User Analysis

A research has been done on what possible users might want, in a tourist application, a questionnaire has been given to a number of people in different age groups and different languages, this questionnaire helped the team member gain more understanding of what a tourist application might need to provide to its users, in order for it to be useful to them.

The purpose of that questionnaire was to answer these questions:

- **Who are the users?**

The users of this application are people who are visiting a new place, or planning to visit a new one.

- **What do the users want?**

The tourists mostly want an application that has a simple and efficient interface, one that they can understand and easily use. They want the application to be fast, in case they wanted to use it while in a hurry of wanting to find a new place to visit at that time, and they would also want the application to support different languages other than English such as French and Spanish, for not all users are fluent or even good with English.

- **What are the users' goals?**

The tourists' goals are to have an application that can help them with finding hotels, restaurants, the theatres, and the nightlife in the city. One that also shows them the famous attraction in the city, and the hospitals in case they needed one. They want

to be able to read reviews on these places to see what other people think about them.

- **What are individual characteristics that may effect behavior with software or information designed?**

One of the main characteristics that could effect the software is the language of the tourists, the application may be built to accommodate those different languages, another one is the fact that many of them tend to want something to be always available and offers data fast, so the application will be built to accommodate those needs.

- **What do they know that helps them perform their tasks?**

From what the members noticed most of the people these days have at least basic knowledge at using web applications and their mobile phones, and as long as the user interface is built to be simple, most of the tourists should be able to use it.

- **Do they want a user interface that is fun, not boring?**

Many people have answered this question with a yes, but with a request of user experience being simple.

Requirements Specification

From the user analysis that has been done by the team, a set of requirements has been deduced. The Tourist Assist application will be built on a set of functional and non-functional requirements:

Functional requirements:

- This application shall be able to find the location of:
 - Hotels
 - Famous Restaurants
 - Museums
 - Shopping malls
 - Hospitals
 - Bars Pubs or Clubs
 - Movies and Theatrical Shows
- This application shall behave in a way such that it can find the location and pin point the coordinates accordingly.
- This application shall have a search functionality that allows to filter the places by price, category, rating and popularity.

This application shall allow the user to view, write reviews and rate the places that

have been visited.

- This application should be able to list current events in current city or the one to be visited.

- This application should show transit points
- This application should offer social network connection that the user may use to share his experience.
- This application should support multiple languages: English, French and Spanish.
- This application should memorize the places that have been already visited by the user.

Non-Functional requirements:

- The application shall be available of most of the time.
- The application should have high performance.
- The application shall allow User Access.
- The application should be reliable.

Functional Requirements Use-case diagrams:

- This application shall be able to find the location of:
 - Hotels
 - Famous Restaurants
 - Museums
 - Shopping malls
 - Hospitals
 - Bars Pubs or Clubs
 - Movies and Theatrical Shows

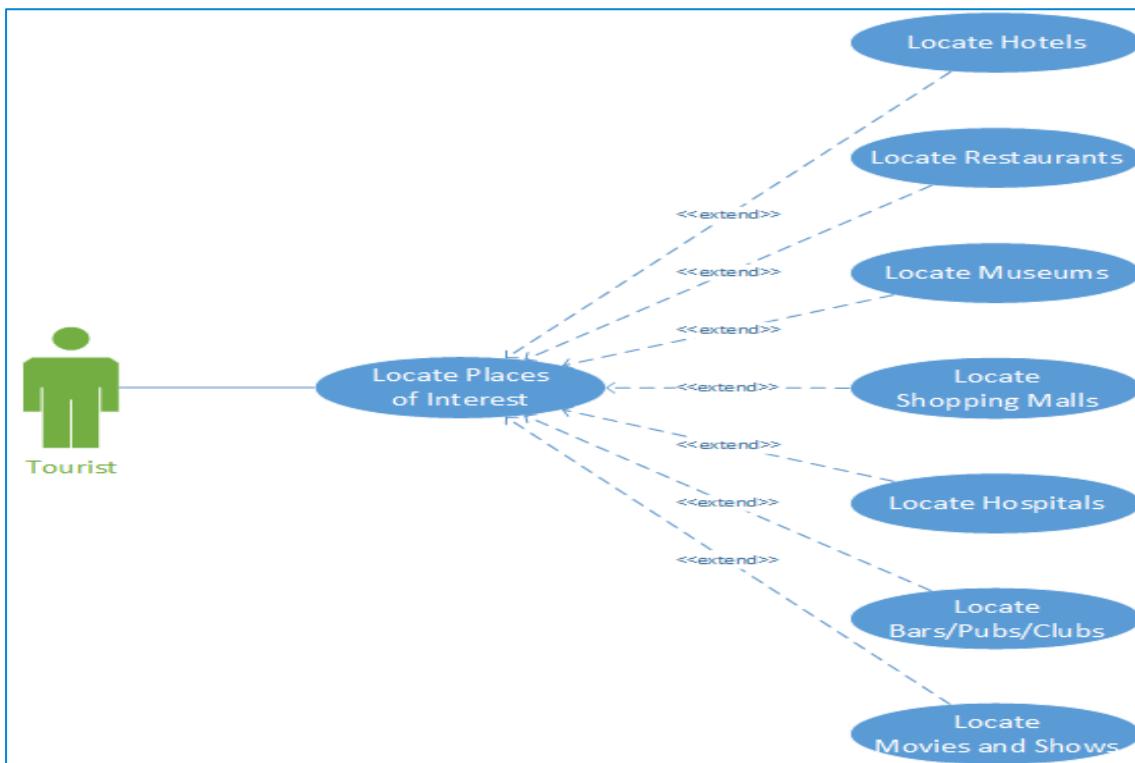
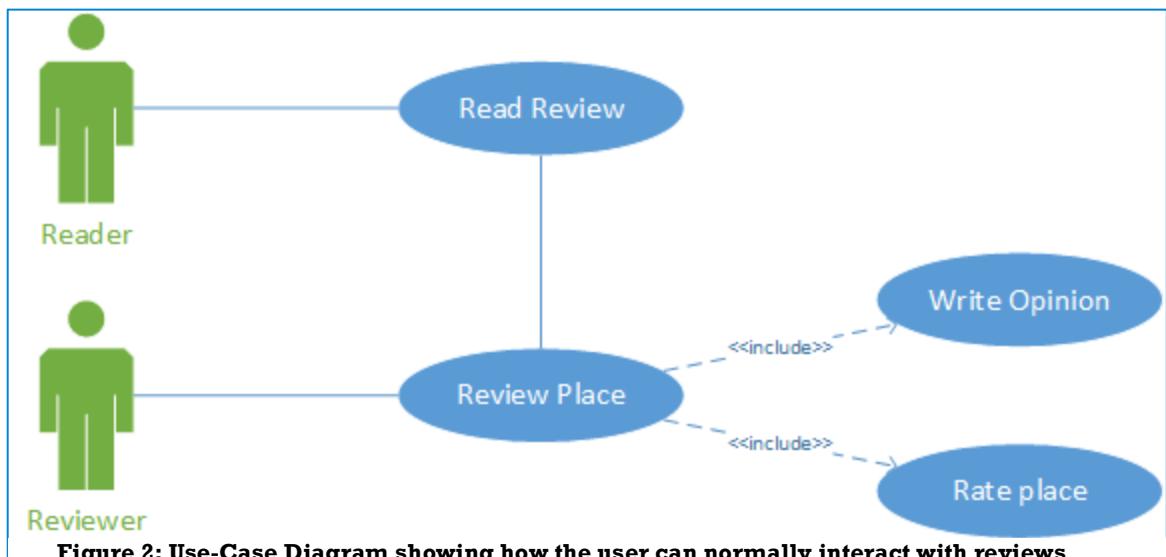


Figure 1: Use-case Diagram showing how the application would normally work when the user interacts with it

- This application shall allow the user to view, write reviews and rate the places th
places that have been visited.



- This application should memorize the places that have been already visited by the user.

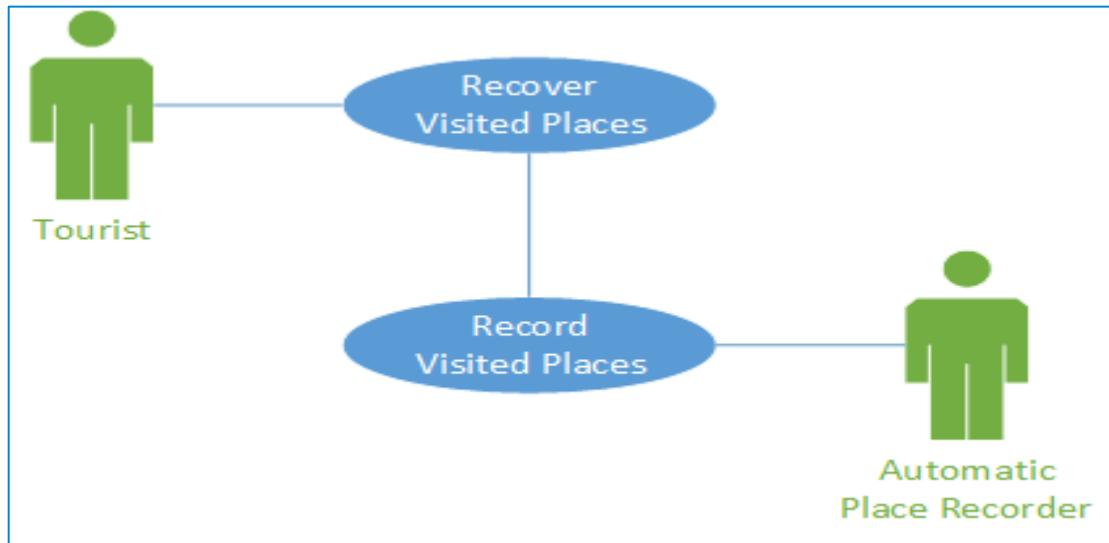


Figure 3: Use-case Diagram showing how the record and recover functionality would normally work

High-Level Designs

Once the decision on what the requirements of this application should be has been made, the team started to build the databases that the application will need to meet the users wants in a tourist application. A database model diagram followed by an Entity Relation Diagram, to show the main tables in the database, the fields they contain and their connections to the

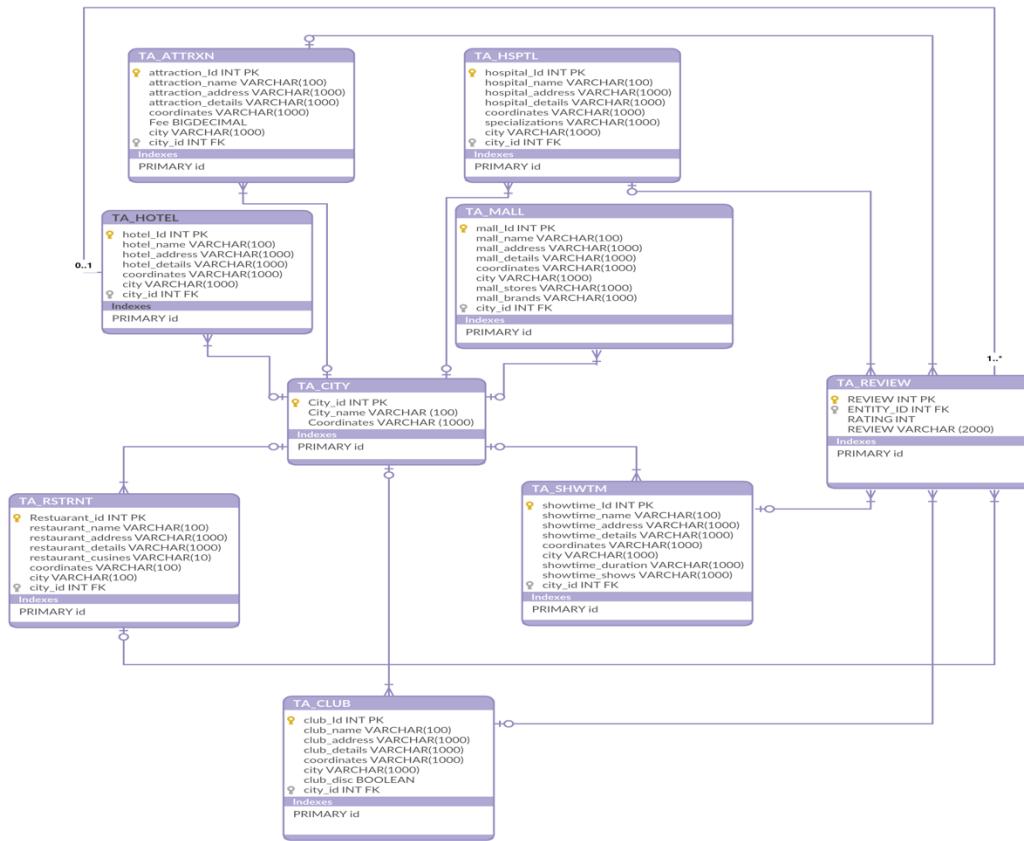


Figure 4: Database Diagram for a whole view of the database tables

After setting up the database and the required tables, a state transition diagram has been built to clearly state how the application will act, to meet the stated requirements.

