

ID 2216 - Developing Mobile Applications

Assignment – 2 (Prototypes)

Project Report – Traveling Salesman Application



Group 6: The Super Group

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Introduction

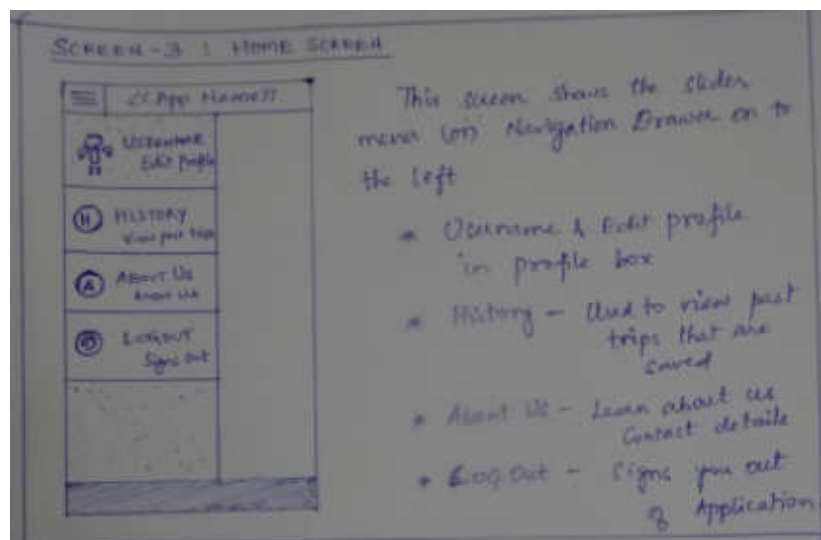
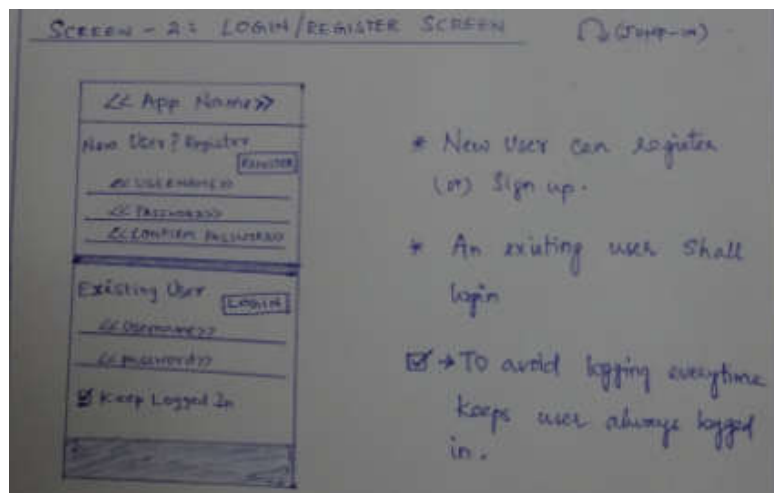
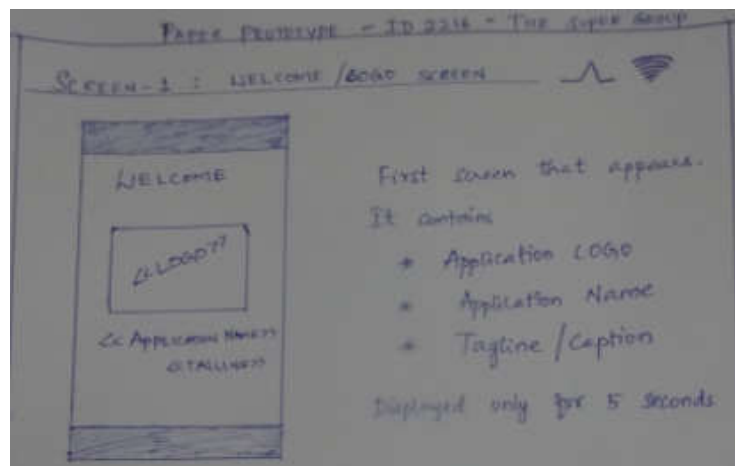
In this report, we present the further developments and progress of our project. After many rounds of discussions on the proposal and its design and implementation aspects, we came up with the following prototypes that gives an iota of our final functional mobile application. The report summarizes the transformation of application design grouped under various sections – Paper prototype, testing with real-users and their feedback, clickstreams and sitemap, revised paper prototype developed using Balsamiq followed by the Web App prototype, testing and observations. Each team member has significantly contributed to various tasks and have actively participated in all the discussions.

