Software Development

SAT

Testing

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# Testing table

Login page

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Log in (success) | ID: 112233  PW: test | Login success.  User taken to home page | As expected |  |
| Log in (wrong password) | ID: 112233  PW: test1 | Login error.  Error message: “incorrect license number or password”.  Form resets. | As expected |  |
| Log in (wrong license number) | ID: 112234  PW: test | Login error.  Error message: “incorrect license number or password”.  Form resets. | As expected |  |
| Error modal | Incorrect login details | Error modal appears. Dismisses on close button click. | As expected |  |
| Validation | Letters and special characters into license number field. | Letters and special characters cannot be inputted. | Letter “e” can be inputted. | Added: onkeydown= "javascript: return event.keyCode == 69 ? false : true"  to input field. This was also added to the license field in the supervising drivers forms. |

Header bar

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Title | Visit different pages | Header bar shows the correct page title | As expected |  |
| Logout button | Visit different pages | Logout button displays on all pages except “Log in”, “Register” and “Trip in progress” | As expected |  |

Navigation bar

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Display | Visit different pages | Navigation bar does not appear on login, register, or trip in progress pages. | As expected |  |
| Links | Links clicked | Links take the user to the correct pages. | As expected |  |
| Active element | Visit different pages | Correct section of the nav is coloured darker. | As expected |  |
| Icons | Viewed | Icons appear correctly | As expected |  |

Logout functionality

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Log out (clear variables) | In logged in state. Confirm logout. Print ID session var. | Unidentified variable. | As expected |  |
| Redirect | Confirm logout | User taken to login page | As expected |  |
| Logout modal | Logout button clicked | Logout modal appears. Dismisses on close button click. | As expected |  |

ID check

This piece of code was included on every page except the login and register page. This code checked that the session variable *user\_id* was set, therefore checking if the user was logged in. If not, the user would be redirected to the login page.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| ID check | Each page url visited when not logged in. | Taken to login page | As expected |  |

Register functionality

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Store details | First: John  Last: Smith  License: 321321  Password: password1@ | Successful registration. Details stored correctly. | As expected |  |
| License number taken | First: Bob  Last: Jones  License: 321321  Password: Bob1 | Error modal saying license number already taken.  Details not stored. Registration form reset. | As expected |  |
| License number taken modal | License: 321321 | Modal closes on dismiss button click. | As expected |  |
| Success modal | Successful registration | Modal appears. On ‘continue’ button click, user is logged in and taken to home page. | If users click the default ‘X’ button to dismiss the modal, they remain on the register page. | Close button removed from modal. |
| Back button | Button clicked | User taken to login page | As expected |  |

Home page

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| User’s name | Logged in to an account | The user’s name is correctly displayed at the top of the page. | As expected |  |
| Total duration | Duration:  0 mins | Total duration:  00hrs 00mins | As expected |  |
| Total duration | Duration:  59 mins | Total duration:  00hrs 59mins | As expected |  |
| Total duration | Duration:  60 mins | Total duration:  01hrs 00mins | As expected |  |
| Total duration | Duration:  1,567 mins | Total duration:  26hrs 07mins | As expected |  |
| No supervising drivers | View home page with a user who has not created any supervising drivers. | Begin trip button is disabled. Warning message appears, telling users to create a supervising driver. | As expected |  |

Supervising drivers page

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Display supervising drivers | Driver 1:  Name: Joe Smith  Phone: 123123  License: 700700  Driver 2:  Name: Bob Smith  Phone: 9000999  License: 400400 | Table displays supervising drivers’ details correctly, and in the correct places. Only drivers associated with the user are displayed. | As expected |  |
| Table with no supervising drivers | No supervising drivers associated to user | Page shows empty table. | As expected |  |
| + new driver button | Button clicked | User is taken to the page to create a new supervising driver | As expected |  |
| Edit driver link | Link clicked | User is taken to the edit drivers page, the corresponding driver id is included in the address bar. | As expected |  |

New supervising driver page

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Store details | First: Driver  Last: Dan  License: 67896789  Phone: 500400 | Details stored correctly. | As expected |  |
| Form validation (type) | Letters and special characters typed into license number field | Letters and special characters cannot be typed into license number field | As expected |  |
| Form validation  (existence) | Form submitted with missing data | Form cannot be submitted with missing fields | As expected |  |
| Submit button | Button clicked | Form submitted. User taken to view drivers page. | As expected |  |
| Back button | Button clicked | User taken to view drivers page | As expected |  |

