Software Testing Report

NSW Traffic Penalty Tool

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# Unit Tests

Software testing is an important stage in any software project. By making software fail, bugs are easier to identify and allow failures to be fixed. In the NSW Traffic Penalty Data Tool (NTPT) project, the waterfall model has been applied. The waterfall model means that testing is performed at the end and was used as a buffer to compensate for unexpected project delay. Each component of NTPT has been tested individually, this is known as unit testing (white-box style). Table 1 displays the NTPT unit tests, allowing stakeholders to view the overall quality of the software program.

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Test Case | Expected Results | Actual Results |
| **1.0** | **Check that text file exists** | | |
| 1.1 | Test file existence | Print “data.csv exists”. | Prints “data.csv exists” on console. |
| 1.2 | Test wrong file name | Print “file not found or file name error”. Stops code and exits. | Prints “file not found or file name error”. Stops code and exits. |
| 1.2 | Check | Error message appears. | Print “file not found or file name error”. Stops code and exits. |
| 2.0 | **Check Start Month** | | |
| 2.1 | Testing that start\_month can be converted into integer. | Print “Start Month is correct type” on console. | Prints “Start Month is correct type” on console. |
| 2.2 | Put string value(‘a’) to start\_month and run. | Print “Start Month is wrong type” on console. | Prints “Start Month is wrong type” on console. |
| **3.0** | **Check Start Year** | | |
| 3.1 | Testing that start year can be converted into integer. | Print “Start year is correct type” on console. | Prints “Start year is correct type” on console. |
| 3.2 | Put string value(‘a’) to start year and run. | Print “Start year is wrong type” on console. | Prints “Start year is wrong type” on console. |
| **4.0** | **Check End Month** | | |
| 4.1 | Testing that end month can be converted into integer. | Print “end month is correct type” on console. | Prints “end month is correct type” on console. |
| 4.2 | Put string value(‘a’) to end month and run | Print “end month is wrong type” on console. | Prints “end month is wrong type” on console. |
| **5.0** | **Check End Year** | | |
| 5.1 | Testing that end year can be converted into integer. | Print “end year is correct type” on console. | Prints “end year is correct type” on console. |
| 5.2 | Put string value(‘a’) to end year and run. | Print “end year is wrong type” on console. | Prints “end year is wrong type” on console. |
| **6.0** | **Check that school\_zone\_bool is a Boolean** | | |
| 6.1 | Use isinstance function to check whether the school\_zone\_bool is a bool type. | Print “school\_zone\_bool is correct type” on console. | Prints “school\_zone\_bool is correct type” on console. |
| 6.2 | Put “True” in school\_zone\_bool. | Print “school\_zone\_bool is not correct type” on console. | Prints “school\_zone\_bool is not correct type” on console. |
| **7.0** | **Check that the range\_date\_date\_format is a date type by using isinstance** | | |
| 7.1 | Use isinstance function to check whether the range\_date\_date\_format is a bool type. | Print “range\_date\_date\_format is correct type” on console. | Prints “range\_date\_date\_format is correct type” on console. |
| 7.2 | Insert “2012-03-01” to range\_date\_date\_format. | Print “range\_date\_date\_format doesn't convert into date format” on console. | Prints “range\_date\_date\_format doesn't convert into date format” on console. |

Table - Testing

# Coverage Report (HTML)

The idea of code coverage is to create a list of tasks and check that each task is covered during the testing process. Functions, statements, branches, and conditions must be evaluated. Function coverage refers to how many functions defined in code have been called. Statement coverage refers to how many statements have been executed. Branches coverage refers to how many branches of the control structures have been executed. Condition coverage refers to how many of the Boolean sub-expressions have been tested (True or False value).

As shown in Table 2, NTPT has a test coverage of 55.4%. The higher the code coverage, the higher the defect detection. While it may be assumed that coverage should be 100%, to do so is costly and does not mean the system is defect free. Furthermore, 100% coverage may not provide much benefit, as the domain of possible inputs for a program can be too large to be used in a testing system. The coverage of NTPT is measured by the percentage of program statements executed by the test suite.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Module | Statements | Missing | Excluded | Coverage |
| draw\_graph\_all.py | 55 | 39 | 0 | 58.5% |
| oop\_main.py | 146 | 123 | 0 | 54.3% |
| Total | **201** | **162** | **36** | **55.4%** |

