



THE UNIVERSITY OF  
**SYDNEY**

**School of Information Technologies**  
Faculty of Engineering & IT

**ASSIGNMENT/PROJECT COVERSHEET - GROUP ASSESSMENT**

Unit of Study: COMP5216 Mobile Computing

Assignment name: APP Project: Never Late

Tutorial time: 7-8pm, Monday Tutor name: Jaybie De Guzman

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# Introduction

## What the problem will solved?

(ABC News, 2016) ABC News reported that the average time for an Australian spend on the way to work every day is more than ninety minutes in 2016. The reasons lead to this serious situation are not only because of the bad traffic condition, but also because not everyone can plan for a perfect journey to work with the most time utilization efficiency everyday. Make a different on the traffic condition in Australia is difficult and has a long way to go, however, have a more reasonable plan for everyday will solve the problem easier and quicker. This Android software application will help users arrive at their destination on time and focus on the customer go to work by car. In this project, "on time" means under the premise of avoiding being late, also prevent arrived untimely. This application help users to plan for their journey to office by car reasonable and reliable with a scientific big-data analysis basis by Google Map APIs and the algorithms in this application. This application will solve the problem that people cannot arrived at work on time, increase the time availability and update the journey real-time.

The current software didn't integrate the alarm and Google Map API. In addition, this application include the algorithms to give customer preparation time. Compare with the current applications in the market, it is more customized, personalized and creativity.

## Why the problem important?

With the development of the society, working pressure is increased dramatically for everyone. People need more time to rest and sleep. Great majority of office worker have their own plan that depart to work at a specific time every day and seldom changed. However, because the traffic condition changed every day, being late or untimely for work happens often and unavoidable. Since more people trying to avoid being late, this lead to arrive untimely became the universal phenomenon but waste people's time at the same time. This situation decrease the time availability for everyone. (Forest, 2017) Forest summarized that getting to the office untimely will decrease the efficiency during the work and have a negative influence on both people's health and their career development. It is hard to control the efficiency of time availability every day for everyone, after accumulate over a long period, a big amount of time will be wasted. Time is crucially important for everyone because it is priceless and non-renewable. This application will help user plan their journey to work every day with the most efficiency of the time utilization.

On the other hand, there is no alarm-related software in the current market supply personalized service. With the big-data and artificial intelligence technologies in Google Map APIs, in addition, with the algorithms created by this project, users will have a personalized

journey plan based on the traffic condition and their life habits. At the same time, this project will decrease the mental stress for people of being late, allow them focus on the preparation step of go to work, and increase the efficiency indirectly.

## Application

### Never Late: App solution and Function Implementation

Never Late will help to solve the "On Time" problems. Based on users' departure location and destination, users will be given a best routes recommended by Never Late and after the users set up the arrival time.

### User Validation & Authentication

Related data generated, such as arrived location and estimated time, might be involved in privacy issues. To provide our customer better information security, customer will be required to validate and authenticate their identity to access the clock function of Never Late App. The following paragraphs will introduce the technical aspects of Never Late's user validation & authentication service, which include **Registration, Login and Reset Password** based on security questions.

### Registration

When firstly use Never Late, users will need to register an account to access the main functions by clicking 'Not Registered? Sign up here!' button in MainActivity.class

A new intent (RegisterActivity.class) will be showed to ask user to fill in the registration form, which include username, password, user's Email and 3 answers to the predefined security questions for the purpose of resetting passwords safely.

During this process, user could choose to quit (or back to MainActivity) by clicking the 'Cancel' button, which will pop up an alert dialog to ask user to confirm the exit process. If not, users will fill in all fields in registration form and click 'submit' button, which leads to information validation process.

By default, user will be required to fill in all fields, provide a valid email and set a password with at least 8 characters. Once form submitted, Never Late will validate these user inputs by applying string length check, username database check (check whether username exists in database) and email validator package. If some inputs are not qualified, Never Late will mark unqualified fields red and send warning message to remind user to re-input these inputs again.

Else, or if all user information has qualified, Never Late will package user information as a special user information format (refer to UserInformationFormat.class) and then store this information into local database based on Android Room Structure, which consists of multiple classes. Simultaneously, Never Late will send the message "You have successfully registered" and lead user back to MainActivity page.