Paper Prototype Design

After finalizing our project proposal, we started off with “*Requirements Gathering*” on what services has to be provided and what options should appear on the User Interface. Initially, we developed a basic prototype on paper. To start with, we decided to have the following screens:

- 🚦 **Title Screen:** Contains Application Name, Logo and a short, catchy and self-descriptive tagline. Title screen shall be displayed for 2-3 seconds and then the user will be redirected to the next screen.
- 🚦 **Login Screen:** This is the next screen which allows the new users to sign up and existing users to login by providing a valid username and password. After successful login, the user will reach the Home screen.
- 🚦 **Home Screen:** This is the main screen of the application that houses majority of the options. To begin with, it will have:
 - A Hamburger Menu button on the upper left corner that pops up the navigation slider (side menu) with options such as User Profile, History (Past/Saved Trips), About Us and Log Out. Each option shall display the corresponding screens with relevant options.
 - Below the action bar are two radio buttons that allow user to select the trip type i.e., Round trip or Single straight trip.
 - Following the radio buttons, there will be a text field to accept the starting location. Below that the user can specify the list of places he/she wishes to cover beginning at the starting point in a Multiline text box. Moreover, Geo location shall be used to capture the current location as starting point.
 - There will also be 3 options to select the mode of travelling such as by walk, public transportation or private vehicles (say, car).
 - Lastly, there will be two buttons – RESET for clearing all the input fields (If user wishes to) and SEARCH for proceeding with tracing the optimal route for the given list of places. The resultant route shall be displayed in the Map/Navigation screen which is the next screen.
- 🚦 **Map/Navigation Screen:** This screen will show the user the most efficient travelling route covering all the desired places. On this page there will be also be an option to Mark (save) routes for future reference under past trips – option in the slider menu.

Title/Welcome Screen, Login Screen, Home Screen and Map/Navigation Screen displayed below in order.