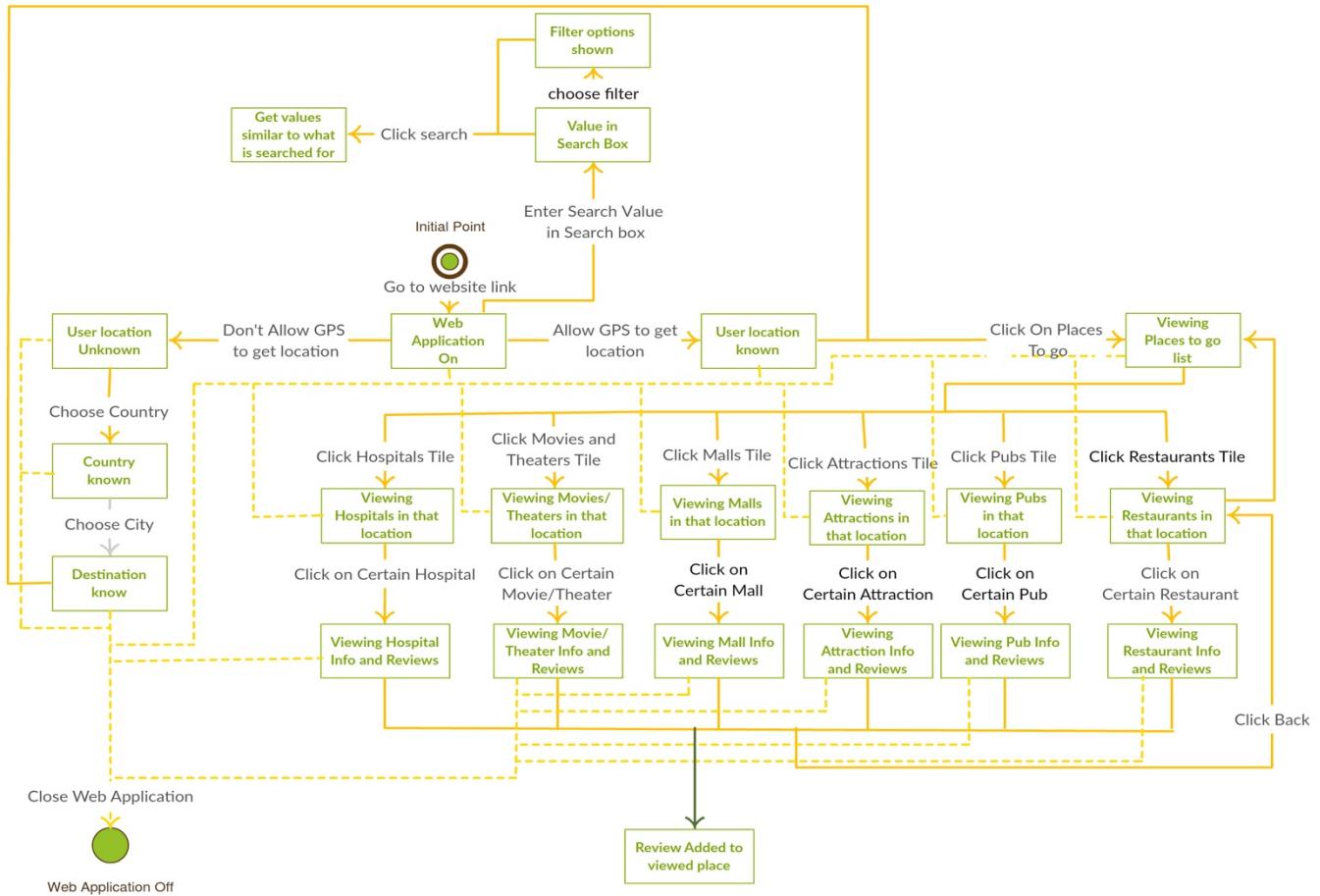


Figure 5: State Transition Diagram for the Tourist Assist Application

Once the state transition diagram was drawn, a sequence diagram depicting the user interaction with the application was drawn.

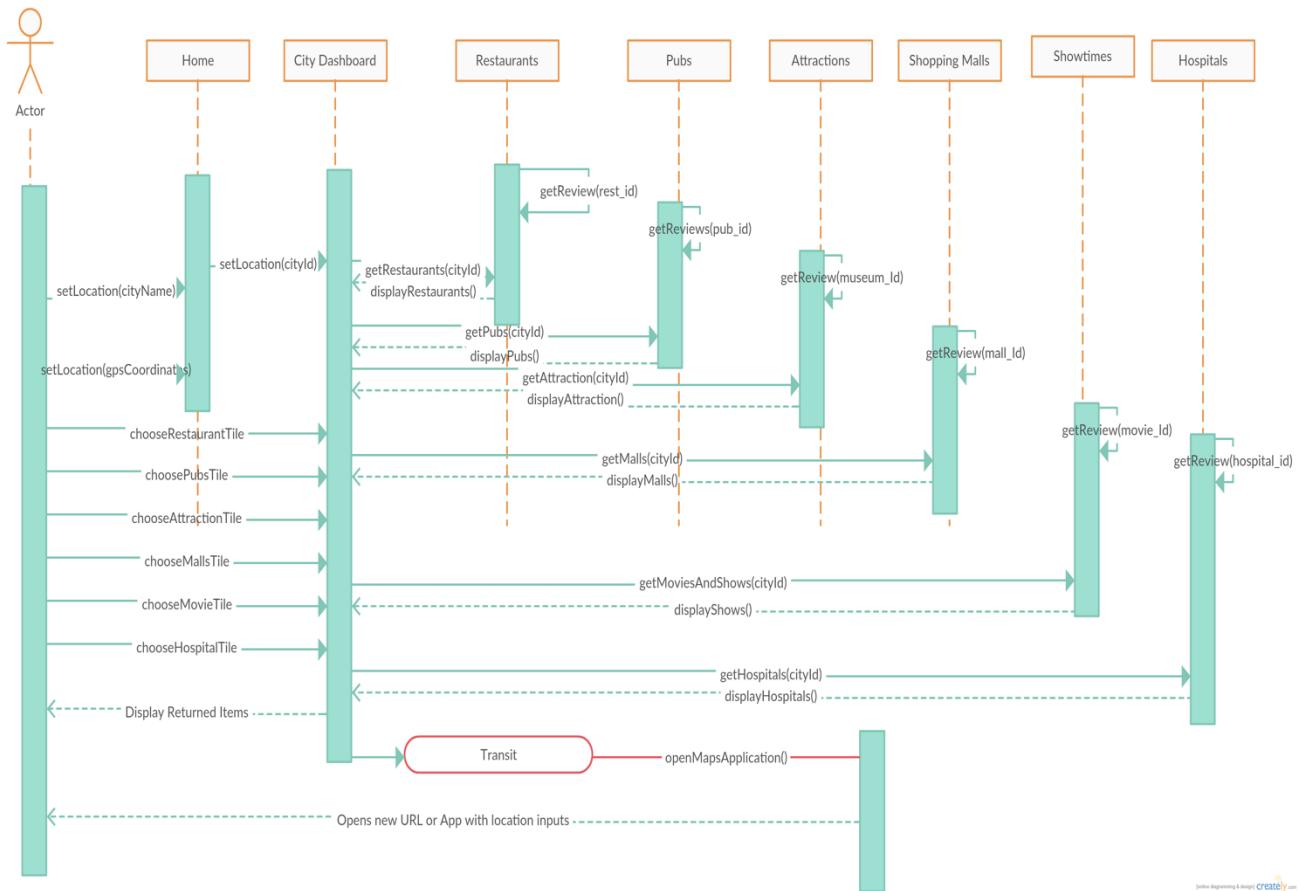


Figure 6: A sequence Diagram the shows how the user interacts with the application

With the sequence Diagram a Data-flow Diagram was also to drown show the data flow through the system.

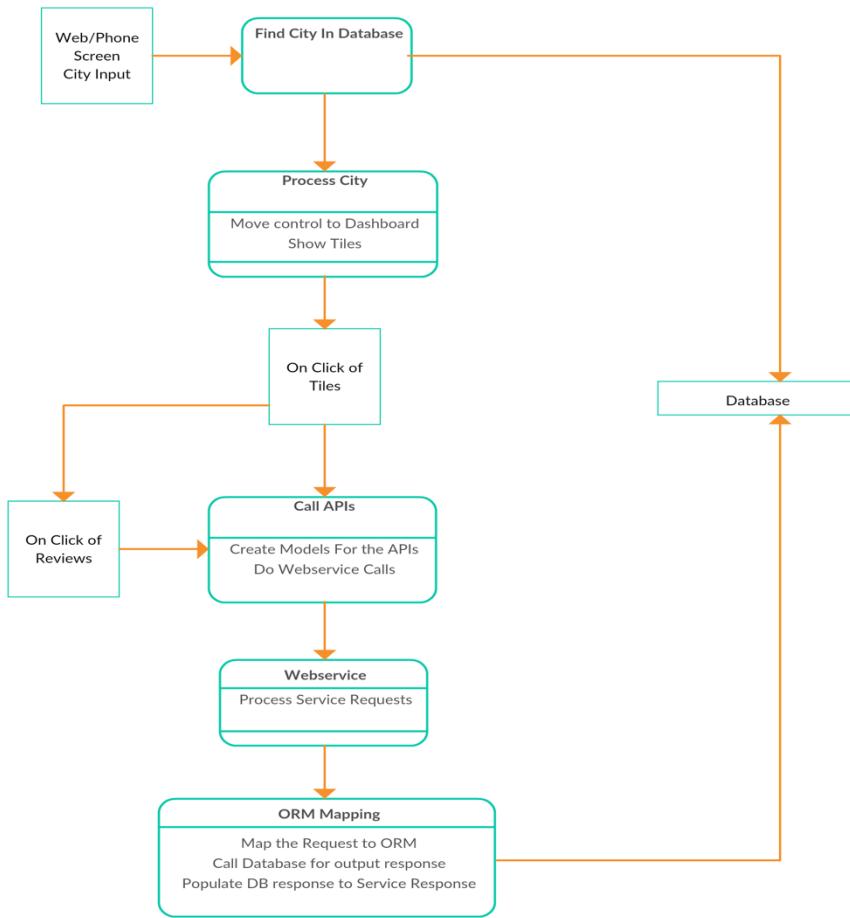


Figure 7: Data flow Diagram that shows the flow of the data in the application

A class Diagram that shows the application's classes was drawn to provide a better view and understanding on the application's structure.

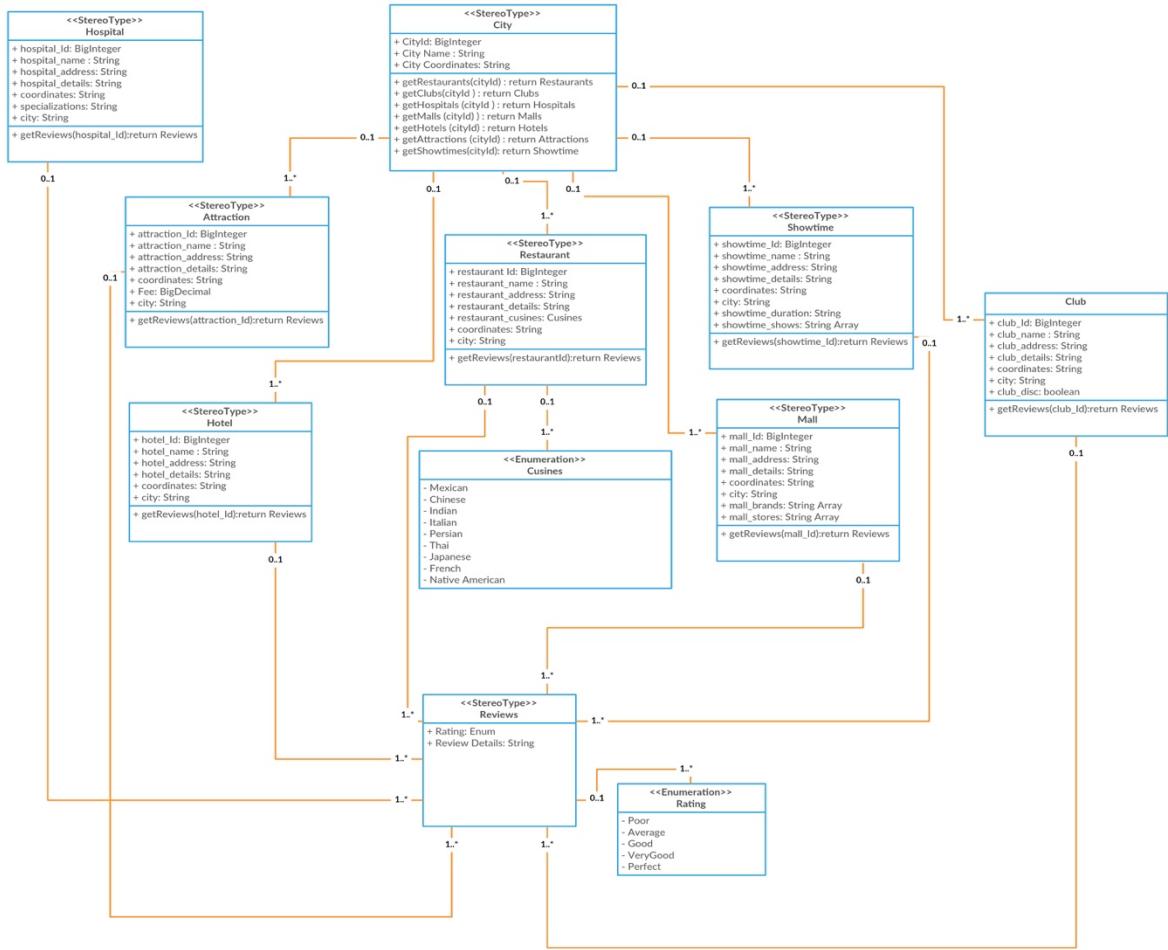


Figure 7: Class Diagram the shows the application structure

Test Plans

The followings are some of the scenarios and use cases for different modules of Tourist Assist

Application:

Functional Requirement Parameters

Use case ID: 1

Use case Name: Look up for nearby Restaurants and check reviews

Actors: User (tourist)

Description: Test whether user is able to look up for a restaurant in the city and get reviews on the selected restaurant.

Post condition: User should select/click on restaurants and get review option

Normal flow:

1. Open the application.
2. Look up for restaurants option.
3. Select the restaurant.
4. Click on get review.
5. Close the application.