Class	Function
UserInformationDao.class	Consists of methods to access / insert /delete user information
UserInformationDB.class	Initialize User Information Database Settings & Connection to Database Data
UserInformationItem.class	Build up Database entities / Tables & Allow app to get / set predefined field value

Table 1: Never Late Data Structure Component

### Login

Once user has registered, user will need to input their username and password in the login page. Once the user finish 'Input' and click submit function, Never Late then will then match the input to the record in local database. If matched, user will successfully login to the account and transfer to MapsActivity.class to set up the alarm. Otherwise, user will receive message "Your username and password are incorrect", and give remainder to re-enter the information again.

### Reset Password Based On Security Question

When registered users want to use Never Late again, they might forget their password and can't access to their alarm service. Therefore, Never Late provide a mechanism for users to reset their password by answering the security question. To reset it, users could click the 'Forgot the Password?' button to transfer the user to ChangePasswordActivity.java, which requires user to validate their identity.

User could choose whether they could cancel this process. If 'cancel' button has been clicked, it will pop up an alert dialog to ask user to confirm the exit process. If not, user will be required to input his username and answer for 3 security questions. Once submitted, Never Late will check the correctness of these and send warning message to user if these messages are not validate. Otherwise, user will be directed to ResetPasswordActivity.java and reset their password with more than 8 characters. If new password accepted, user's new password will be saved to local database by using setter method of Never Late's local database, send a successful message to user and back to login page (MainActivity), otherwise users will receive a warning message to ask users to re-enter the message.

If the users is the first time to use Never Late, they can click on the "Sign Up Here!" to access the sign up page. The "Sign Up" page will have the following pa

### Obtain location and route information

The application allows users to input their outsets and destinations for the travels. These are used as input parameters to call the google cloud platform APIs in order to obtain durations, distances and directions to optimize the final alarm functionality. The following paragraphs will introduce solutions

and implementation about 5 parts related to this process, including Maps activity, Url activity, Parsing data activity and Asynchronous activity.

#### Maps activity

This part mainly focuses on displaying the map by using google maps API and obtaining current location, outset location and destination location by method provided by this API. For implementation, to begin with, we need to use `GoogleMap` class to define an object for displaying the map and `FusedLocationProviderClient` class to define an object for handling things about location. Secondly, we need to design several methods to implement concrete function in the `onMapReady` method. A `getLocationPermission` method for checking the permission of using location service. A `updateLocationUI` method for setting the UI for the map including button for getting current location, zoom control button and map toolbar. Lastly, we create the map long click listener for further manipulation. When the user long click the map, we obtain the location of the point or clear the map according the times of clicking.

#### Url activity

This part is designed for creating the Url request for google directions API to get the API response.

For implementation, we create the `getDirectionsUrl` method to create a detailed Url with the Url entry, location of outset and destination and our API key as parameters. Then, we just use `HttpURLConnection` object to connect to the API by using the Url created before. Using `InputStream` object to get the whole stream that is sent back by the API. Finally, Using `BufferedReader` and `StringBuffer` to read the data line by line and return it.

#### Parsing data activity

This part in charge of parsing the JSON sent back by Google Directions API according to the format this API. A simplified format is shown in the figure 1.