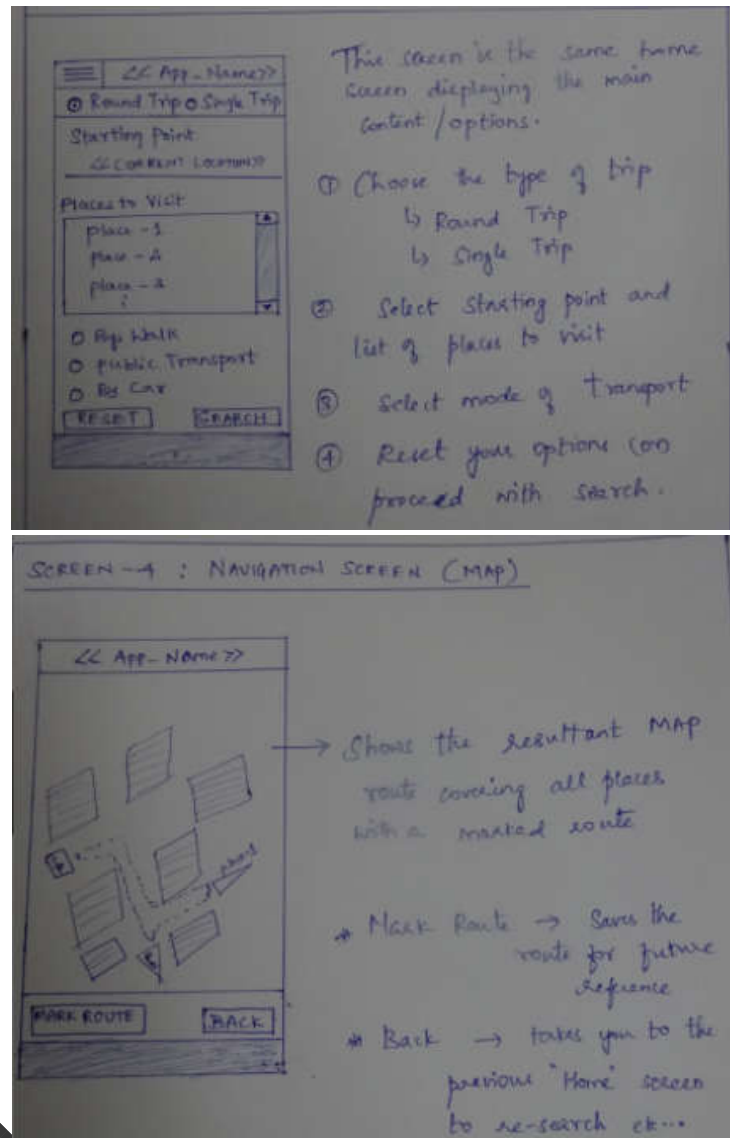


Figure 1: Home and Map Screens

As part of getting end users feedback, we started testing our basic prototypes with 4 users who love travelling and are frequent travelers. Thanks for their valuable feedback and suggestions. In addition to the potential end-user feedback, we also researched few popular travel applications and learned some good reviews posted by its users. Following is a collective summary of feedback and responses.

- ✚ In Login Screen, the bar in the middle of the Login screen is not good and pleasing.
- ✚ Forgot password option is missing.
- ✚ There could be an option to change my account settings and other choices.
- ✚ Also, it would be better if I can connect/invite my friends to use the app.
- ✚ The text area for places to visit could be replaced by some other responsive and catchy UI.
- ✚ Why don't you provide mode of transportation in the Navigation (Map) screen as users don't want to go back each time.

- ✚ It looks good but it could be more stylish.
- ✚ Having a good tagline and Logo is very important to catch our attention.
- ✚ Looks decent but could be improved in terms of design and aesthetics.