Exceptions:

1. User is unable to get the restaurants.
2. User is unable to get review.

Use case ID: 2

Use case Name: Look up for nearby Pubs and check reviews

Actors: User (tourist)

Description: Test whether user is able to look up for a pub in the city and get reviews on the selected pub.

Post condition: User should select/click on pubs and get review option

Normal flow:

1. Open the application.
2. Look up for pubs option.
3. Select the pub.
4. Click on get review.
5. Close the application.

Exceptions:

1. User not able to get the pubs.
2. User not able to get review.

Use case ID: 3

Use case Name: Look up for nearby Attractions and check reviews

Actors: User (tourist)

Description: Test whether user is able to look up for in the city and get reviews on the selected attraction/museum.

Post condition: User should select/click on attractions and get review option

Normal flow:

1. Open the application.
2. Look up for attractions option.
3. Select the attraction/museum.
4. Click on get review.
5. Close the application.

Exceptions:

1. User not able to get the attractions.
2. User not able to get review.

Use case ID: 4

Use case Name: Look up for nearby Shopping Malls and check reviews

Actors: User (tourist)

Description: Test whether user is able to look up for shopping malls nearby current location and get reviews on the selected mall.

Post condition: User should select/click on shopping malls and get review option

Normal flow:

1. Open the application.
2. Look up for shopping malls option.
3. Select the mall.
4. Click on get review.

5. Close the application.

Exceptions:

1. User not able to get the nearby shopping malls.
2. User not able to get review.

Use case ID: 5

Use case Name: Look up for Showtime of a movie nearby and check review of the movie.

Actors: User (tourist)

Description: Test whether user is able to look up for a show time nearby current location and get reviews on the selected movie.

Post condition: User should select/click on show time and get review option

Normal flow:

1. Open the application.

2. Look up for show time option.

3. Select the movie.

4. Click on get review.

5. Close the application.

Exceptions:

1. User not able to get the nearby show time.
2. User not able to get review.

Use case ID: 6

Use case Name: Look up for nearby Hospitals and check reviews

Actors: User (tourist)

Description: Test whether user is able to look up for a hospital in the city and get reviews on the selected hospital.

Post condition: User should select/click on hospitals and get review option

Normal flow:

1. Open the application.
2. Look up for hospitals option.
3. Select the hospital.
4. Click on get review.
5. Close the application.

Exceptions:

1. User not able to get the nearby hospitals.
2. User not able to get review.

Use case ID: 7

Use case Name: Look up for Transit availability

Actors: User (tourist)

Description: Test whether user is able to look up for a transit nearby current location.

Post condition: User should select/click on transit and input the name of the destination.

Normal flow:

1. Open the application.
2. Look up for transit option and click on it.
3. Opens Maps Application (opens new URL or app with location inputs).
4. Enter the destination.
5. Close the application.

Exceptions:

1. Maps application is not loaded.
2. User unable to enter location inputs.

Non Functional Requirements Parameters

Non Functional requirement Matrix	Level(High/Low/Medium)
Performance	High
Scalability	Medium
Capacity	High
Availability	High
Reliability	Medium
Extensibility	Medium
Usability	High

Usability:

In the tourist assist app, user groups are

- Tourist – of different age group, and different native languages

Application final Design

The application was designed with a certain focus of fulfilling the main requirements, it offers a simple design that the user can easily interact with. The testing plans have been executed in order to make sure that the application can run normally without facing any exceptions, and if any were faced they were caught and handled correctly.

The application UI-Design



Team Performance

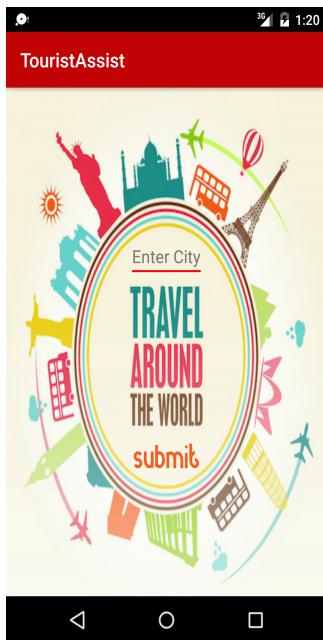
The team members have worked and collaborated on achieving this project's requirement and goals. Each member was accountable for their work, and they were able to correct and test the parts they were working on. The work was divided among the members according to their experience, and the available amount of time, each member had completed the work assigned to them in the assigned time slot, and with that the team was able to complete the project in the given time. The Backend part of the project was developed by Saurabh Tiwari, and the front end (The coding of the mobile application and the designing of the layout) was developed by the other team members: Fatema Alteneiji, Ernesto Garcia, Chethan Appaji and Moosa Hana.

Testing

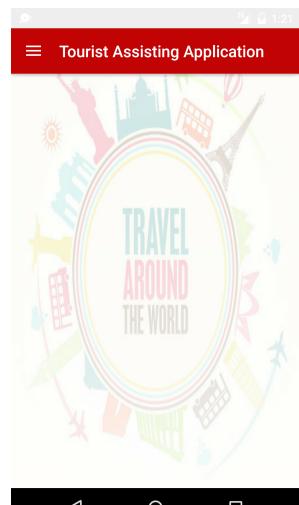
Main Screen

Code: MainScreenTest00

Case Description: The city name is entered and the submit button is clicked.



Expected Result: A new view shows the navigation screen.

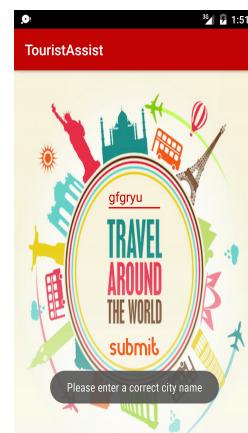


Code: MainScreenTest01

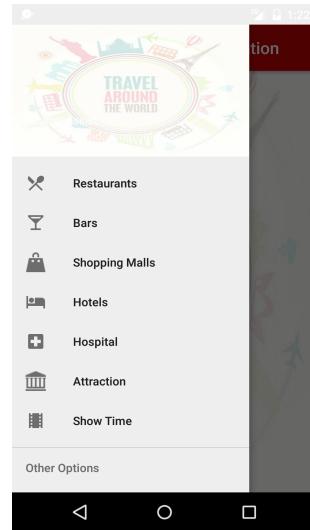
Case Description: No city or wrong city name entered and then the submit button was clicked



Expected Result: An error message is displayed and the user will have to re-enter the city name



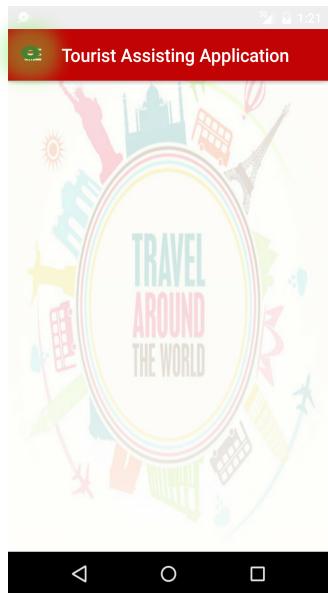
Test Code	Passed	Failed
MainScreenTest 00		
MainScreenTest 01		



Navigation Screen

Code: NavigationScreenTEst01

Case Description: user clicks on the left side of the upper toolbar.



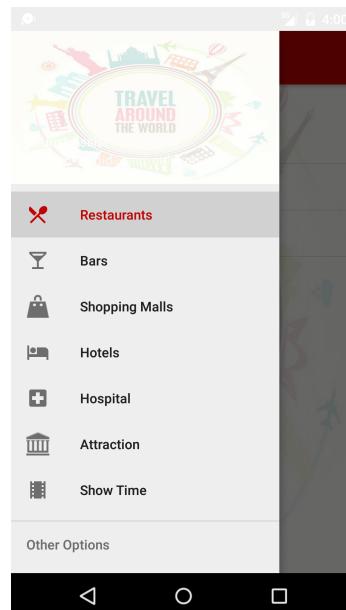
Expected Result: a navigation bar should slide from the left side

Test Code	Passed	Failed
NavigationScreenTe st00		

Restaurants

Code: RestauratTest00

Case Description: The Restaurant button is clicked on the menu.



Expected Result: A new view shows the list of restaurants.



Code: RestaurantTest01

Case Description: One of the rows is clicked in the list of Restaurants. This Restaurant has no reviews.



Expected Result: A new view shows the details of the associated restaurant. The table of reviews is hidden.



Code: RestaurantTest02

Case Description: One of the rows is clicked in the list of restaurants. This restaurant has reviews.



Expected Result: A new view shows the details of the associated restaurant. The table of reviews is included.

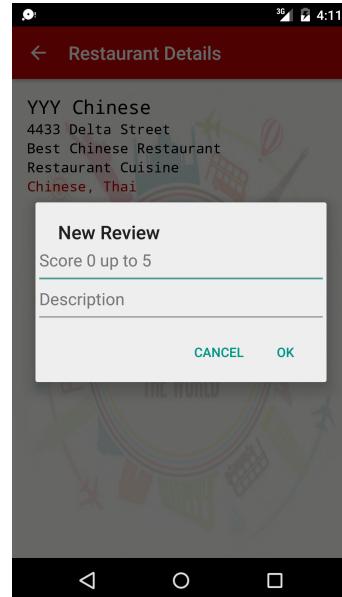


Code: RestaurantTest03

Case Description: Add review button is clicked.

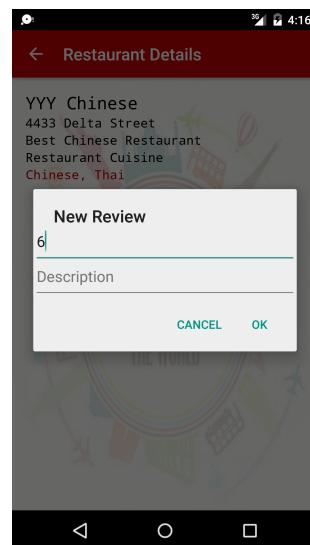


Expected Result: A review input dialog is shown.

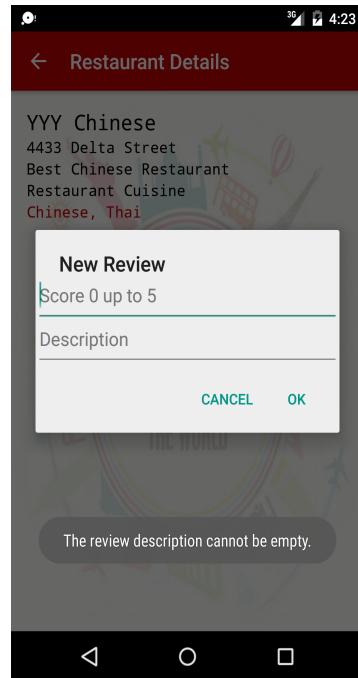
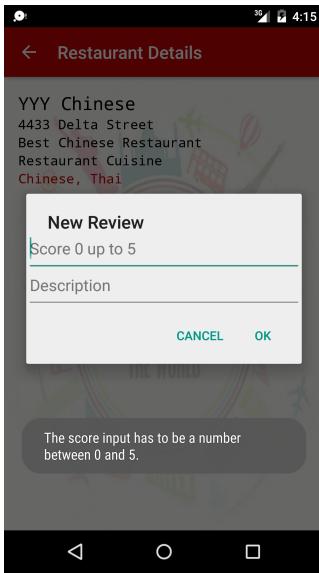


Code: RestaurantTest04

Case Description: the score introduced by the user is out of the supported interval and the user clicks on OK.

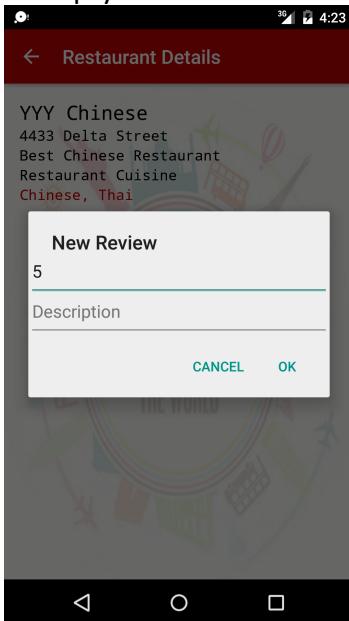


Expected Result: An error message is displayed and the dialog is re-launched.



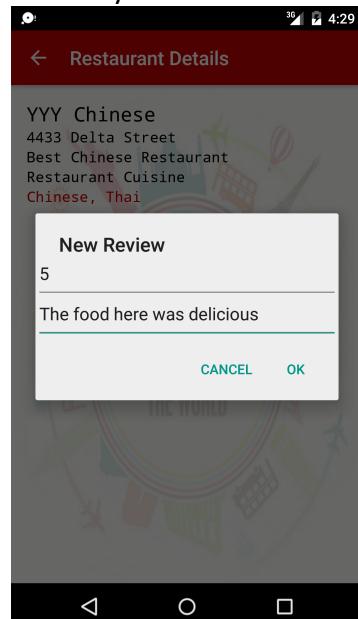
Code: RestaurantTest05

Case Description: Description input box is empty and the user clicks on OK.



Code: RestaurantTest06

Case Description: Both fields are correctly filled and the user clicks on OK.



Expected Result: An error message is displayed.

Expected Result: The new review is posted.



Expected Result: The Restaurants list is shown.



Code: RestaurantTest07

Case Description: The user clicks on back button.

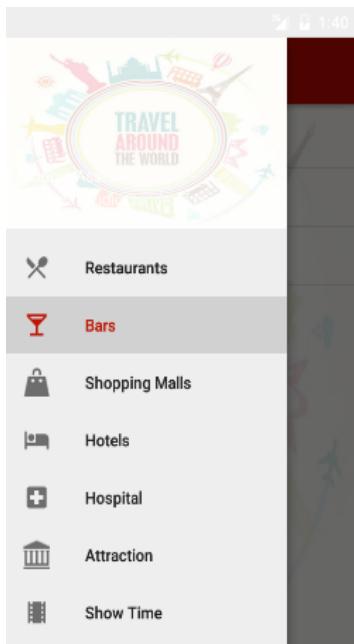


Test Code	Passe d	Failed
RestaurantTest 00		
RestaurantTest 01		
RestaurantTest 02		
RestaurantTest 03		
RestaurantTest 04		
RestaurantTest 05		
RestaurantTest 06		
RestaurantTest 07		

Bars

Code: BarTest00

Case Description: The Bars button is clicked on the menu.