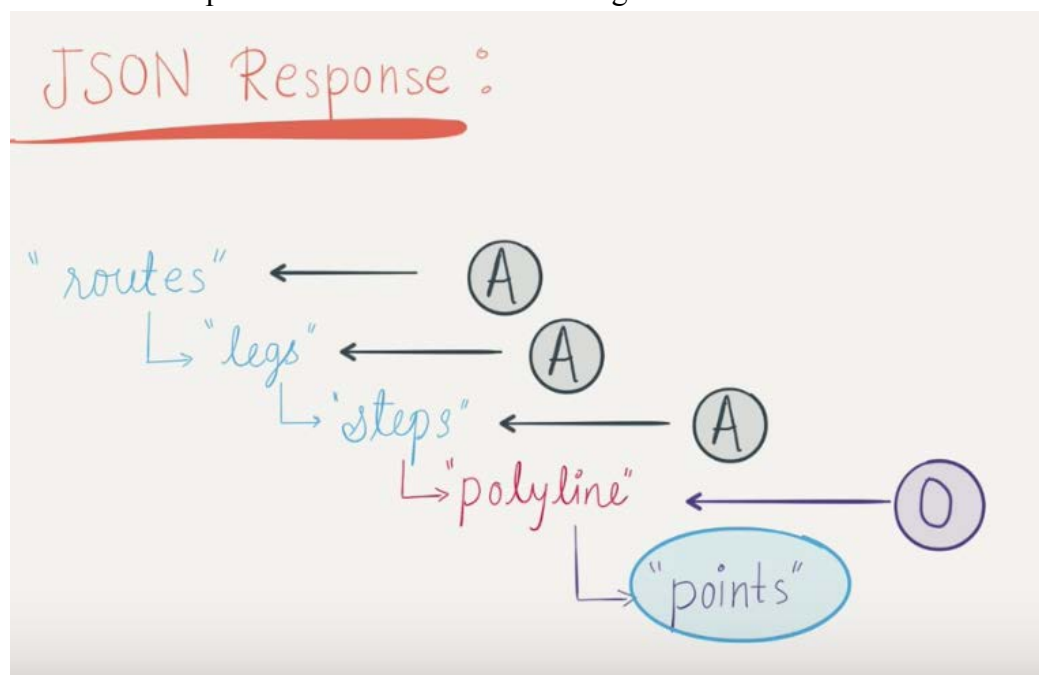


Figure 1 JSON response format

For implementation, we use **JSONObject** and **JSONArray** object to parse the JSON data. The **parseDirections** and **getDuration** method are created to obtain the duration and distance. The **parseRoute**, **getPaths** and **getPath** method are created to obtain the polyline points used to draw the directions on the map.

#### Asynchronous activity

This activity is an asynchronous activity to call the Url activity and parsing data activity for the maps activity.

For implementation, we create the **GetDirectionsData** class which extends the **AsyncTask** class. In the **doInBackground** method, we call the Url activity. In the **onPostExecute** method, we parse the JSON data and get duration, distance and polyline points. We also draw the polyline on the map in this activity.

#### Set Time

User will set time twice to in one alarm setting process. The first one is to set your preparation time, it means the time from getting up to depart for work, everyone can choose different preparation time depend on your daily behaviour. The second time for setting time is to set the time for start working, this application will calculate the time to get up from bed and maximum the time utilization.

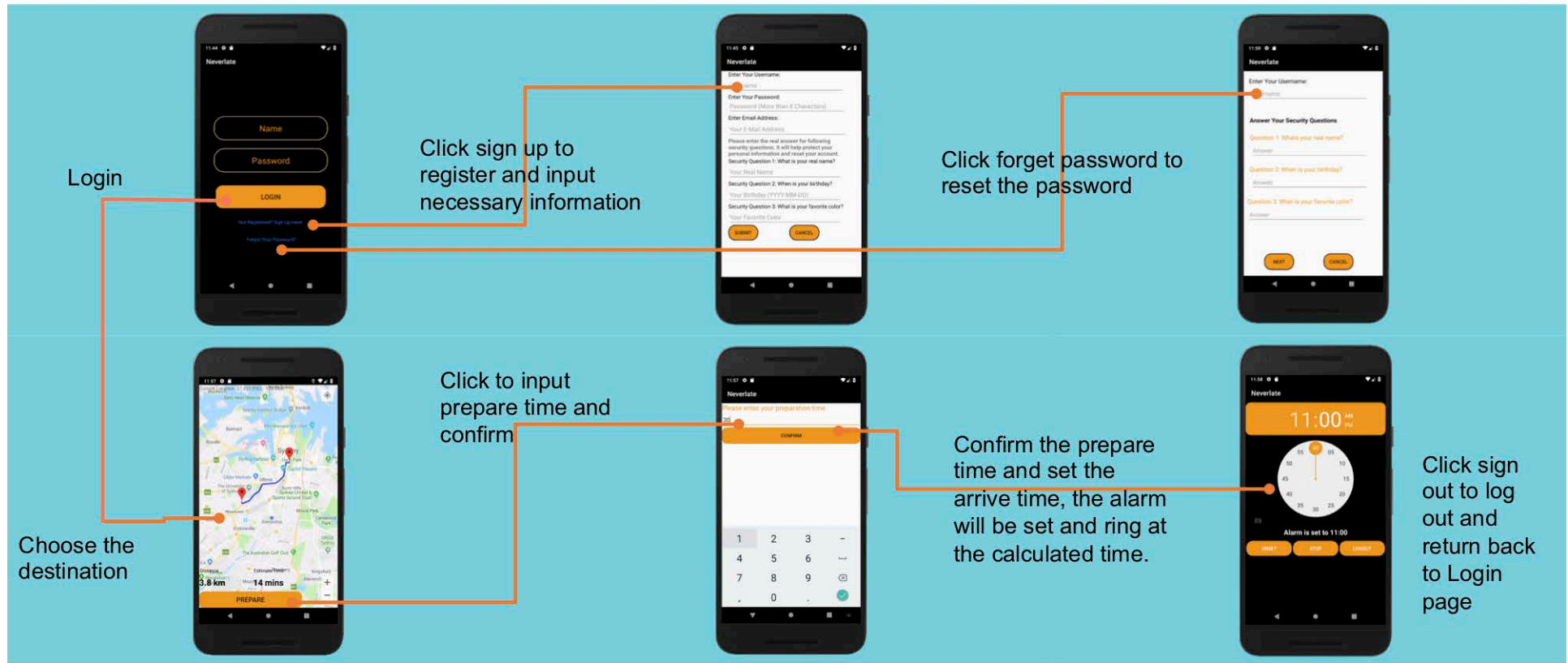
Program logic: after the **MapsActivity.class** using Google API calculate the duration of the journey, this application will send the duration to **PrepareActivity.class**, in this class, the algorithm will processing the data and convert the duration into minutes. In the **PrepareActivity.class**, it will allow user input their preparation time in minutes, package these two time result and send to **ClockActivity.class**.

