

## 1.0 Introduction

This main purpose of this project is calculating the surface area of the road in designated area. Unit testing report can categorize into three main area which is Application, Socket-Server and functions in the server side. Application is to start a local server and the client can connect to the local server through a specific port. Socket-Server is the testing whether the server and client side are communicating in real-time and able to pass data to each other. Furthermore, there are functions such as downloadimage, calculatepixel and calculatearea. All these testing areas need to pass for the program to run. Mocha & Chai are used for Unit Testing. Mocha is a Javascript test framework and Chai is an assertion library. As for System Testing, Acceptance testing is used to evaluate the project requirements and acceptable for delivery.

## 2.0 Test Report

### 2.1 Unit Testing

The main purpose of unit testing is to test every function individually. Mocha & Chai are used in this testing. There is 'test.js' in the folder to test the program with Mocha & Chai. In order to run the test script, follow these few steps: -

1. Open command prompt
2. Go to the file directory
3. Type 'npm run test'
4. It will display the result of the test as following

**Requirement** - Ensure the required dependencies are installed in the device and the list of dependencies can be found in Final Report of this project

```
C:\Users\ASUS\Desktop\FIT3036>npm run test

> fit3036@1.0.0 test C:\Users\ASUS\Desktop\FIT3036
> mocha || true

Final Year Project is listening on port 3000!
App
  ✓ App should respond to GET html.

Socket-Server
  Socket is connected !
  ✓ User able to connect to the server.
  Socket is connected !
  Server received the static map URL from client side !
  ✓ User can communicate to the server in real time

App function
  ✓ Server able to get URL & download static map image - downloadimage(url,latitude,mapzoom)
  ✓ Server able to calculate the pixel based on the static image - calculatepixel()
  ✓ Server able to calculate the surface area of the road in the static image - calculatearea(counter)

6 passing (99ms)
```

There are three main areas and six main testing in this unit testing as shown below in the table.

Test	Description	Actions/Input	Expected Result	Actual Result
1.0 Application				
1.1 GET HTML	App should respond to GET html	Run in command prompt 'node app.js' to run the program	The program can run in local server	Pass
2.0 Socket-Server				
2.1 Connect to server	User able to connect to the server	Go to the port 'http://localhost:3000/'	User able to connect to the server	Pass
2.2 Communication	User can communicate to the server in real time	Draw rectangle on Google Map and server should be able to receive it in real time	User can communicate to the server in real time	Pass
3.0 App function				
3.1 Download image	Server able to get URL & download static map image	Server download the static map image and store it in local storage	Image is downloaded in local storage	Pass
3.2 Calculate pixel	Server able to calculate the pixel based on the static image	Server reads the static image in local storage and calculate the pixels	Able to get the specific pixels in the static image	Pass
3.3 Calculate area	Server able to calculate the surface area of the road in the static image	Server takes the counter value and calculate the surface area with formulas	Able to calculate the surface area based on the pixels	Pass

## 2.2 System Testing

User acceptance testing is used for testing the whole system. This testing makes sure that the system can handle real-world scenarios, according to specifications and requirements. The table below are the test cases that are identified in this project and whether they pass or fail the criteria.

ID	Test Cases	Pass/Fail	Tested by	Date Tested
1	User can connect to the server with a local port	Pass	XI YU LIEW	23/05/2018
2	User able navigate to 'About' page	Pass	XI YU LIEW	23/05/2018
3	User able to draw rectangle in Google Map	Pass	XI YU LIEW	23/05/2018
4	User able to click the 'Calculate' button and result are displayed	Pass	XI YU LIEW	23/05/2018
5	Program able to generate correct static map URL based on the designated area	Pass	XI YU LIEW	23/05/2018
6	Program able to communicate with the server side	Pass	XI YU LIEW	23/05/2018
7	Program able to send the static map URL	Pass	XI YU LIEW	23/05/2018
8	Server received the correct static map URL	Pass	XI YU LIEW	23/05/2018
9	Server able to download image from the URL	Pass	XI YU LIEW	23/05/2018
10	Server able to access the downloaded image	Pass	XI YU LIEW	23/05/2018
11	Server able to access the pixel of the image	Pass	XI YU LIEW	23/05/2018
12	Server able to get the RGB value from the pixel	Pass	XI YU LIEW	23/05/2018
13	Server able to count specific RGB value pixels	Pass	XI YU LIEW	23/05/2018
14	Server able to calculate the total surface area of the static image	Pass	XI YU LIEW	23/05/2018
15	Server able to return the value to client side	Pass	XI YU LIEW	23/05/2018
16	Program able to display the value in the server side	Pass	XI YU LIEW	23/05/2018
17	Correct surface area value in "m <sup>2</sup> " is shown in the client side	Pass	XI YU LIEW	23/05/2018
18	Correct surface area value in "km <sup>2</sup> " is shown in the client side	Pass	XI YU LIEW	23/05/2018

### 3.0 Conclusion

In conclusion, test report is important to determine whether the project has achieved the functional requirements. After performing unit testing and system testing, this project passed all the test case that had been identified. This shows that the system could run smoothly and fulfill the functional requirements of the project.