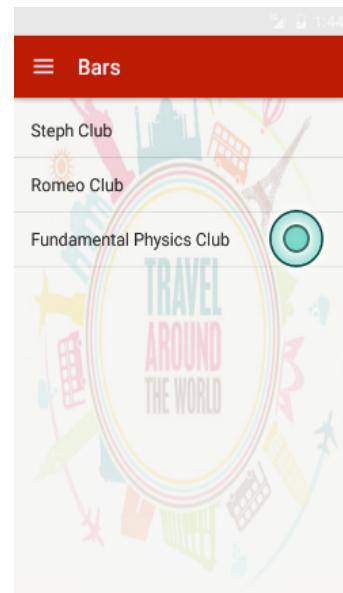


Expected Result: A new view shows the list of bars.

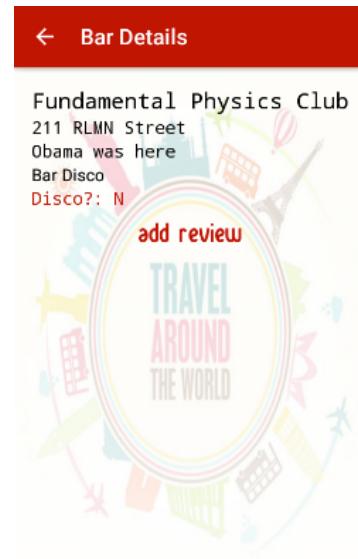


Code: BarTest01

Case Description: One of the rows is clicked in the list of bars. This bar has no reviews.

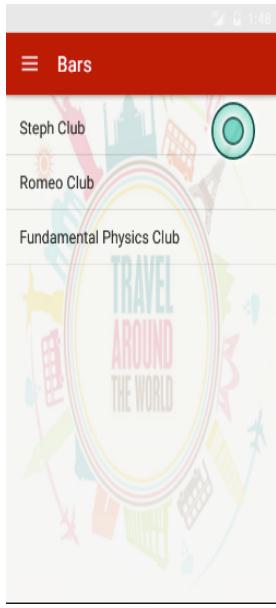


Expected Result: A new view shows the details of the associated bar. The table of reviews is hidden.



Code: BarTest02

Case Description: One of the rows is clicked in the list of bars. This bar has reviews.



Expected Result: A new view shows the details of the associated bar. The table of reviews is included.

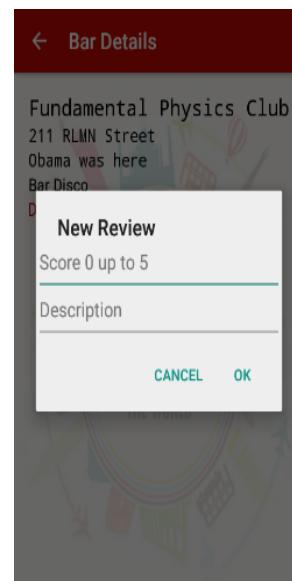


Code: BarTest03

Case Description: Add review button is clicked.

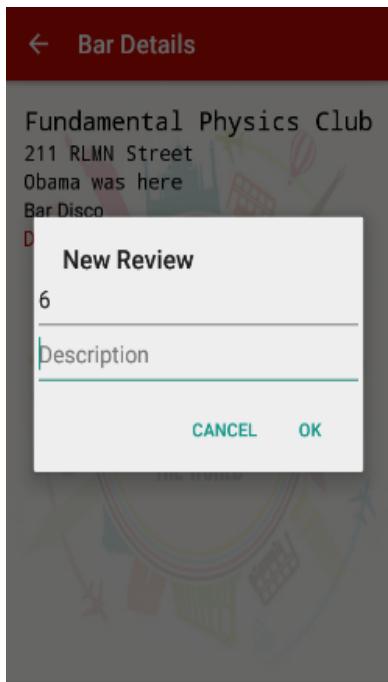


Expected Result: A review input dialog is shown.

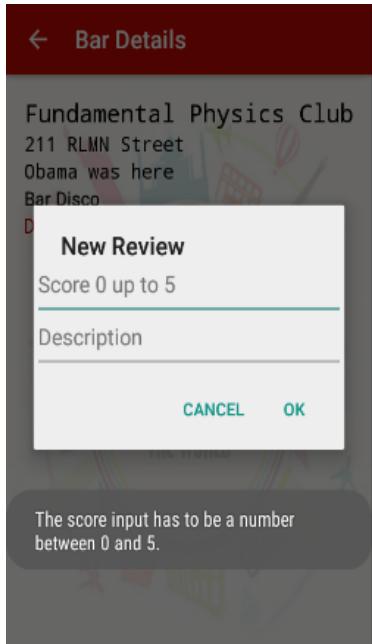


Code: BarTest04

Case Description: the score introduced by the user is out of the supported interval and the user clicks on OK.

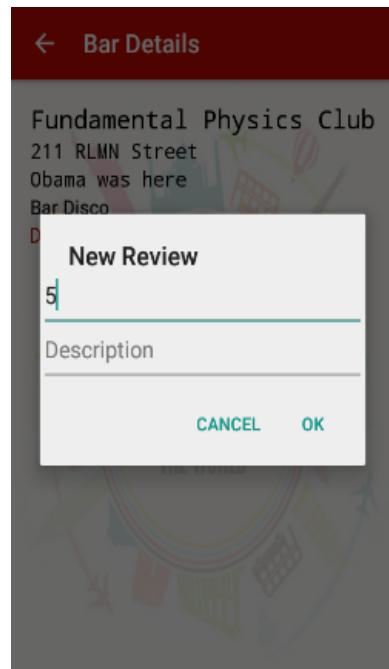


Expected Result: An error message is displayed and the dialog is re-launched.

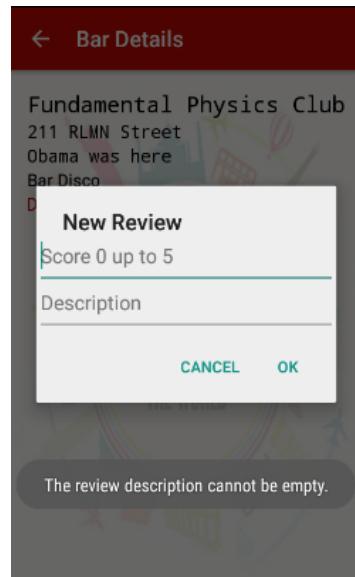


Code: BarTest05

Case Description: Description input box is empty and the user clicks on OK.

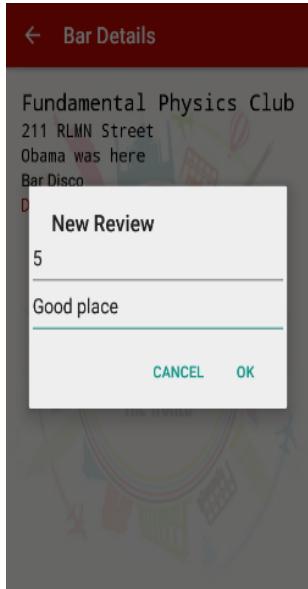


Expected Result: An error message is displayed.



Code: BarTest06

Case Description: Both fields are correctly filled and the user clicks on OK.



Expected Result: The new review is posted.

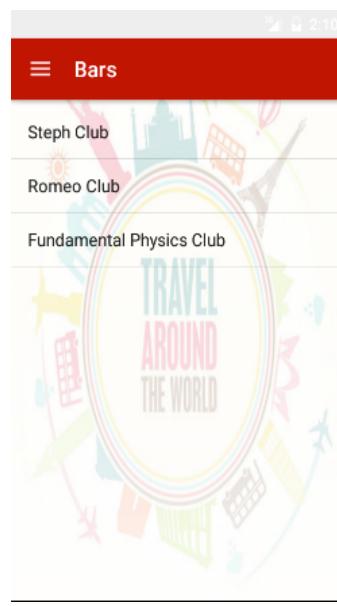


Code: BarTest07

Case Description: The user clicks on back button.



Expected Result: The bars list is shown.



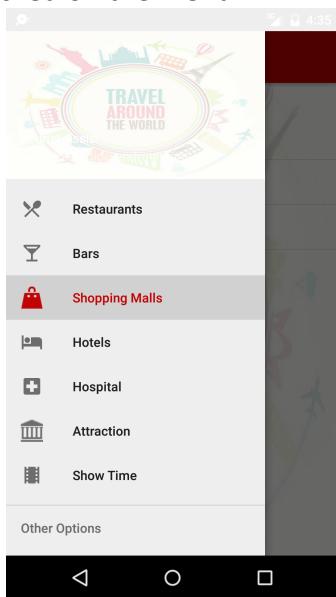
Test Code	Passed	Failed
BarTest00	Passed	
BarTest01	Passed	
BarTest02	Passed	
BarTest03	Passed	
BarTest04	Passed	
BarTest05	Passed	
BarTest06	Passed	
BarTest07	Passed	



Shopping Malls

Code: MallTest00

Case Description: The Mall button is clicked on the menu.



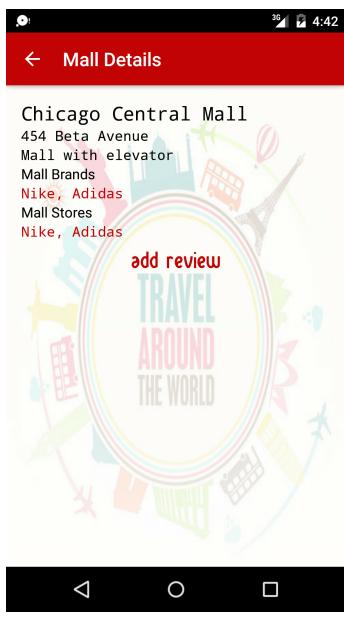
Expected Result: A new view shows the list of malls.

Code: MallTest01

Case Description: One of the rows is clicked in the list of Restaurants. This mall has no reviews.



Expected Result: A new view shows the details of the associated mall. The table of reviews is hidden.



Code: MallTest02

Case Description: One of the rows is clicked in the list of malls. This mall has reviews.



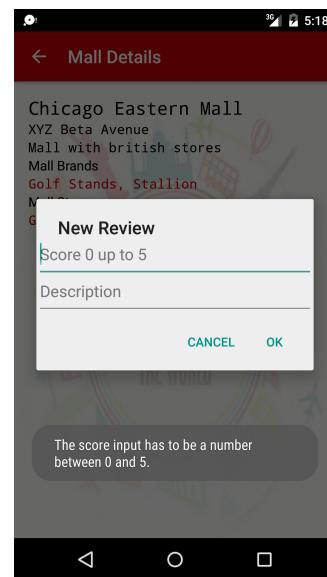
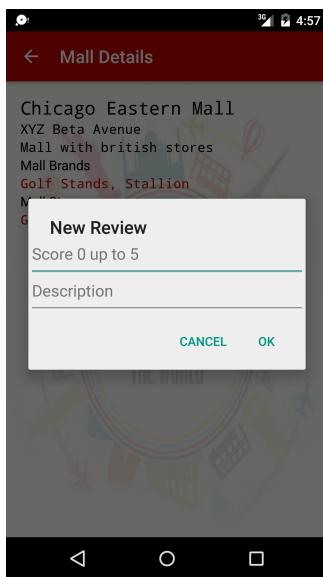
Code: MallTest03

Case Description: Add review button is clicked.



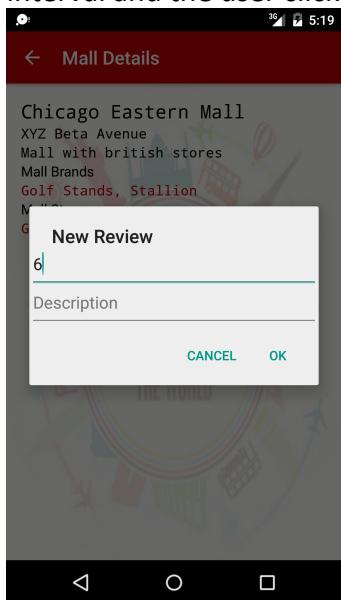
Expected Result: A new view shows the details of the associated mall. The table of reviews is included.

Expected Result: A review input dialog is shown.



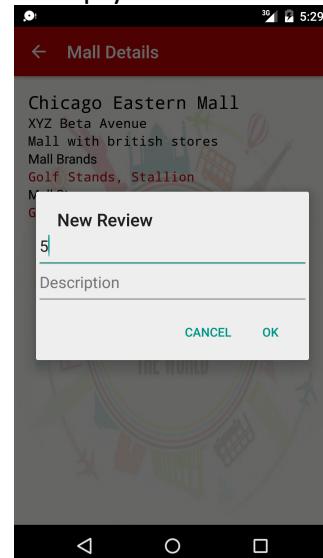
Code: MallTest04

Case Description: the score introduced by the user is out of the supported interval and the user clicks on OK.



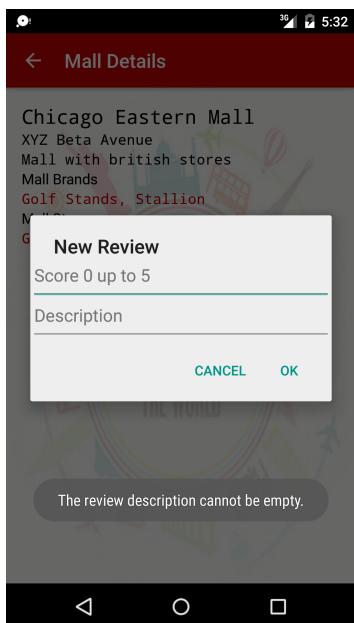
Code: MallTest05

Case Description: Description input box is empty and the user clicks on OK.



