Software Testing Report

Victoria State Accident

Ben White - s2850345

Liam Preston - s5301986

Thomas Chapman - s5251549

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# Unit Tests

| **No** | **Test Case** | **Expected Results** | **Actual Results** |
| --- | --- | --- | --- |
| **1.0** | **Loading Data from Dataset (General Loading) - df = pd.read\_csv()** | | |
| 1.1 | Loaded data from a valid file path. | Data is successfully loaded into the system and functions flawlessly. | Data is successfully loaded into the system and functions flawlessly. |
| 1.2 | Loaded data from an invalid path. | A message prompts user indicating data failed to load. | An error message occurs stating incorrect file path. |
| 1.3 | Loaded all data into a table from the entire date range. | The data present is within the table |  |
| **2.0** | **Display a table showing the data from a specific date range - on\_search\_q1() / update\_grid()** | | |
| 2.1 | Load data successfully from valid file path. | Data is successfully loaded into the system and functions flawlessly. | Data is successfully loaded into the system and functions flawlessly. |
| 2.2 | Load data unsuccessfully from invalid file path. | A message prompts user indicating data failed to load. | An error message occurs stating incorrect file path. |
| 2.3 | Data from selected date period is displayed to user. | The time period selected is presented correctly in the table. |  |
| **3.0** | **Display a chart showing average number of accidents per hour - on\_search\_q2** | | |
| 3.1 | Load data successfully from valid file path. | Data is successfully loaded into the system and functions flawlessly. | Data is successfully loaded into the system and functions flawlessly. |
| 3.2 | Load data unsuccessfully from invalid file path. | A message prompts user indicating data failed to load. | An error message occurs stating incorrect file path. |
| 3.3 | Data from the selected date range displays hourly averages for number of accidents within valid date range. | The graph is correctly displayed matching users selected date period. |  |
| **4.0** | **Display table of keyword related accidents - on\_search\_q3** | | |
| 4.1 | Load data successfully from valid file path. | Data is successfully loaded into the system and functions flawlessly. | Data is successfully loaded into the system and functions flawlessly. |
| 4.2 | Load data unsuccessfully from invalid file path. | A message prompts user indicating data failed to load. | An error message occurs stating incorrect file path. |
| 4.3 | Table displays valid keyword related data from the dataset. | The correct table is present matching keyword inputted by the user |  |
| **5.0** | **Display a chart of alcohol involved in combination with collision type chart – on\_search\_q4 / generate\_graph** | | |
| 5.1 | Load data successfully from valid file path. | Data is successfully loaded into the system and functions flawlessly. | Data is successfully loaded into the system and functions flawlessly. |
| 5.2 | Load data unsuccessfully from invalid file path. | A message prompts user indicating data failed to load. | An error message occurs stating incorrect file path. |
| 5.3 | Analysis of alcohol and collision type with valid selection | The correct chart is displayed matching the checkbox of whether alcohol was involved or not. |  |
| **6.0** | **Display charts of speed related incidents – on\_search\_q5 / generate\_graph\_q5 / generate\_injury\_graph** | | |
| 6.1 | Load data successfully from valid file path. | Data is successfully loaded into the system and functions flawlessly. | Data is successfully loaded into the system and functions flawlessly. |
| 6.2 | Load data unsuccessfully from invalid file path. | A message prompts user indicating data failed to load. | An error message occurs stating incorrect file path. |
| 6.3 | Charts present information selected from the drop-down menu. | The chart displayed matches the speed inputted by the user. |  |