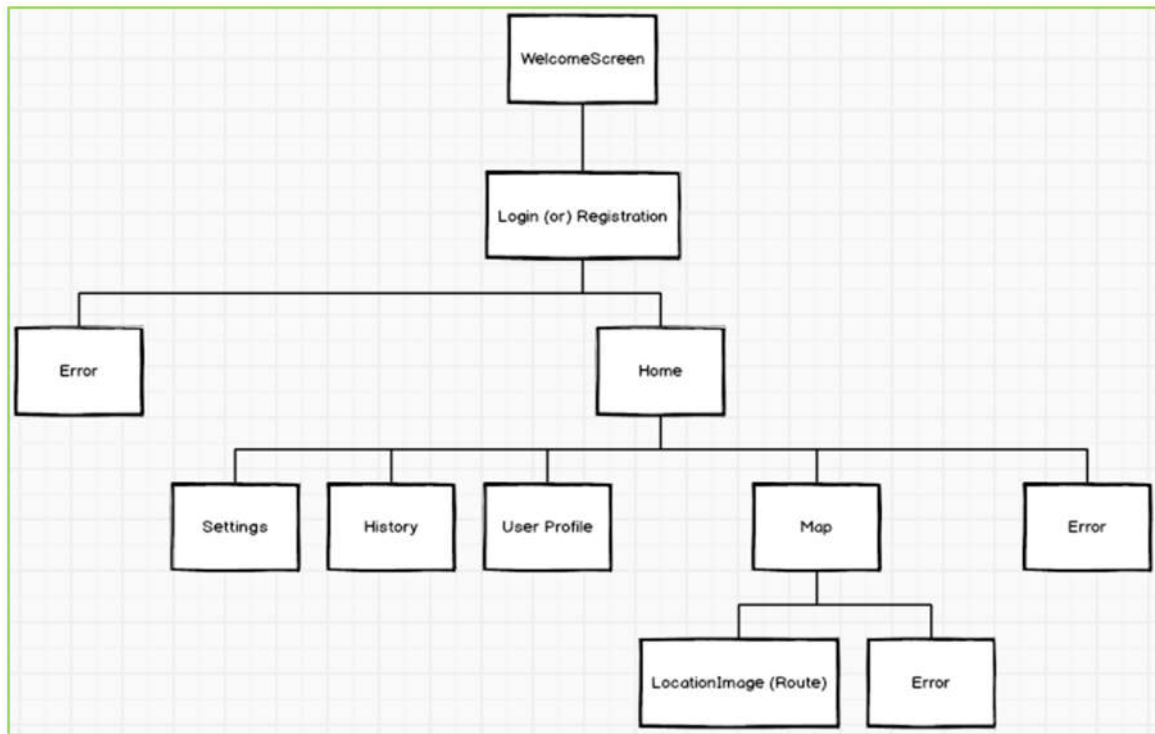
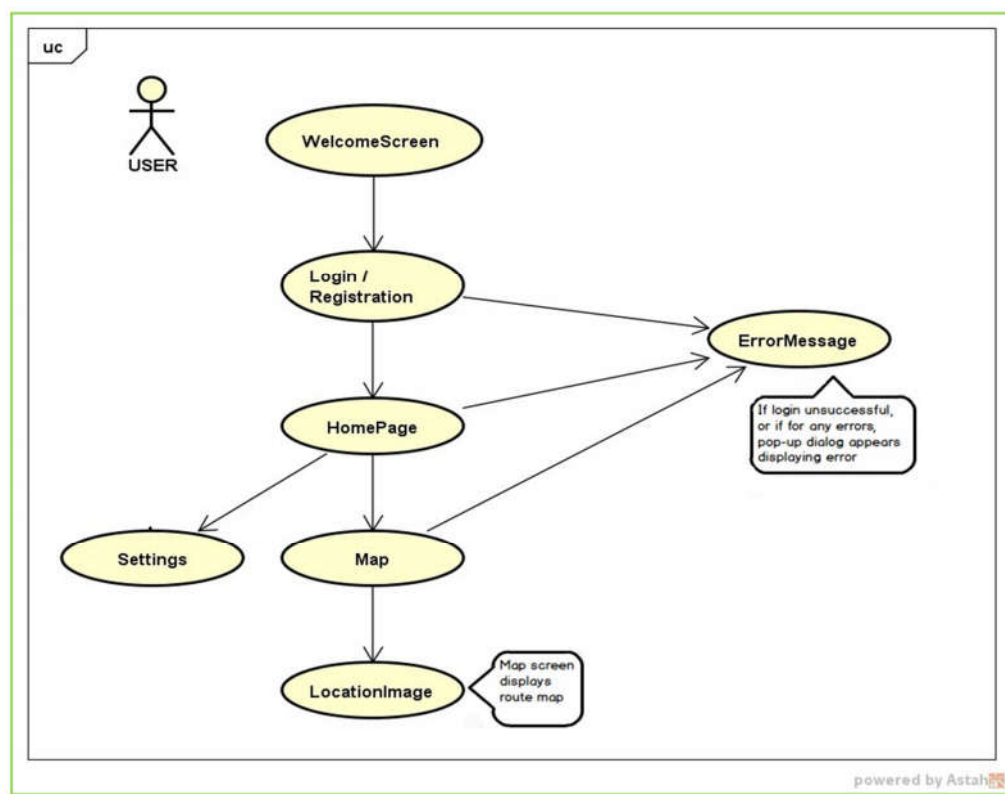
Second Prototype Design

Based on the reviews and feedback from our users, we enriched our application with better UI elements and re-designed it to make it catchier yet simple with minimal clicks and less work to the end user. As a result, we worked on enhancing our basic prototype with further improvements and designed new prototype and user flows. Following are some of the enhancements we did.

- ✚ Agreed upon defining a specific theme for our App (Visible in functional App).
- ✚ **Title Screen** – Remains unchanged.
- ✚ **Login Screen**
 - Include Forgot password option in the login screen.
 - Bar separating Login & Register options replaced with a rounded OR TextView.
- ✚ **Home Screen**
 - Added Preferences, Invite Friends/Connections options to the slider menu.
 - Replaced the Text Area for Places to Visit with a + and – buttons i.e., following the radio buttons, there will be a set of text fields to accept the starting location and at least one destination. To add more places of visit, we provide a small plus button clicking on which shall add a new text field for the user to enter the location. Similarly, there will be a small minus button with every newly added text field (Except the first fixed one) to remove, if the user wishes to do so.
 - Moved the mode of transportation options to the Map/Navigation screen.
 - Renamed the Reset & Search buttons to Clear and Go respectively.
- ✚ **Map/Navigation Screen**
 - The 3 modes of transportation shall be displayed at the bottom of the map using ImageButtons. By default, one of the modes will be selected. Different modes can be selected at any instance without going back to home screen.
 - Moreover, the option for saving routes will be a small save icon at upper right corner of the screen.
 - Also on the map we provide a small icon for street view options along the marked route.