Expected Result: An error message is displayed and the dialog is re-launched.

Expected Result: An error message is displayed.

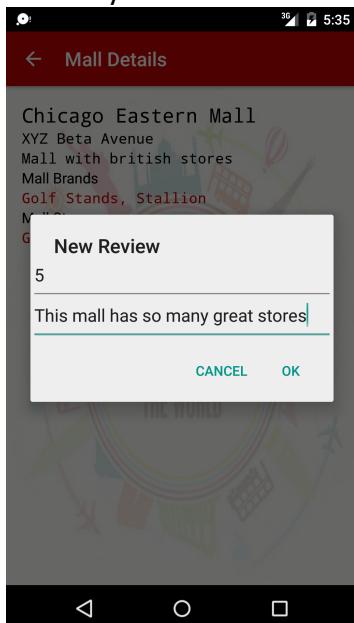


Expected Result: The new review is posted.



Code: MallTest06

Case Description: Both fields are correctly filled and the user clicks on OK.

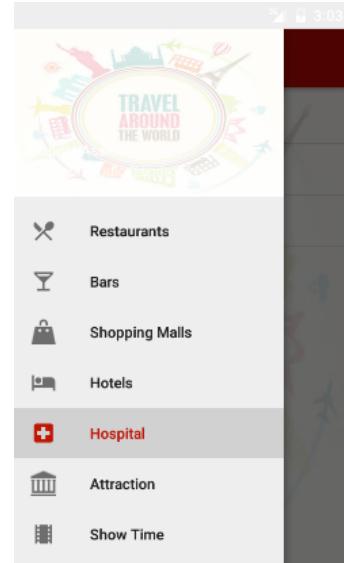


Code: MallTest07

Case Description: The user clicks on back button.



Expected Result: The Malls list is shown.



Expected Result: A new view shows the list of hospitals.

Test Code	Passed	Failed
MallTest00	Passed	
MallTest01		
MallTest02	Passed	
MallTest03		
MallTest04		
MallTest05		
MallTest06		
MallTest07	Passed	



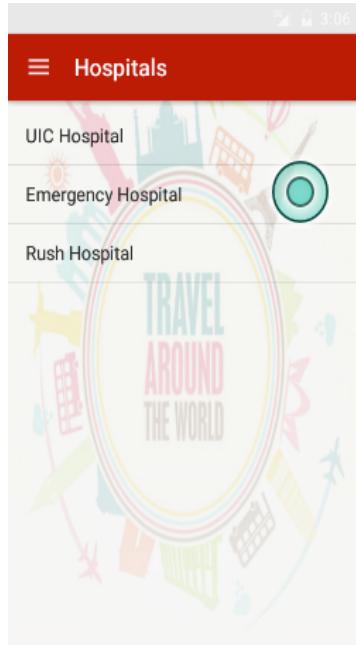
Hospitals

Code: HospTest00

Case Description: The Hospitals button is clicked on the menu.

Code: HospTest01

Case Description: One of the rows is clicked in the list of hospitals. This hospital has no reviews.

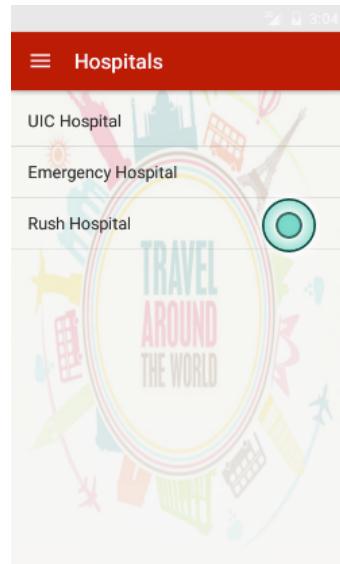


Expected Result: A new view shows the details of the associated hospital. The table of reviews is hidden.



Code: HospTest02

Case Description: One of the rows is clicked in the list of hospitals. This hospital has reviews.

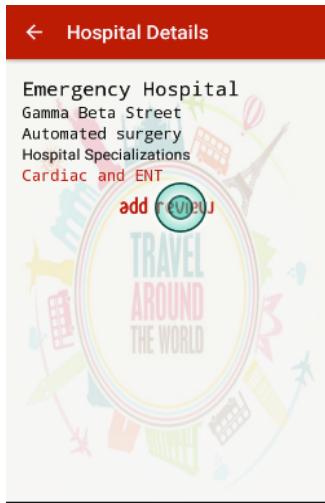


Expected Result: A new view shows the details of the associated hospital. The table of reviews is included.

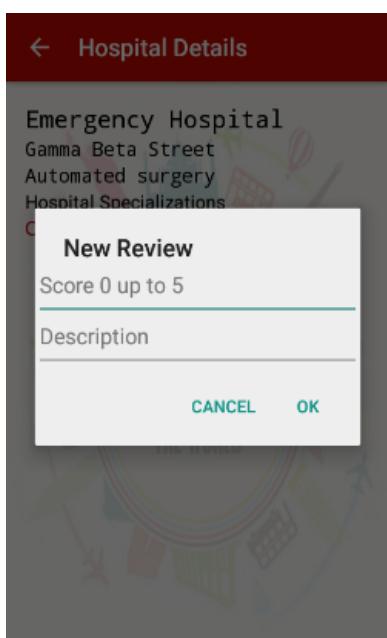
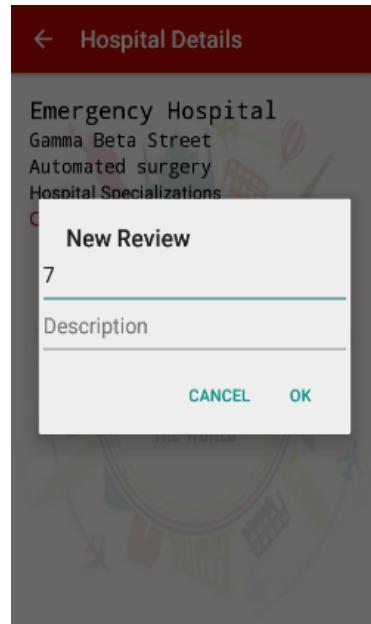


Code: HospTest03

Case Description: Add review button is clicked.



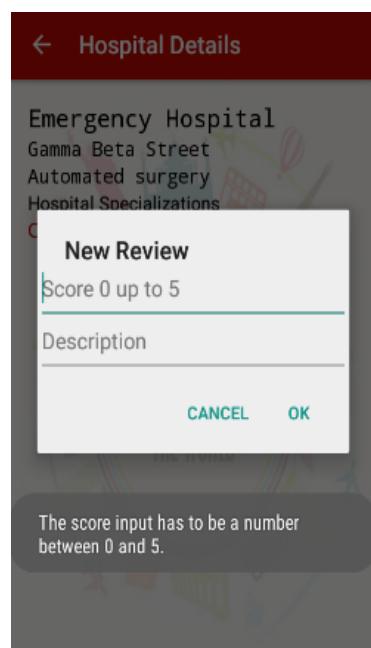
Expected Result: A review input dialog is shown.



Code: HospTest04

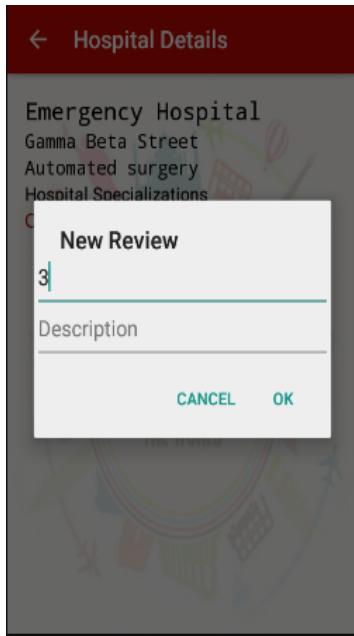
Case Description: the score introduced by the user is out of the supported interval and the user clicks on OK.

Expected Result: An error message is displayed and the dialog is re-launched.

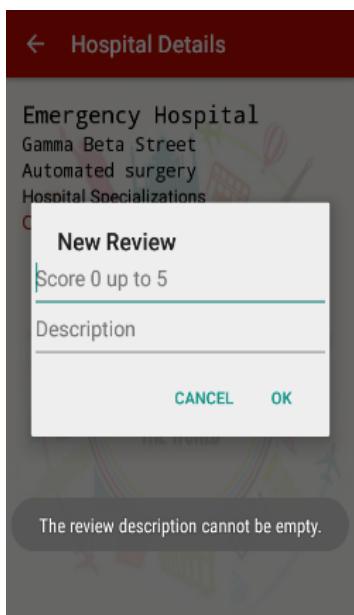


Code: HospTest05

Case Description: Description input box is empty and the user clicks on OK.

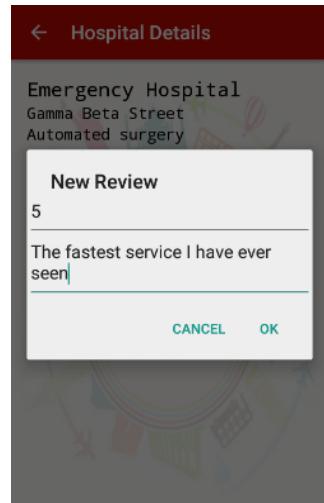


Expected Result: An error message is displayed.



Code: HospTest06

Case Description: Both fields are correctly filled and the user clicks on OK.



Expected Result: The new review is posted.

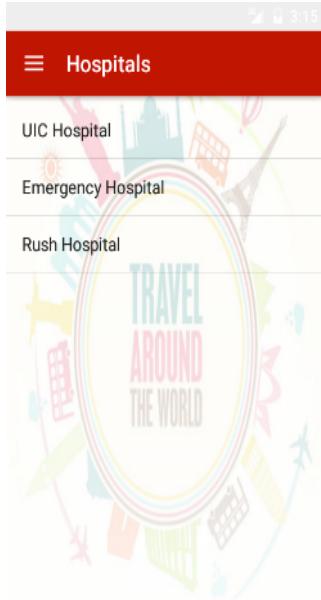


Code: HospTest07

Case Description: The user clicks on back button.



Expected Result: The hospitals list is shown.

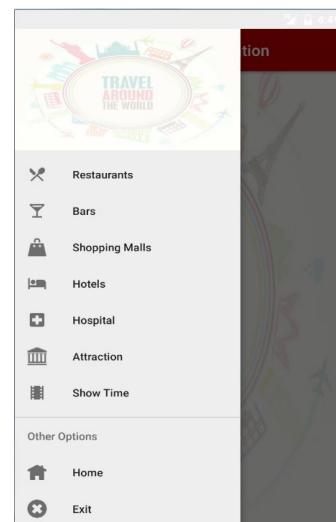


Test Code	Passed	Failed
HospTest00	Passed	
HospTest01		
HospTest02		
HospTest03		
HospTest04		
HospTest05		
HospTest06		
HospTest07		

Hotels

Code: HotelTest00

Case Description: The Hotels button is clicked on the menu.

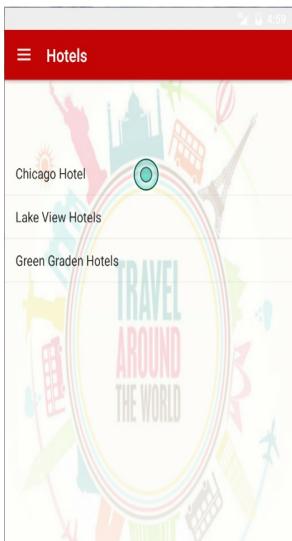


Expected Result: A new view shows the list of Hotels.



Code: HotelTest01

Case Description: One of the rows is clicked in the list of Hotels. This Hotel has reviews.



Expected Result: A new view shows the details of the associated Hotel. The table of reviews is included.

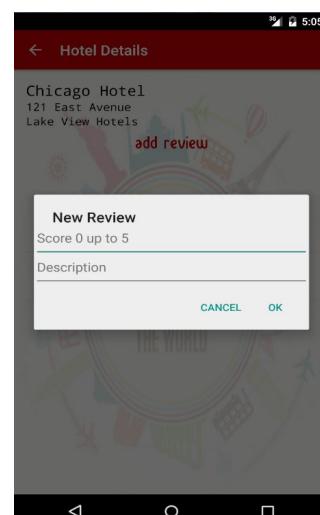


Code: HotelTest02

Case Description: Add review button is clicked.

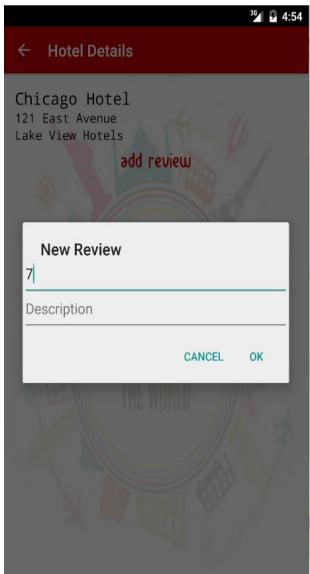


Expected Result: A review input dialog is shown.

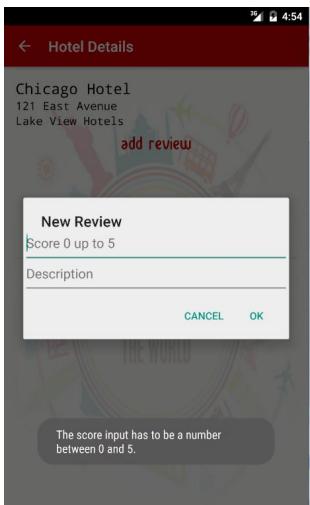


Code: HotelTest03

Case Description: the score introduced by the user is out of the supported interval and the user clicks on OK.