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| **Unit Test Code Examples** | | |
| 1.0 |  | import pytest import pandas as pd   def test\_load\_csv\_file():  file\_path = 'CrashStatisticsVictoria.csv'   # Attempt to read the CSV file  try:  df = pd.read\_csv(file\_path, parse\_dates=['ACCIDENT\_DATE'], dayfirst=True)   # Check if the DataFrame is not empty  assert not df.empty, "DataFrame is empty"   # Check if 'ACCIDENT\_DATE' column is of datetime type  assert pd.api.types.is\_datetime64\_any\_dtype(df['ACCIDENT\_DATE']), "ACCIDENT\_DATE column is not of datetime type"   except FileNotFoundError:  pytest.fail(f"File {file\_path} not found")  except pd.errors.EmptyDataError:  pytest.fail(f"File {file\_path} is empty")  except pd.errors.ParserError:  pytest.fail(f"Error occurred while parsing {file\_path}")   def test\_invalid\_file\_path():  invalid\_file\_path = 'InvalidFilePath.csv'   with pytest.raises(None):  df = pd.read\_csv(invalid\_file\_path) |

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| --- | --- | --- |
| 1.1 |  | import unittest import pandas as pd  class TestDateParsing(unittest.TestCase):   def test\_valid\_load(self):  file\_path = 'CrashStatisticsVictoria.csv'  df = pd.read\_csv(file\_path, parse\_dates=['ACCIDENT\_DATE'], dayfirst=True)  self.assertIsNotNone(df, "Data should not be None.")  self.assertIsInstance(df, pd.DataFrame, "Data should be a pandas DataFrame.")  self.assertFalse(df.empty, "DataFrame should not be empty.")  self.assertIn ('ACCIDENT\_DATE', df.columns, "ACCIDENT\_DATE column should exist.")   def test\_invalid\_load(self):  file\_path = 'invalidload.csv'  with self.assertRaises(FileNotFoundError):  df = pd.read\_csv(file\_path, parse\_dates=['ACCIDENT\_DATE'], dayfirst=True)  if \_\_name\_\_ == '\_\_main\_\_':  unittest.main() |
| 1.2 |  |  |
| 1.3 |  |  |

# Coverage Report

A description of the coverage of your unit tests, including how you evaluated coverage (function, statement, branch, condition)

# Requirements Acceptance Testing

| **Software  Requirement No** | **Test** | **Implemented (Full /Partial/ None)** | **Test Results (Pass/ Fail)** | **Comments (for partial implementation or failed test results)** |
| --- | --- | --- | --- | --- |
| 1.1 | The system shall provide a user-friendly interface for easy navigation and interaction. | Full | Pass | This software requirement function as required |
| 1.2 | The system shall enable users to select specific date ranges for data retrieval. | Full | Pass | This software requirement function as required |
| 1.3 | The system shall display accident details for user-selected periods. | Full | Pass | This software requirement function as required |
| 1.4 | The system shall produce an hourly chart showcasing the average number of accidents for chosen periods. | Full | Pass | This software requirement function as required |
| 1.5 | The system shall allow users to input keywords and filter accident types accordingly. | Full | Pass | This software requirement function as required |
| 1.6 | The system shall offer dedicated analysis tools focusing on alcohol-related accidents. | Full | Pass | This software requirement function as required |
| 1.7 | The software shall provide an "insight tool" to automatically generate notable patterns or trends from the dataset. | Full | Pass | This software requirement function as required |
| 1.8 | The system shall ensure data privacy and prevent unauthorized access. | None | Fail | The system didn’t allow for users to have data privacy or prevent unauthorised access. This would need to be implemented to meet this requirement |
| 1.9 | The system shall support data input in different formats like CSV, Excel, and JSON for flexibility in data sourcing. | Partial | Pass | The system was capable of reading CSV but wasn’t rested with other data formats. |
| 1.10 | The software shall be compatible with various operating systems (e.g., Windows, macOS) to ensure broad user accessibility. | Partial | Pass | The software worked with current Windows and Mac operating systems but wasn’t tested on a full array of operating systems. |
| 1.11 | The system shall provide error messages in case of invalid date ranges or keyword inputs. | None | Fail | No error messages are prompted when an incorrect user selection is made. |
| 1.12 | The system shall ensure that the data presented is updated and synced with the original dataset at regular intervals. | Partial | Pass | The information is retrieved every time the application is used. This means it only refreshes once the software is relaunched. |
| 1.13 | The system shall be optimized for performance to handle large datasets without lag. | Full | Pass | This software requirement function as required |