A sitemap is a hierarchy of different screens or views that represent the layout of application. It is how the various options or information is organized into different views (how the views are structured). Sitemap was developed using **BALSAMIQ** software as it provides mock ups that are pretty close to the real application options.

Clickstreams represents a series of clicks/touches that defines the flow a typical user shall traverse when using the application (How the users travel between the views). Our application contains a very minimal and most required user options set to avoid overwhelming the user with unnecessary options and many clicks. Clickstream was developed using **ASTAH** due to previous working experience.

**Figure 2: Sitemap****Figure 3 (a): Clickstream using Usecase diagram**

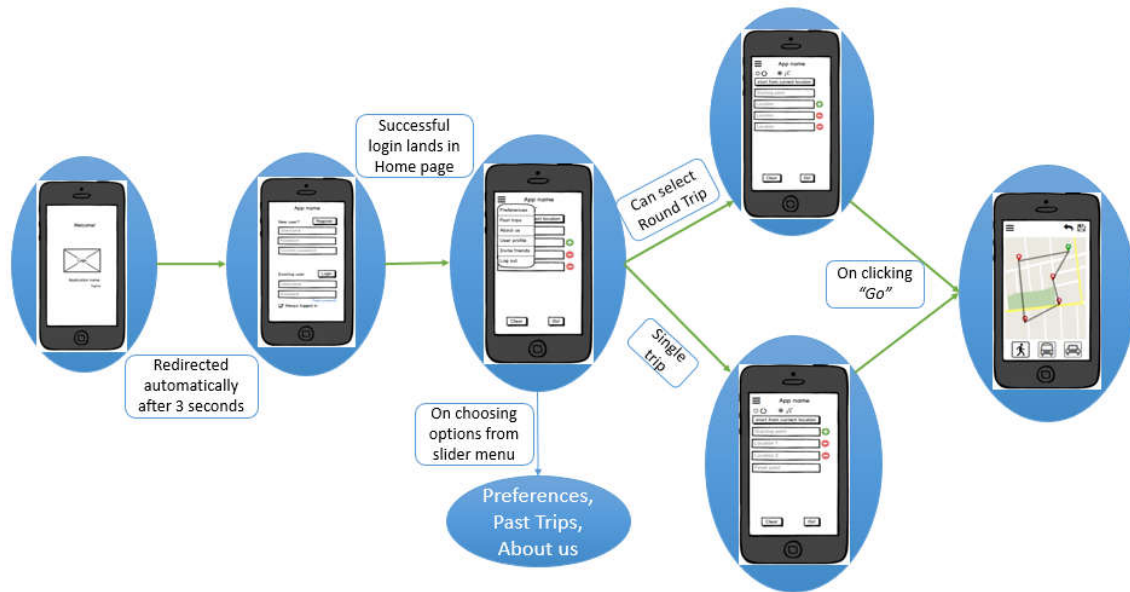


Figure 3 (b): Clickstream using Powerpoint

The prototype incorporating the real users' feedback after testing was developed using BALSAMIQ mock ups. The following figures represent the prototype screenshots of various screens.