Edit supervising driver page

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Fill form | ID=10 | Form is filled with details:  First: Driver  Last: Dan  License: 67896789  Phone: 500400 | As expected |  |
| Form validation (type) | Letters and special characters typed into license number field | Letters and special characters cannot be typed into license number field | As expected |  |
| Form validation  (existence) | Form submitted with missing data | Form cannot be submitted with missing fields | As expected |  |
| Submit button | Button clicked | Form submitted. User taken to view drivers page. | As expected |  |
| Update details: | First: Super  Last: Danny  License: 67890000  Phone: 55443322 | Details stored correctly | As expected |  |
| No ID situation | Page reached with no ID in address bar | User taken to view drivers page | As expected |  |
| Back button | Button clicked | User taken to view drivers page | As expected |  |

Progress page

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Total duration | Duration:  0 mins | Total duration:  0hrs 0mins | As expected |  |
| Total duration | Duration:  59 mins | Total duration:  0hrs 59mins | As expected |  |
| Total duration | Duration:  60 mins | Total duration:  1hrs 0mins | As expected |  |
| Night hours | Night duration:  0 mins | Night hours:  0hrs 0mins | As expected |  |
| Night hours | Night duration:  59 mins | Night duration:  0hrs 59mins | As expected |  |
| Night hours | Night duration:  60 mins | Night duration: 1hrs 0mins | As expected |  |
| Month | None | Current month (August) | As expected |  |
| Monthly progress  (percentage) | 0 mins for the month | 0% | As expected |  |
| Monthly progress (percentage) | 60 mins for the month | 20% | As expected |  |
| Monthly progress (percentage) | 299 mins for the month | 99% (100% should only display when user has reached 300 mins) | 100% | Changed:  $month\_duration / 300  To:  floor(($month\_duration / 300)\*100)/100 |
| Monthly progress (percentage) | 299 mins for the month | 99% | As expected |  |
| Monthly progress (percentage) | 300 mins for the month | 100% | As expected |  |
| Monthly progress (percentage) | 301 mins for the month | 100% | As expected |  |
| Monthly progress (percentage) | 400 mins for the month | 100% | As expected |  |
| Monthly progress (time remaining) | 0 mins for the month | 5hrs 0mins remaining | As expected |  |
| Monthly progress (time remaining) | 59 mins for the month | 4hrs 1mins remaining | As expected |  |
| Monthly progress (time remaining) | 60 mins for the month | 4hrs 0 mins remaining | As expected |  |
| Monthly progress (time remaining) | 299 mins for the month | 0hrs 1mins remaining | As expected |  |
| Monthly progress (time remaining) | 300 mins for the month | You have reached the 5 hour goal for this month | As expected |  |
| Monthly progress (time remaining) | 301 mins for the month | You have reached the 5 hour goal for this month | As expected |  |