Table - Test Coverage

# Requirements Acceptance Testing

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Software Requirement Identifier** | **Test** | **Implemented (Full/Partial/None)** | **Test Results**  **(Pass/Fail/Not Applicable)** | **Comments (for partial or failed test result)** |
| **R1.1** | The program shall ask for input for a date range between 2011-2018, this can be anywhere from years to days |  |  |  |
| **R1.2** | The program will provide a search box where user can filter offences by type of offence or various keywords. | None | N/A |  |
| **R1.3** | The program shall provide a list of offences relevant to type/keyword. User can click on each offence to get more information. |  |  |  |
| **R1.4** | The program shall provide a chart showing the distribution of number offences in each code. |  |  |  |
| **R2.1** | Main page present calendar to select start date and end date. |  |  |  |
| **R2.2** | In main page “School Zone” check box should be able to check or uncheck the checkbox. |  |  |  |
| **R2.3** | In main page “Search” button can be clicked by user |  |  |  |
| **R2.4** | In main page, after user click “Search” button the graph or appropriate result is generated on result panel. |  |  |  |
| **R2.5** | In main page, “Reset” button can be clicked by user |  |  |  |
| **R2.6** | In main page, by clicking “Reset” button clear or reset the input data such as ‘Start date’, ‘End date’ and check box. |  |  |  |
| **R2.7** | In main page, Navigation bar present on the left side of Main page. |  |  |  |
| **R2.8** | In the main page the colour of ‘Main’ button in navigation bar changed. |  |  |  |
| **R3.1** | By pressing ‘Distribution of cases in each offence code’ button user can move to that page. |  |  |  |
| **R3.2** | By pressing ‘Radar or Camera’ on navigation bar user can move to that page. |  |  |  |
| **R3.3** | By pressing ‘Mobile Phone Usage’ on navigation bar user can move to that page. |  |  |  |
| **R3.4** | By pressing ‘School Zone’ from navigation bar user can move to that page. |  |  |  |
| **R3.5** | If user access to ‘Distribution of cases in each offence code’ page the colour of ‘Distribution of cases in each offence code’ button in navigation bar will be changed. |  |  |  |
| **R3.6** | If user access to ‘Radar or Camera’ page the colour of ‘Radar or Camera’ button in navigation bar will be changed. |  |  |  |
| **R3.7** | If user access to ‘Mobile Phone Usage’ page the colour of ‘Mobile Phone Usage’ button in navigation bar will be changed. |  |  |  |
| **R3.8** | If user access to ‘School Zone’ page the colour of ‘School Zone’ button in navigation bar will be changed. |  |  |  |
| **R4.1** | ‘Distribution of cases in each offence code’ page present calendar to select start date and end date. |  |  |  |
| **R4.2** | In ‘Distribution of cases in each offence code’ page, “School Zone” check box should be able to check or uncheck the checkbox. |  |  |  |
| **R4.3** | In ‘Distribution of cases in each offence code’ page, “Search” button can be clicked by user |  |  |  |
| **R4.4** | In ‘Distribution of cases in each offence code’ page, after user click “Search” button the graph or appropriate result is generated on result panel. |  |  |  |
| **R4.5** | In ‘Distribution of cases in each offence code’ page, “Reset” button can be clicked by user |  |  |  |
| **R4.6** | In ‘Distribution of cases in each offence code’ page, by clicking “Reset” button clear or reset the input data such as ‘Start date’, ‘End date’ and check box. |  |  |  |
| **R4.7** | In ‘Distribution of cases in each offence code’ page, navigation bar present on the left side of Main page. |  |  |  |
| **R5.1** | ‘Radar or Camera’ page present calendar to select start date and end date. |  |  |  |
| **R5.2** | In ‘Radar or Camera’ page, “School Zone” check box should be able to check or uncheck the checkbox. |  |  |  |
| **R5.3** | In ‘Radar or Camera’ page, “Search” button can be clicked by user |  |  |  |
| **R5.4** | In ‘Radar or Camera’ page, after user click “Search” button the graph or appropriate result is generated on result panel. |  |  |  |
| **R5.5** | In ‘Radar or Camera’ page, “Reset” button can be clicked by user |  |  |  |
| **R5.6** | In ‘Radar or Camera’ page, by clicking “Reset” button clear or reset the input data such as ‘Start date’, ‘End date’ and check box. |  |  |  |
| **R5.7** | In ‘Radar or Camera’ page, Navigation bar present on the left side of Main page. |  |  |  |
| **R6.1** | ‘Mobile Phone Usage’ page, present calendar to select start date and end date. |  |  |  |
| **R6.2** | In ‘Mobile Phone Usage’ page, “School Zone” check box should be able to check or uncheck the checkbox. |  |  |  |
| **R6.3** | In ‘Mobile Phone Usage’ page, “Search” button can be clicked by user |  |  |  |
| **R6.4** | In ‘Mobile Phone Usage’ page, after user click “Search” button the graph or appropriate result is generated on result panel. |  |  |  |
| **R6.5** | In ‘Mobile Phone Usage’ page, “Reset” button can be clicked by user |  |  |  |
| **R6.6** | In ‘Mobile Phone Usage’ page, by clicking “Reset” button clear or reset the input data such as ‘Start date’, ‘End date’ and check box. |  |  |  |
| **R6.7** | In ‘Mobile Phone Usage’ page, navigation bar present on the left side of Main page. |  |  |  |
| **R7.1** | ‘School Zone’ page, present calendar to select start date and end date. |  |  |  |
| **R7.2** | In School Zone’ page, “School Zone” check box should be able to check or uncheck the checkbox. |  |  |  |
| **R7.3** | In ‘School Zone’ page, “Search” button can be clicked by user |  |  |  |
| **R7.4** | In School Zone’ page, after user click “Search” button the graph or appropriate result is generated on result panel. |  |  |  |
| **R7.5** | In ‘School Zone’ page, “Reset” button can be clicked by user |  |  |  |
| **R7.6** | In ‘School Zone’ page, by clicking “Reset” button clear or reset the input data such as ‘Start date’, ‘End date’ and check box. |  |  |  |
| **R7.7** | In ‘School Zone’ page, navigation bar present on the left side of Main page. |  |  |  |