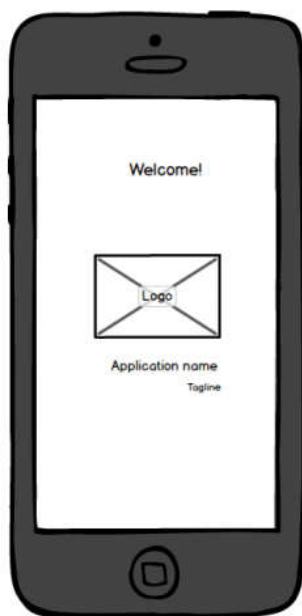


Figure 4: Title/Welcome Screen

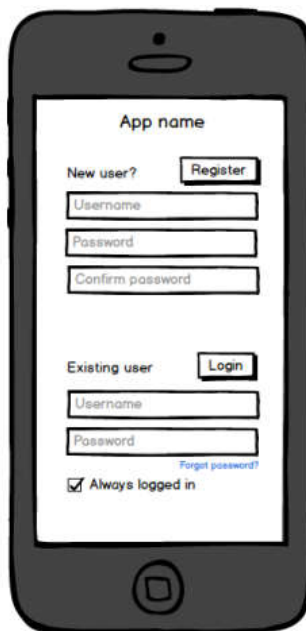


Figure 5: Login Screen

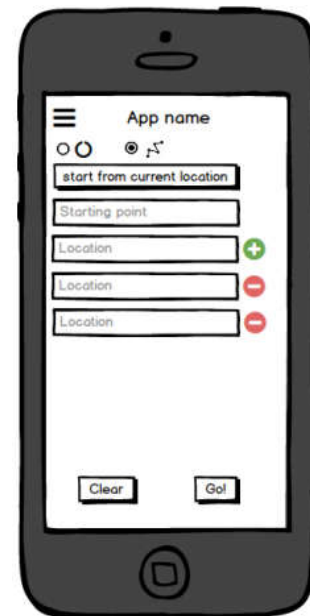


Figure 6: Home Screen

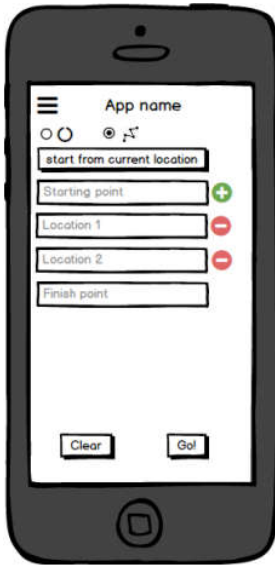


Figure 7: Home Screen
(Single Straight trip)

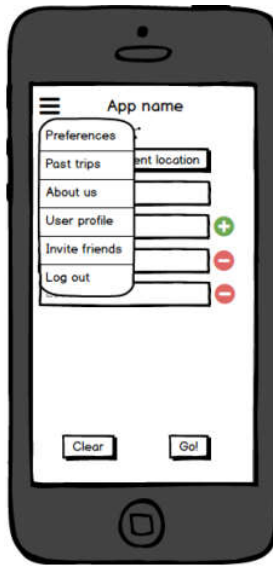


Figure 8: Home Screen
(Slider Menu)

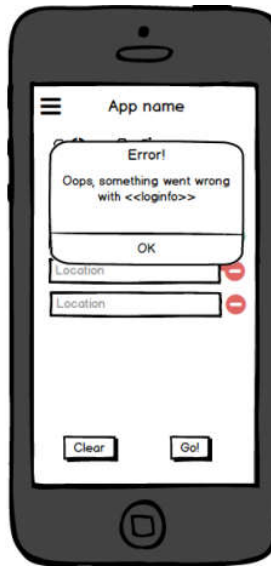


Figure 9: Home Screen
(Error Pop-up)

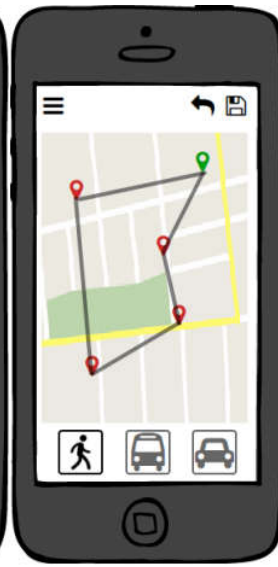


Figure 10: Map Screen
(Navigation)

Web App Prototype Design

Our major intent of developing a web application was to get more feedback from the users. With our primary intent in mind and after one round of feedback and improvement, we decided to do the Web app prototype only for the important screens which are the Home screen and the Map/Navigation screen. Having prior experience, we agreed to use JSP and Bootstrap to design our web app prototype.