Trip in progress functionality

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item tested** | **Inputs** | **Expected outputs** | **Actual outputs** | **Changes** |
| Begin trip modal | Begin trip button clicked | Modal appears. Closes on close/cancel button click. On begin button click, user is taken to the in\_progress page | As expected |  |
| Initial odometer modal | Page load | Modal appears, can only be closed by submitting the form. | Modal can be closed by clicking outside the modal area or pressing ESC. | data-backdrop="static" data-keyboard="false" added to modals.  This was also added to other modals that should not be dismissed without completing an action within the modal. |
| Initial odometer form | begin\_odo = 54321 | begin\_odo = 54321 in address bar | As expected |  |
| Page validation | No select inputs selected | End trip button disabled | As expected |  |
| Page validation | One input selected. | End trip button disabled | As expected |  |
| Page validation | Two input selected. | End trip button disabled | As expected |  |
| Page validation | Three input selected. | End trip button disabled | As expected |  |
| Page validation | All inputs selected | End trip button becomes enabled | As expected |  |
| Supervising driver drop down box | Logged into account with supervising drivers | All supervising drivers associated with the user appear in the drop down box | As expected |  |
| Parking checkbox | Checked | parking=1 in address bar | As expected |  |
| Parking checkbox | Not checked | parking=0 in address bar | As expected |  |
| Form submission | Time of day: Day  Traffic: Light  Road type: Local streets  Supervising Driver: 9  Parking: on  Weather: Dry | Correct details submitted in address bar | As expected |  |
| Form submission | Time of day: Night  Traffic: Heavy  Road type: Freeway  Supervising Driver: 9  Parking: off  Weather: Wet | Correct details submitted in address bar | As expected |  |
| Details stored to database | As above | All details correctly stored to the database | As expected |  |
| End trip modal | End trip button clicked | Modal appears. Dismissed on cancel/close button click. On Confirm button click, final odometer modal appears. | As expected |  |
| Final odometer modal | Confirm end trip button clicked | Modal appears. Cannot be dismissed until form submitted. | As expected |  |
| Final odometer modal validation | end\_odo = 54320 | Input rejected. User cannot enter number less than the initial odometer reading. | As expected |  |
| Distance calculation | begin\_odo = 54321  end\_odo = 54329 | Distance = 8 | As expected |  |
| Time | Trip duration: 45secs | Trip duration:  7mins 30secs  (10x speed)  Rounds to 8mins | As expected |  |
| Time | Trip duration: 120secs | Trip duration:  20mins 00secs | As expected |  |
| Stopwatch | Timer was run (at regular speed) alongside a stopwatch | After 4 minutes, the program’s timer is within 1 second of real time.\* | Program was slightly more than 1 second slow. | SetTimeout interval changed from 996 to 993 |
| Stopwatch | Timer was run (at regular speed) alongside a stopwatch | After 4 minutes, the program’s timer is within 1 second of real time.\* | As expected |  |
| 2 hours limit | Timer reached 2 hours | Timer stops. Modal appears and dismisses on close button click. | As expected |  |
| 2 hours limit | Duration lasted longer than 120 minutes | Duration gets stored as 120 minutes. | As expected |  |

\*this means that after 2 hours, the time difference will be no greater than 30 seconds, which will have no effect due to the rounding to the nearest minute.

# Useability test plan

**What will be tested:**

The useability tests will measure a user’s ability to:

* Register a new account
* Log in to an existing account
* Switch accounts (incl. logging out)
* Add a supervising driver
* Edit a supervising driver
* Record a trip in various scenarios

**Test requirements:**

The tests will take place in a one on one situation, wherein the test user is given the solution and asked to complete the aforementioned tasks. The assessor will take notes on how the users perform, placing emphasis on any mistakes or misunderstandings of the participants. The results of this test will then be used to create a list of issues or areas of improvement that may then be altered prior to final submission.

**Test participants:**

The tests will be undertaken by at least two potential users (learner drivers), and at least one supervising driver, as they may be using the solution while the learner driver is preparing to begin a trip.

**Test metrics:**

The test results will be based upon each user’s:

*in order of importance (most to least)*

* Success when completing tasks
* Need for assistance
* Speed when completing tasks

If at any time, a participant cannot complete a task or requires assistance, a note will be made and highly prioritised. After the test, it will be reviewed and any necessary changes will be made to the solution.

The following are the suggested time allocations to the completion of each task. If a test participant surpasses this time when undertaking a task, it will be noted and later reviewed to determine what caused it.

|  |  |
| --- | --- |
| **Task** | **Suggested time (sec)** |
| Register a new account | 45 |
| Log in to an existing account | 15 |
| Switch accounts | 20 |
| Add a supervising driver | 45 |
| Edit a supervising driver | 20 |
| Begin a trip | 20 |
| End a trip | 30 |

**Scenarios:**

Each user will undertake each scenario and their results will be recorded. The instructions each user will receive are as follows.