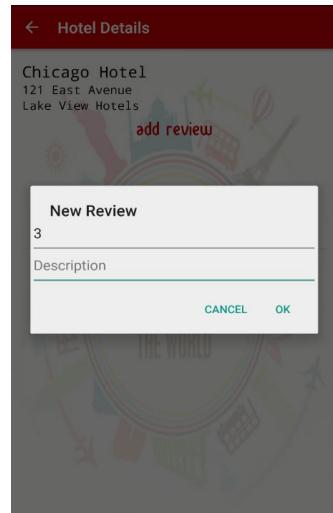


Expected Result: A toast message with error is displayed and the dialog is re-launched.

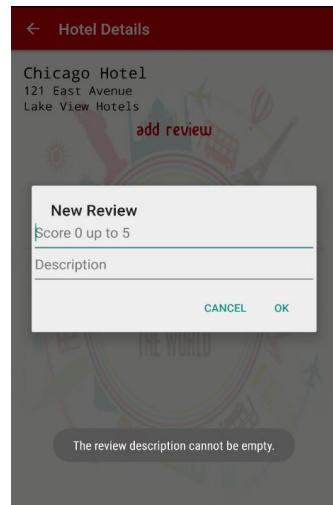


Code: HotelTest04

Case Description: The score is in the interval but the description input box is empty and the user clicks on OK.

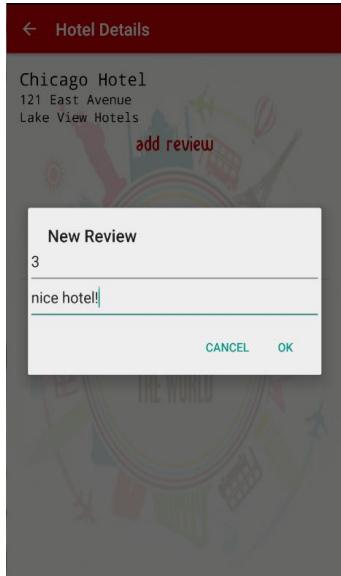


Expected Result: A toast message with error is displayed.



Code: HotelTest05

Case Description: Both fields are correctly filled and the user clicks on OK.



Expected Result: The new review is posted.

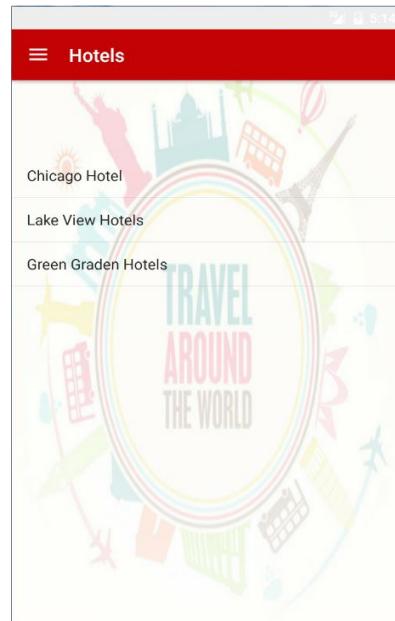


Code: HotelTest06

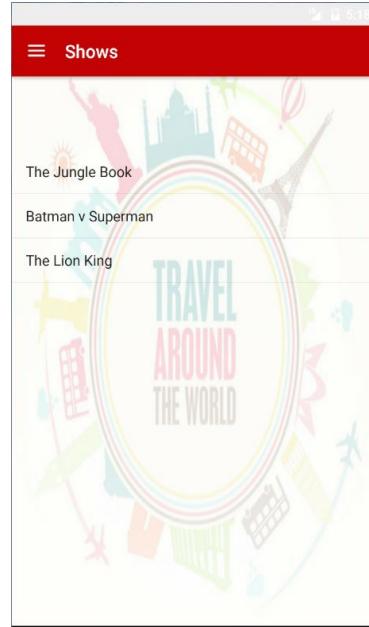
Case Description: The user clicks on back button.



Expected Result: The Hotels list is shown.



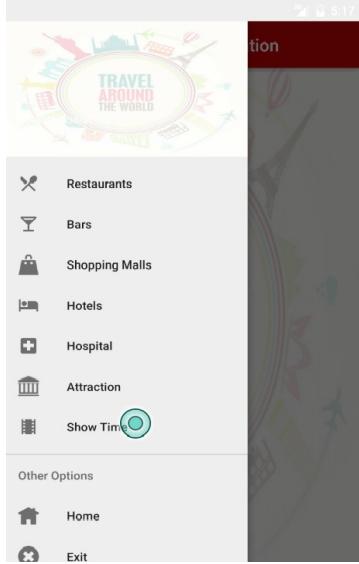
Test Code	Passed	Failed
HotelTest00		
HotelTest01		
HotelTest02		
HotelTest03		
HotelTest04		
HotelTest05		
HotelTest06		



Show times

Code: ShowTest00

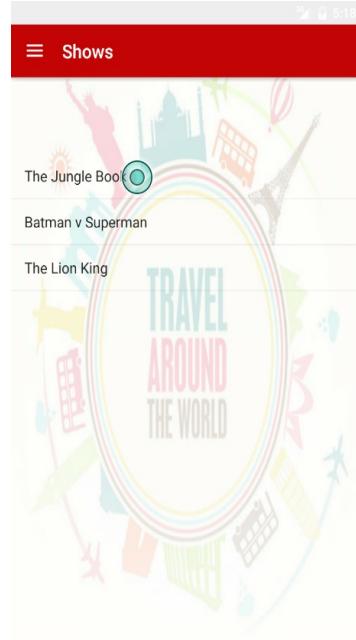
Case Description: The Showtimes button is clicked on the menu.



Expected Result: A new view shows the list of Showtimes.

Code: ShowTest01

Case Description: One of the rows is clicked in the list of Showtimes. This Showtime has reviews.



Expected Result: A new view shows the details of the associated Showtime. The table of reviews is included.

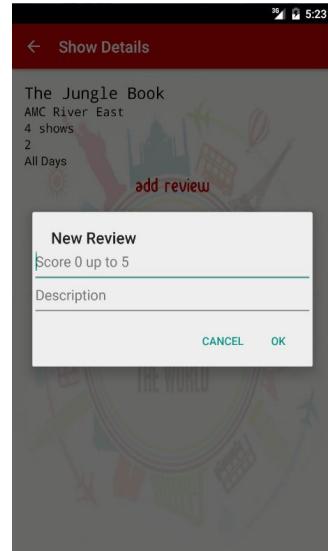


Code: ShowTest02

Case Description: Add review button is clicked.

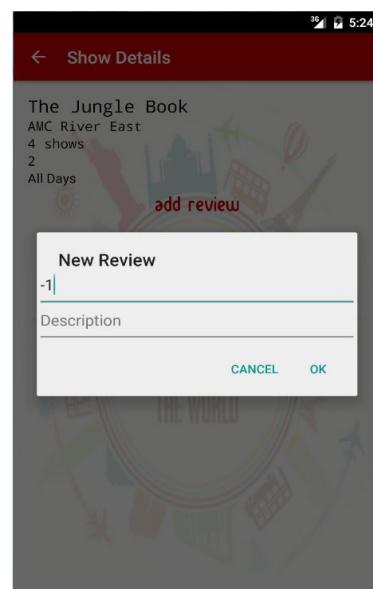


Expected Result: A review input dialog is shown.

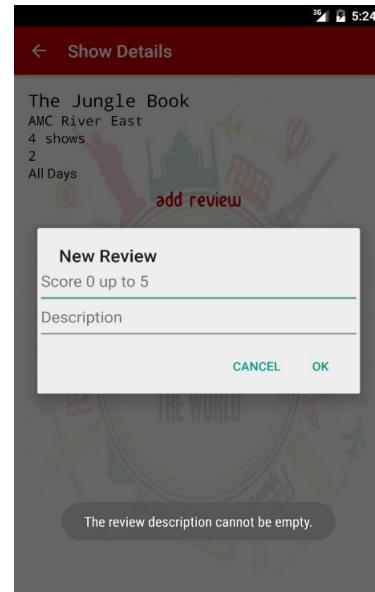
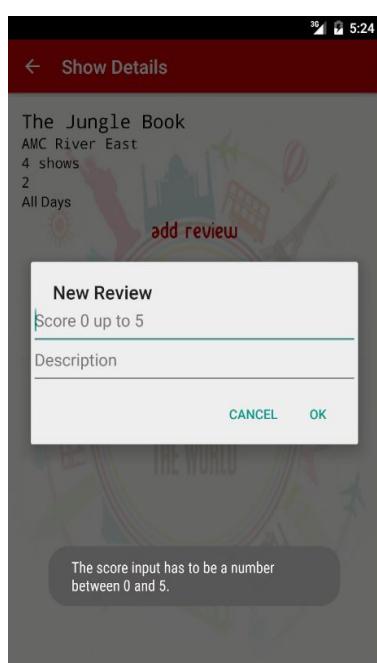


Code: ShowTest03

Case Description: the score introduced by the user is out of the supported interval and the user clicks on OK.

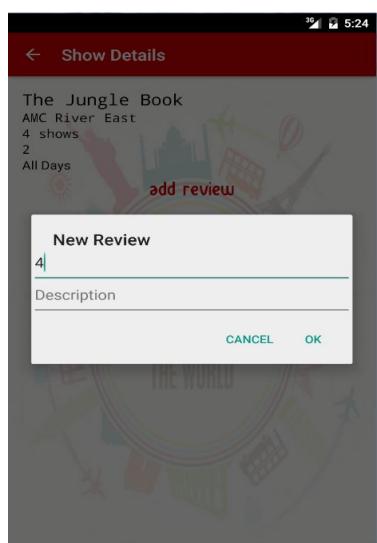


Expected Result: An error message is displayed and the dialog is re-launched.



Code: ShowTest04

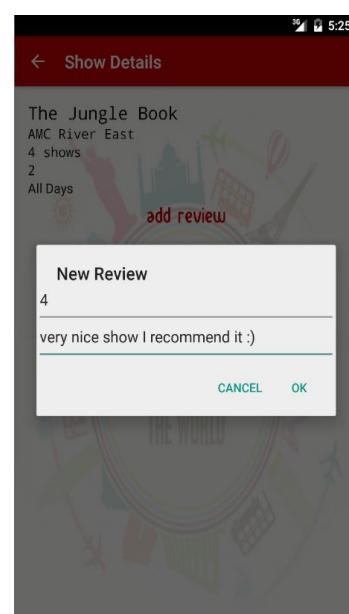
Case Description: Description input box is empty and the user clicks on OK.



Expected Result: An error message is displayed.

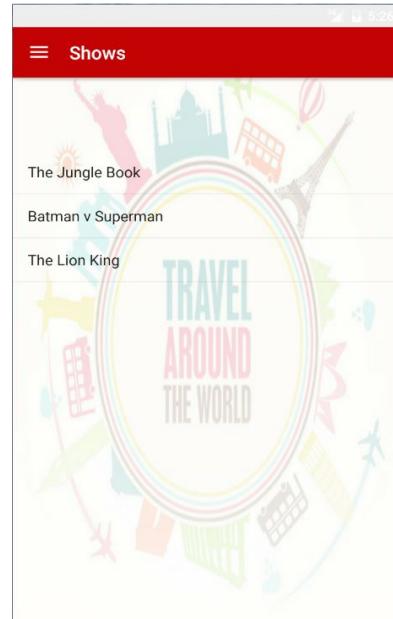
Code: ShowTest05

Case Description: Both fields are correctly filled and the user clicks on OK.



Expected Result: The new review is posted.

Expected Result: The Showtimes list is shown again.



Code: ShowTest06

Case Description: The user clicks on back button.

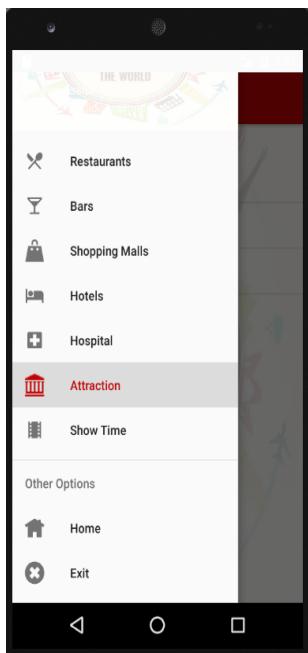


Test Code	Passed	Failed
ShowTest00		
ShowTest01		
ShowTest02		
ShowTest03		
ShowTest04		
ShowTest05		
ShowTest06		

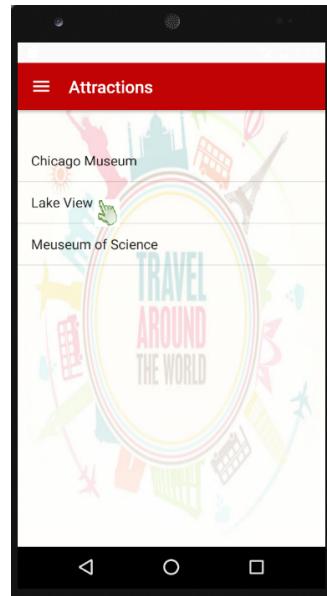
Attractions

Code: AttractionTest00

Case Description: The Attraction button is clicked on the menu.



Expected Result: A new view shows the list of attractions.

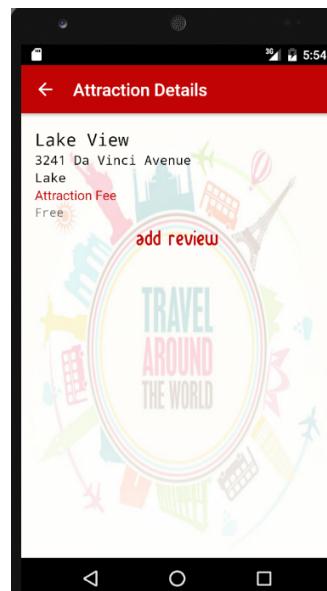


Expected Result: A new view shows the details of the associated attraction. The table of reviews is hidden.