Web App Prototype

The JSP pages and the implementation screenshots for the three main pages of our project are as follows. The link for the code is uploaded into the GitHub and the link is <https://github.com/rakeshgn31/UTurn-Application/commit/f9c559d1a754907c0cee1d527f3396cacca71bc0>

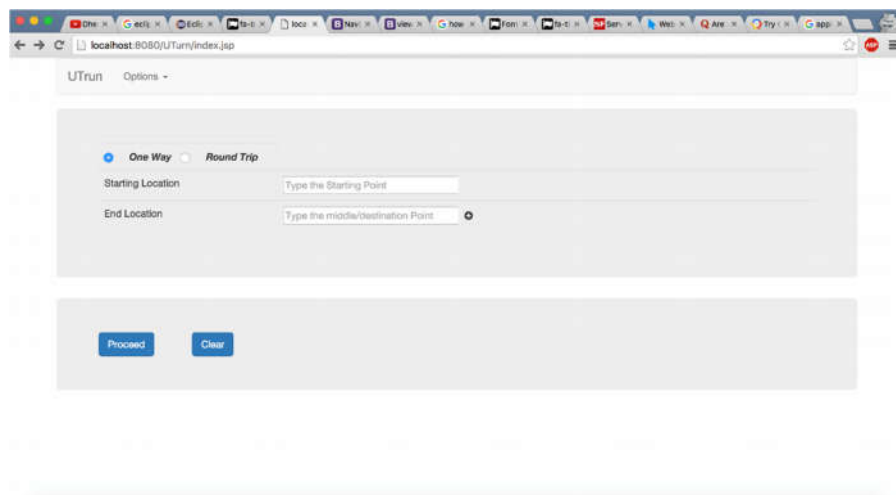


Figure 11: Home Screen (Single trip/One-way)

Figure 12: Home Screen (Round Trip options filled)

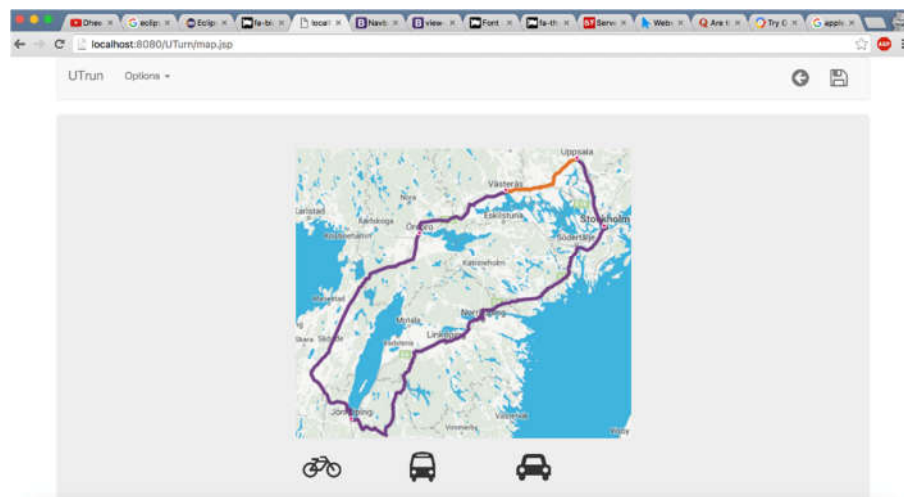


Figure 13: Map/Navigation Screen

```

9<body>
10
11<div class="container">
12
13<!-- Static navbar -->
14<nav class="navbar navbar-default">
15  <div class="container-fluid">
16    <div class="navbar-header">
17      <button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-target="#navbar" aria-expan
18        <span class="sr-only">Toggle navigation</span>
19        <span class="icon-bar"></span>
20        <span class="icon-bar"></span>
21        <span class="icon-bar"></span>
22      </button>
23      <a class="navbar-brand" href="index.jsp">UTurn</a>
24    </div>
25    <div id="navbar" class="navbar-collapse collapse">
26      <ul class="nav navbar-nav">
27        <li class="dropdown">
28          <a href="#" class="dropdown-toggle" data-toggle="dropdown" role="button" aria-haspopup="true" aria-expans
29            <ul class="dropdown-menu">
30              <li class="active"><a href="UnderConstruction.jsp">Preferences</a></li>
31              <li><a href="UnderConstruction.jsp">Past Trips</a></li>
32              <li><a href="UnderConstruction.jsp">About Us</a></li>
33              <li><a href="UnderConstruction.jsp">User Profile</a></li>
34              <li><a href="UnderConstruction.jsp">Invite Friends</a></li>
35              <li role="separator" class="divider"></li>
36              <li><a href="#">Log Out</a></li>
37            <!-- || role="separator" class="divider"></li>
38            <li class="dropdown-header">Nav header</li>
39            <li><a href="#">Separated link</a></li>
40            <li><a href="#">One more separated link</a></li>
41          </ul>
42        </li>
43      </ul>
44    </div><!-- /.nav-collapse -->
45  </div><!-- /.container-fluid -->
46</nav>
47