#### Alarm

The alarm will enable users to modify their own arrive alarm and also allow the users to sign out. The alarm will ring based on the time the algorithm calculated for. And user can stop the alarm when he or she get up, start your everyday routine and you will start working on time everyday.

Program logic: when **ClockActivity.class** received the time from **PrepareActivity.class**, the user can set their start working time in the time picker. When user finished setting the start working time, the data will send to **alarmreceiver.class**, and the **alarmreceiver.class** send the condition to trig the alarm by send the trigger condition to **RingtonePlayingService.class**. **RingtonePlayingService.class** will play the music when received the instruction from **alarmreceiver.class**. And a button to stop the music is in the **ClockActivity.class**.

# Storyboard





# Storyboard

When a user open Never Late, he/she will see the login page and he/she will click on the sign up to redirect to the register page.

User will type in the username, password and e-mail address. Then the user will answer three security questions. When user click on the submit button, user will go back to the login page and typed in the name and password. After click the login page, the user will be redirected to the map page.

If the user forget the password, he/she can click the forget password and go to the reset password page. The user can type in the user name and answer the security questions to verify the information and reset the password

User can choose the departure location and long click on the map, then choose the destination location and also long click on the map, then the recommend routes will showed on the map. What is more, the distance and estimate time will also be displayed on the screen.

Then user can click on the prepare button and will be redirected to prepare time page. User can type in the estimate prepare time for departure and click on confirm button to confirm the prepare time.

Then the user will be redirected to the alarm setting page. User can set the ideal arrive time via the alarm clock and click the set button. The alarm will be set and showed on the screen. The user can also unset the alarm or stop the alarm when it ringing.

User can click on the logout button to sign out and go back to the login page.

# Reflection on preparing the presentation

In the period of preparing of this presentation, we have learnt some vital factors to improve presentation (Larry, 2018). First of all, practice makes perfect, we are supposed to practice our speech draft many times in order to speak fluently, Secondly, it is better to prepare our material well including slides, videos, pictures and any other things related to entertaining the audiences. These visual aids should be easy to read and suitable at the same time. Then, we need to show our confidence by speaking directly to our audiences and maintaining eye contact with them instead of just looking the slides or notes. Finally, timing is the most important things of giving a speech, we should finish on time and divide time to every member appropriately.

## References

ABC News. (2018). Fact check: Do nine in 10 Australians spend more than 90 minutes a day commuting?. [online] Available at: <http://www.abc.net.au/news/2015-07-09/commuting-times-travel-shorten/6592510>

Forset, A. (2017). 4 Reasons Getting to the Office Early Holds Me Back in My Career. [online] Themuse.com. Available at: <https://www.themuse.com/advice/4-reasons-getting-to-the-office-early-holds-me-back-in-my-career>

20 Ways to Improve Your Presentation Skills. (2018). Retrieved from <https://www.wordstream.com/blog/ws/2014/11/19/how-to-improve-presentation-skills>