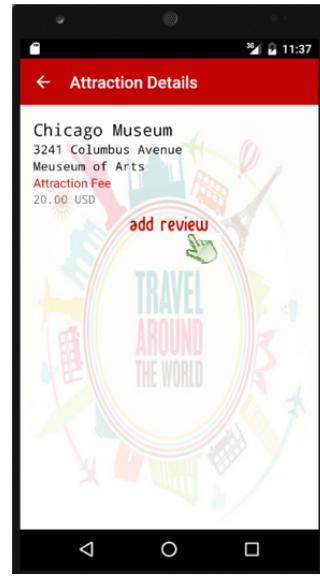
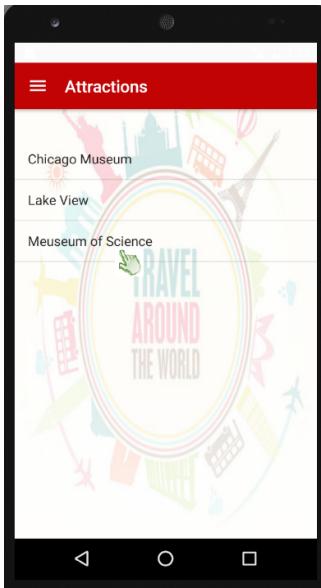
Code: AttractionTest01

Case Description: One of the rows is clicked in the list of attractions. This attraction has no reviews.

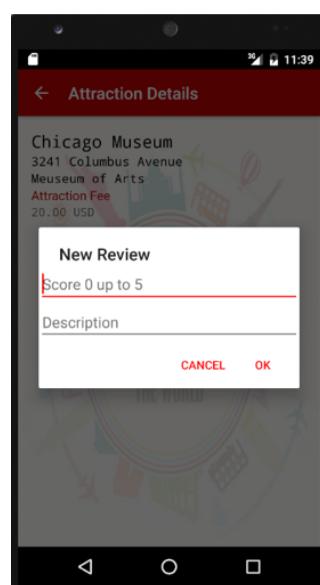


Code: AttractionTest02

Case Description: One of the rows is clicked in the list of attractions. This attraction has reviews.



Expected Result: A new view shows the details of the associated attraction. The table of reviews is included.

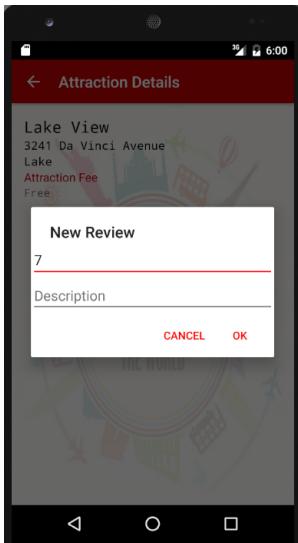


Code: AttractionTest04

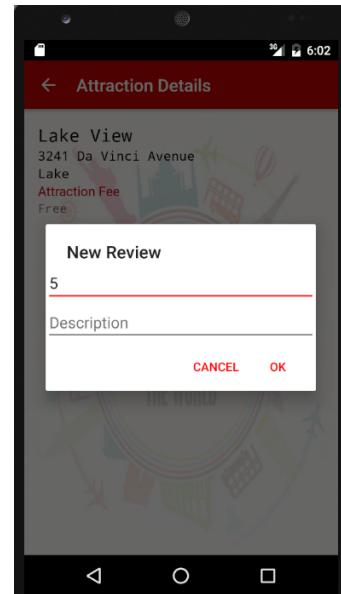
Code: AttractionTest03

Case Description: Add review button is clicked.

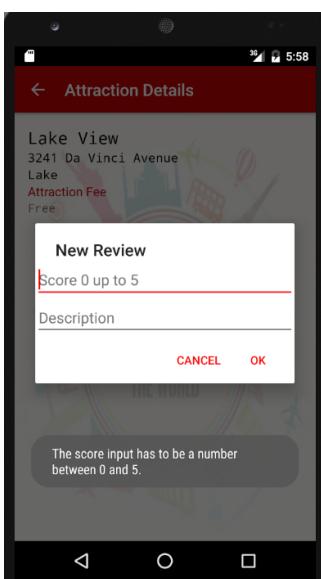
Case Description: the score introduced by the user is out of the supported interval and the user clicks on OK.



Expected Result: An error message is displayed and the dialog is re-launched.

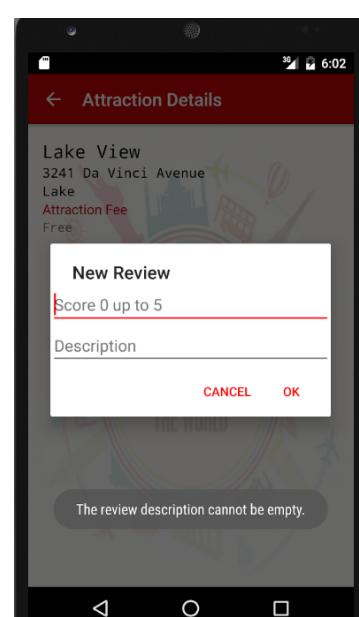


Expected Result: An error message is displayed.



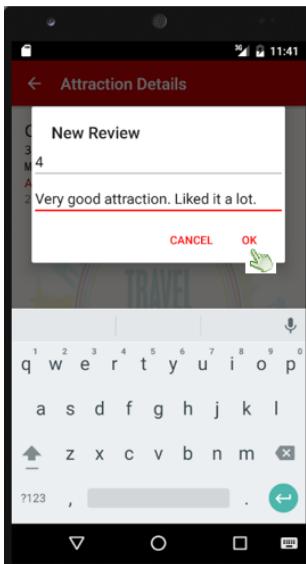
Code: AttractionTest05

Case Description: Description input box is empty and the user clicks on OK.



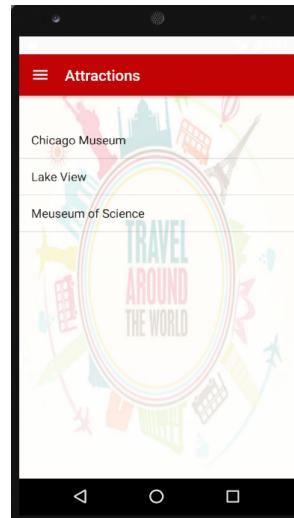
Code: AttractionTest06

Case Description: Both fields are correctly filled and the user clicks on OK.



Expected Result: The new review is posted.

Expected Result: The attractions list is shown.



Code: AttractionTest07

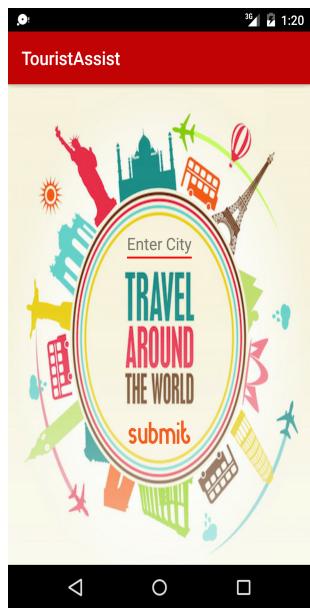
Case Description: The user clicks on back button.

Test Code	Passed	Failed
AttractionTest00		
AttractionTest01		
AttractionTest02		
AttractionTest03		
AttractionTest04		
AttractionTest05		
AttractionTest06		
AttractionTest07		

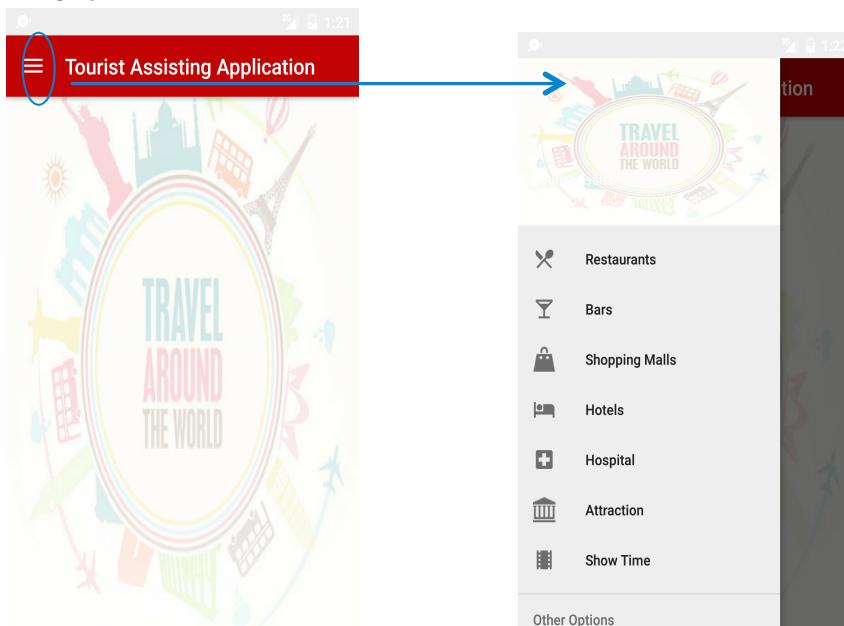
User Guide

Main Screen

When the Application is first opened The users will have to enter the name of the they are for information about and then click on submit



The user would then be taken to a screen when he could click on the left side of the toolbar and navigate through places



Restaurant

In the Restaurants menu the user can find a list of the restaurant available in the selected city.

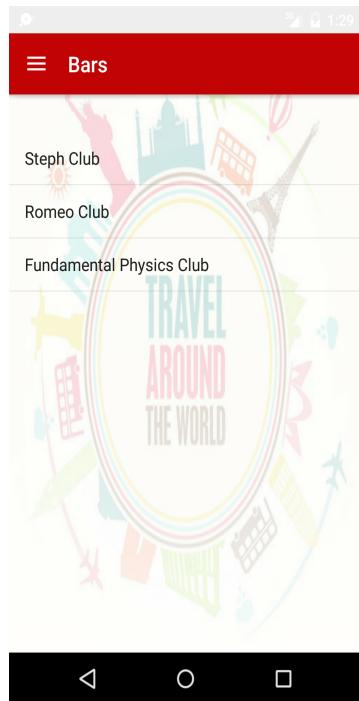


If one of the rows is clicked on, the application will move to a new screen that shows a list of details about the selected restaurant: address, information, Cuisines and reviews.



Bar

In the Bars menu the user can find a list of the bars and clubs available in the selected city.



If one of the rows is clicked on, the application will move to a new screen that shows a list of details about the selected bar: address, description, disco/no disco and reviews.



Shopping Malls

In the Shopping Malls menu the user can find a list of the malls available in the selected city.



If one of the rows is clicked on, the application will move to a new screen that shows a list of details about the selected mall: address, information, brands, stores and reviews.

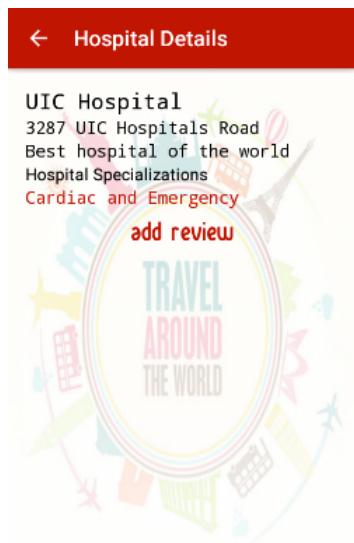


Hospitals

In the Hospitals menu the user can find a list of the hospitals available in the selected city.

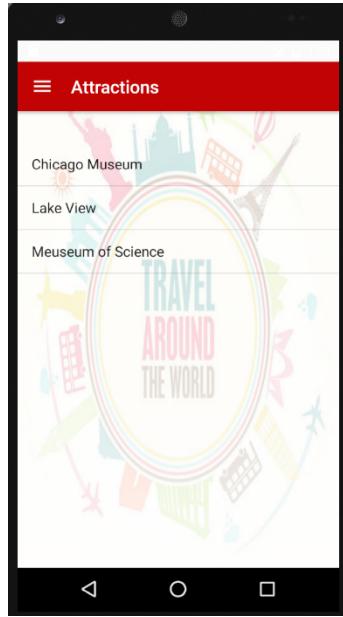


If one of the rows is clicked on, the application will move to a new screen that shows a list of details about the selected hospital: address, description, specializations and reviews.



Attraction

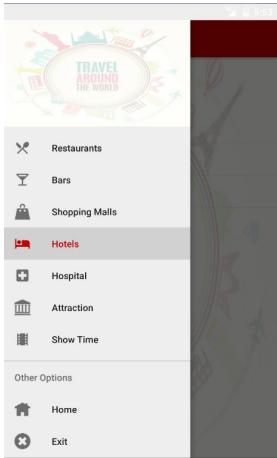
In the Attraction menu the user can find a list of the Attraction and clubs available in the selected city.



If one of the rows is clicked on, the application will move to a new screen that shows a list of details about the selected attraction: address, description, fee and reviews.



Hotels



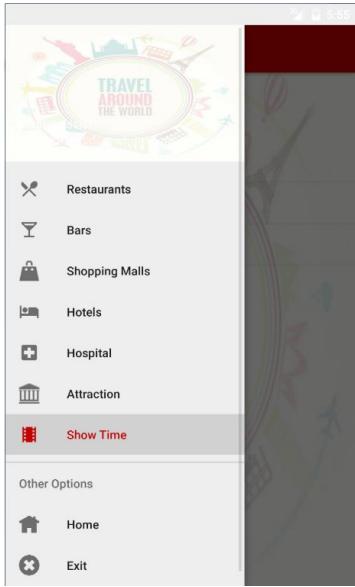
In the Hotels menu the user can find a list of the Hotels available in the selected city.