|  |  |  |
| --- | --- | --- |
| **Scenario** | **What’s being tested** | **Instructions** |
| 1 | Registration | Register an account for:  Name: John Smith  License number: 90065411  Password: myPas$word99 |
| 2 | Log in to an account | Log into the account just registered.  License number: 90065411  Password: myPas$word99 |
| 3 | Switch to another account | Log out of the current account, and log into the account:  License number: 88834310  Password: steve1@77 |
| 4 | Add a supervising driver | Add a supervising driver with details:  Name: Bob Matthews  Phone: 0400123123  License number: 00215015 |
| 5 | Edit a supervising driver | Change the previously added supervising driver’s details to be:  Name: Robert Matthews  Phone: 0400123192  License number: 00215030 |
| 6 | Record a trip (a) | Record a trip where you drive for 10 minutes through local streets. It is midday, the weather is dry, the traffic is light and you did not park. Robert Matthews is supervising your trip. The odometer begins at 12654 and ends at 12660. |
| 7 | Record a trip (b) | Record a trip where you drive for 20 minutes on the freeway. It is 10pm, it has been raining, the traffic is moderate and you parked at the end of your trip. Robert is again supervising. The odometer begins at 12900 and ends at 12914. |
| 8 | Record a trip (c) | Record a trip where you drive for 15 minutes in the city. It is 3pm, the weather is dry, the traffic is heavy and you did no parking. Robert again supervises your trip. The odometer begins at 12950 and ends at 12953. |

# Useability tests

In the scenarios requiring users to log a trip, the time was only recorded for the duration to begin and end the trip.

User 1:

|  |  |  |  |
| --- | --- | --- | --- |
| **Item tested** | **Success?** | **Time (sec)** | **Comments** |
| Registration | Yes | 35 |  |
| Log in to an account | Yes | 15 |  |
| Switch to another account | Yes | 20 |  |
| Add a supervising driver | Yes | 35 |  |
| Edit a supervising driver | Yes | 15 |  |
| Record a trip (a) | Yes | 50 | Times for the trips would be significantly shorter, the user took some time referring to the instructions to get the trip details correct. \* |
| Record a trip (b) | Yes | 45 |  |
| Record a trip (c) | Yes | 35 |  |

\*This was the same for all users in all trip scenarios.

User 2:

|  |  |  |  |
| --- | --- | --- | --- |
| **Item tested** | **Success?** | **Time (sec)** | **Comments** |
| Registration | Yes | 42 |  |
| Log in to an account | Yes | 13 |  |
| Switch to another account | Yes | 22 |  |
| Add a supervising driver | Yes | 40 |  |
| Edit a supervising driver | Yes | 17 |  |
| Record a trip (a) | Yes | 46 |  |
| Record a trip (b) | Yes | 41 |  |
| Record a trip (c) | Yes | 39 |  |

User 3:

|  |  |  |  |
| --- | --- | --- | --- |
| **Item tested** | **Success?** | **Time (sec)** | **Comments** |
| Registration | Yes | 40 |  |
| Log in to an account | Yes | 14 |  |
| Switch to another account | Yes | 20 |  |
| Add a supervising driver | Yes | 30 |  |
| Edit a supervising driver | Yes | 20 | This took longer because the user took time to check the instructions and ensure they were entering the correct information |
| Record a trip (a) | Yes | 49 |  |
| Record a trip (b) | Yes | 47 |  |
| Record a trip (c) | Yes | 40 |  |

To make development and testing much easier and quicker, the solution was programmed to run at 10x speed. This meant that to log a 20 minute trip, the solution would only have to run for 2 minutes.

This resulted in a few errors when participants were asked to log a trip for a particular duration. For example, if a user was asked to log a 15 minute trip, they would wait until the timer reached 15 minutes before they began the process of ending a trip. Because the program is running at 10x speed, if the user took 20 seconds to end the trip, this would actually add 200 seconds (3 minutes) to the trip duration, therefore making the trip duration actually 18 minutes instead of 15.

These errors were disregarded, because if the solution was properly implemented and the time was running regularly, adding 20 seconds to the end of the trip would not influence the total duration, unless the added time caused the user to pass over the half-way point of a minute, therefore their time (in minutes) would be rounded up, not down. Ultimately, occasionally adding an extra minute to a trip duration was considered a negligible difference to effectiveness of the solution.

# Useability report

In the useability tests that were conducted, no users were incapable of completing a task, nor did they require any assistance when doing so. This shows that the solution is easy to use and appropriately validated with enough instructions for users to know how to complete each task.

Most of the tasks were completed within the suggested time, however, a few instances occurred where the user took slightly longer. These longer durations were largely due to the time the users spent reading the data on the instructions to ensure they inputted the correct details. In these cases, the timing was disregarded as in a real-world situation, the user would already know the details that need to be inputted and therefore will not spend a long time inputting the data.

Another point to note is that with each situation, the users logged a trip faster than their previous time. This shows there is a slight learning curve to logging process, however this would be easily overcome once a user has recorded a few trips.