```

Figure 14: Home Screen JSP Implementation (1)

```

76 <script src="js/bootstrap.min.js"></script>
77 <script>
78 var rowCount = 1;
79 $("#plus").click(function(){
80   $('#table_location tr:last').after('<tr id="'+rowCount+'"><td style="width:25%;>Location</td><td style="width:7
81   rowCount++;
82   //$('#table_location').append('<tr><td style="width:25%;>Location</td></tr><td style="width:75%;><input type="
83 });
84
85 function minus(count){
86   //alert("Clicked");
87   $('#'+count).remove();
88 }
89
90 function proceed(){
91   window.location = "map.jsp";
92 }
93
94
95 function radioSelect(){
96   var selectedVal = "";
97   var selected = $("input[type='radio'][name='optradio']:checked");
98   /*if (selected.length > 0) {
99     selectedVal = selected.attr();
100   }*/
101   alert(selected);
102 }
103
104 $("input:radio[name=optradio]").click(function() {
105   var val = $("input:radio[name=optradio]:checked").val();
106   if(val == 'round'){
107     $('#label_end_loc').text("Location");
108   }else if(val == 'oneway'){
109     $('#label_end_loc').text("End Location");
110   }
111 });
112 </script>
113 </body>
114 </html>

```


Figure 15: Home Screen JSP Implementation (2)

```

39 <li><a href="#">Separated link</a></li>
40 <li><a href="#">One more separated link</a></li>
41 </ul>
42 </li>
43 </ul>
44 <ul class="nav navbar-nav navbar-right">
45   <li><a href="index.jsp"><i class="fa fa-arrow-circle-left fa-2x"></i></a></li>
46   <li onclick="save()"><a href="#"><i class="fa fa-floppy-o fa-2x"></i></a></li>
47 </ul>
48 </div><!--/.nav-collapse -->
49 </div><!--/.container-fluid -->
50 </nav>
51
52 <!-- Main component for a primary marketing message or call to action -->
53 <div class="jumbotron">
54   <center></center>
55   <br />
56   <center><table style="border:0;">
57     <tbody>
58       <tr>
59         <td style="width:150px;"><i class="fa fa-bicycle fa-3x"></i></td><td style="width:150px;"><i class="fa fa
60       </tr>
61     </tbody>
62   </table>
63   </center>
64 </div>
65
66 </div> <!-- /container -->
67
68
69 <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
70 <script src="js/bootstrap.min.js"></script>
71 <script>
72   function save(){
73     alert("Map will be saved in the Past Trips");
74   }
75 </script>
76 </body>
77 <html>

```

Figure 16: Map/Navigation Screen JSP Implementation



With our Web prototype, we explained our travel application in detail and interviewed 3 people different from the previous interviewees. Thanks to their valuable time and patience having listened to our idea and gave positive feedback on both the idea and the design. Here is the brief summary of their feedback.

- ✚ Looks like a good idea that can make the life of a traveler more comfortable.
- ✚ Good UI and the idea is worth for designing.
- ✚ It would be better to provide with a GPS location tracer option like in Google maps.
- ✚ It would be better to include a time input (available time for trip) from the user, compare it with the average amount of time required to cover all the places and alert the user regarding the result before starting to trace the optimum path (if amount to cover is very large than the available amount of time).
- ✚ It is better if there is an option to upload our profile picture
- ✚ It would be good to add a transparent and pictorial background to all the screens.

Conclusion

As part of this assignment, we learned about the different tools and techniques to present and prototype our idea and get a general feedback before jumping into the actual implementation. After a good rounds of discussion with our travel-lovers, we refined and fine-tuned our design. We shall incorporate all the feedback given in our functional native application and try to provide a richer user experience yet simple-to-use application.