If one of the rows is clicked on, the application will move to a new screen that shows a list of details about the selected hotel: address, description and reviews.



Show Times



In the Show times menu the user can find a list of the shows and movies available in the selected city.

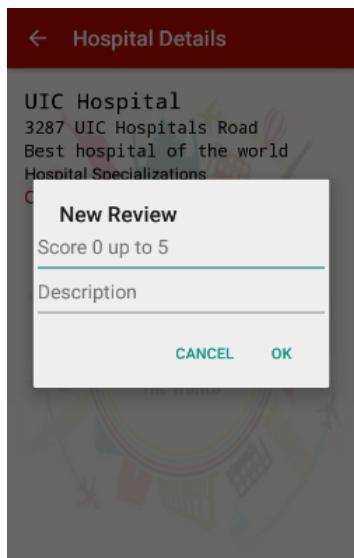


If one of the rows is clicked on, the application will move to a new screen that shows a list of details about the selected show time: address, description, duration, days of show and reviews.

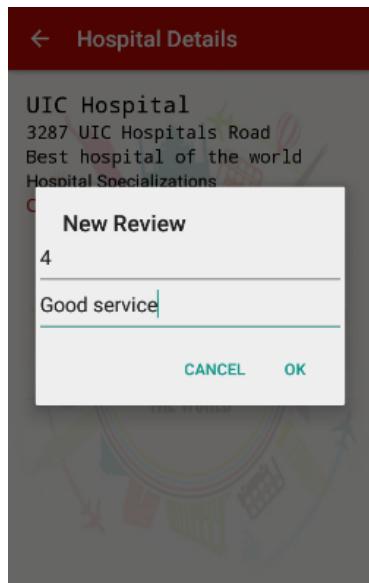


Reviews

By clicking on the button “ADD REVIEW” it is possible to rate the hospital and write a review in any of the categories.



The inputted rating score has to be a number between 0 and 5 and the description cannot be left blank.

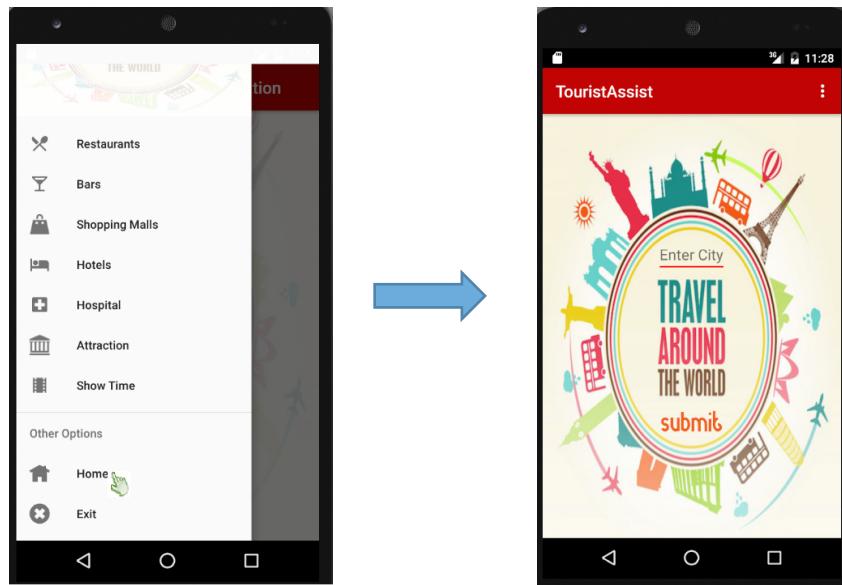


If both requisites are met, the review will be sent to the server and immediately posted:

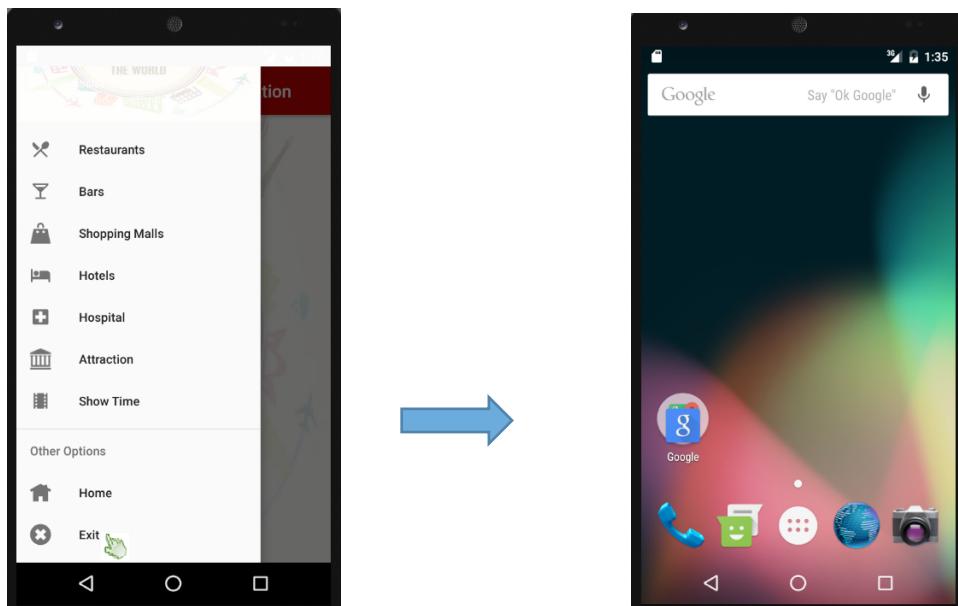


Other Options

On scrolling down in the Navigation bar user can get in to Main Page of the application by clicking on 'Home' Button



Similarly on user can exit from the application by clicking on 'Exit' Button which takes to the home screen of the phone.



Developer Guide

Setting up the Database and Backend Services.

Database Setup Guide

Clone the repository using the git clone and use the repository url to get the latest code. You can either create your own database, MySQL or use the RDS provided by the AWS. In this project we have used RDS services of AWS to host a MySQL server. If you are setting up your own server and not using the project default server, you will need to run the DB scripts which are located in the TA_DB_SCRIPTS. The TA_DB_SCRIPT folder further contains two other folders which contain the Table creation scripts and the Seed data script.

It is advisable to create the tables using the scripts provided in the TA_DB_SCRIPT /TABLES folder and then seed your tables with the data using TA_DB_SCRIPT/SEED_SCRIPTS. The process discussed should be enough to run your database.

If you are going to be using the schema which is created by the team from the AWS, you will need following connection details.

Database URL: stiwari5-cluster.cluster-cltssb30vxlo.us-east-1.rds.amazonaws.com

Port: 3306

Username: ta_user

Schema: tourist_assist

These details will also be used in DBConnectionManager.java file which we are going to discuss in further sections of the report.

For Entity Relationship diagram please refer to the DB diagram drawn in the Design report.

Backend Services:

Overview and Running Services

The services are exposed as SOAP, by its nature SOAP uses XML information set to send and receive the message. The mobile clients use the “org.ksoap2” libraries to make sure they send and receive the information to the services as per the specification.

In our services we use JAX-WS specification which is a specification laid out by the Java API for XML web services.

To run the web services, the developers can make use of Weblogic or the tomcat server. For our development purpose the team has used jdeveloper which is an IDE that comes up with an integrated weblogic server. The version of the IDE is 12c and is free to download using Oracle developer download program.

If you are using the jdeveloper, just rightclick on the ToursitAssist.java file and run them as webservice. The process will automatically start the weblogic server and will deploy the war file that includes your services.

The same war file can be used in deploying it to the tomcat server with minimal changes in WEB-INF/weblogic.xml and replacing the content with WEB-INF/web.xml

Description of Backend Services

This section explains the usage of each file in the order of their appearance in the flow of code as mobile devices and emulators make request to the server.

As soon as the client makes a call to the server, the weblogic server redirects the request XML and parses it in the form of objects and sends it to the exposed file which goes by the name of TouristAssistService.java

TouristAssistService

This file is responsible for accepting request and response from the clients. It has all of its method which are exposed public and they directly deal with the webservice infrastructure of the weblogic server.
Sample web service method in the code.

```
@WebMethod  
public CityResponse getCityFromCityName(@WebParam(name = "arg0") String cityName) {  
    ResponseBuilder responseBuilder = new ResponseBuilder();  
    return responseBuilder.getCityFromCityName(cityName);  
}
```

ResponseBuilder

The next file in the flow of code is ResponseBuilder.java which takes care of the response and helps in building responses which are pulled from the database. ResponseBuilder class holds different types of Response which further hold the array of objects.

For example, ResponseBuilder will return RestaurantResponse and RestaurantResponse class will have array of Restaurants with their details in it.

Following is an example of ResponseBuilderMethod

```
public RestaurantResponse getRestaurants(String cityId) {  
    RestaurantResponse restaurantResponse = new RestaurantResponse();  
    restaurantResponse.setRestaurants(genResponse.getRestaurants(cityId));  
    return restaurantResponse;  
}
```

GenResponses

The file GenResponses.java is responsible for making a call to the DBConnectionManager and parse the result into the Array Objects and return the array to the ResponseBuilder class. The GenResponses class also has a facility in which it returns dummy data in case no data is available. This is controlled by a variable, isDBDataAvailable, which is Boolean in nature, and to be set false in case of no database availability. If the DB is not available, the services will return a dummy data.

Following is an excerpt from the GenResponses class.

```
public Review[] getReviews(String entityId) {
    ArrayList<Review> reviews = new ArrayList<Review>();
    if (!isDBDataAvailable) {
        reviews.add(new Review("020", "004", "3.5", "Very nice Place"));
        reviews.add(new Review("021", "006", "4", "Awesome Place"));
        reviews.add(new Review("022", "010", "5", "Best Place"));
    } else {
        SQLAggregatedConnectionObjects sqlObjects = new SQLAggregatedConnectionObjects();
        String query = "select * from REVIEWS where ET_ID=" + entityId;
        sqlObjects = connectionMgr.fetchResultSetFromQuery(query, sqlObjects);
        ResultSet resultSet = sqlObjects.getResultSet();
        try {
            while (resultSet.next()) {
                String REVIEW_id = resultSet.getString("REVIEW_id"), ET_ID =
                    resultSet.getString("ET_ID"), REVIEW_RVW = resultSet.getString("REVIEW_RVW"), REVIEW_RATING =
                    resultSet.getString("REVIEW_RATING");
                reviews.add(new Review(REVIEW_id, ET_ID, REVIEW_RATING, REVIEW_RVW));
            }
        } catch (SQLException e) {
            e.printStackTrace();
        } finally {
            try {
                connectionMgr.closeConnectionObjects(sqlObjects);
            }
        }
    }
}
```

DBConnectionMgr

This is the class which is responsible for making Database connection and return the SQLAggregatedObjects to the caller by connecting to the DB and calling DB connections. It has two methods one which inserts and updates the data and the other that just fetches certain data based on the query.

The two methods:

1. fetchResultSetFromQuery
2. insertOrUpdateObjectsUsingQuery

The reason for making these two methods different was because fetching a data involves result set while the other just returns a value in the Statement object of SQL Aggregated objects

The following is the screenshot of the fetchResultSetFromQuery method.

```

public static SQLAggregatedConnectionObjects fetchResultSetFromQuery(String query, SQLAggregatedConnectionObjects
    try {
        Class.forName(JDBC_DRIVER);

        sqlObjects.setConnection(DriverManager.getConnection(DB_URL, USER, PASS));
        sqlObjects.setStatement(sqlObjects.getConnection().createStatement());
        sqlObjects.setResultSet(sqlObjects.getStatement().executeQuery(query));

    } catch (ClassNotFoundException e) {
        e.printStackTrace();
    } catch (SQLException e) {
        e.printStackTrace();
    }
    return sqlObjects;
}

```

JUnits

TouristAssistServiceTest

The project has an extensive coverage of JUnits. The JUnits test whether a certain service is working independently of the servers or not. The excerpt of the code shows a sample method of the JUnit test case.

```

/**
 * @see com.cs.se.ta.main.TouristAssistService#getReviews(String)
 */
@Test
public void testGetReviews() {
    try {
        TouristAssistService touristAssistService = new TouristAssistService();
        ReviewResponse reviewResponse = touristAssistService.getReviews("017");
        if(reviewResponse.getReviews().length != 0){
            assertTrue("Success", true);
        } else {
            fail("No records found");
        }

    } catch (Exception e) {
        e.printStackTrace();
        fail("Failure");
    }
}

```

It makes a call to the service and checks whether for a given entity id the response is there or not. If the array returned is of the size zero, then it returns failure otherwise success is displayed.

Other Supporting Files.

Response Holders: Response Holders are specific to each module like RestaurantResponse, ClubResponse, HotelResponse, City etc. They contain the array of ResponseObjects retrieved from the database or static implementation.

Response Objects: Response Objects fill the response holders and they are generally returned in the form of Arrays and are set in the Response Holders. They are mostly by the name of Hotel, Restaurant, Club, City etc.

The Users making changes in the services are requested to follow the same pattern of development as it is explained in this developer guide. To make any architectural changes please discuss it with the team before implementing it.

Please refer to the sequence diagram in the project report for more details.

Future Work

This project has resulted on a working prototype of the application, and some of the future work that might need to be done on the application would be done on two parts:

On the WebServices:

- Integrate the Model Objects with ORM to remove the text based queries.
- Add services for finding city by coordinates
- Add services for finding city by cityId
- Auto-suggest services which fetch likely spelled cities.
- Add SQL sanitization.
- Write Manual Exception mechanism to propagate business exceptions.
- Store the Average of all the reviews.
- Add support for User level data like personal reviews and ratings and cities/places visited.

On the User Interface:

- Enable auto suggestion of city names
- Adding a map based search and find support
- Adding user profile and security features
- Personalized reviews and arrange them by descending order of rating.
- Maintaining history of a user data