**System Test Design Specification**

1. **Purpose**

This document describes in more detail than the STD-2-2014-05-15 the process through which some of PlasmaGraph’s tests will be conducted. It discusses the features that are used to create graphs, and identifies the specific details of each operation being tested.

1. **Outline**
   1. **Test Design Specification Identifier**

TDS-02-XX 2014-05-22

* 1. **Features to be Tested**

1. Validate Data (FR-02) ***[see SRS-3-2014-05-15 section 2.2.1.2]***.

A.1 Remove invalid (X,Y) values.

A.2 Display message telling the user that the data file is invalid.

1. Choose Graph Options (FR-03) ***[see SRS-3-2014-05-15 section 2.2.1.3]***.

B.1 Choose the minimal options required for creating a graph.

B.2 Choose more than the minimal options required for creating a graph.

1. Create Graph (FR-04) ***[see SRS-3-2014-05-15 section 2.2.1.4]***.

C.1 Create a graph using two sets of values.

C.2 Create a graph with a linear interpolation using two sets of values.

C.3 Create a graph with a quadratic interpolation using two sets of values.

C.4 Create a graph with a spline interpolation using two sets of values.

C.5 Create a graph and identify its outliers.

C.6 Create a graph with any interpolation and determine its confidence level.

C.7 Create a graph with its (X,Y) values grouped using a third data set.

1. Save Graph (FR-05) ***[see SRS-3-2014-05-15 section 2.2.1.5]***.

D.1 Save a graph (in PNG format) in the user’s file system.

* 1. **Approach Refinements**
     1. **Testing Technique**

All features specified in section 2.2 of this document will be tested using the “Black Box” testing technique. This means that the testers will be oblivious of the system’s architecture and source code. The testers will interact with the system through its graphical user interface by providing inputs and examining outputs without knowing how and where the inputs are worked upon.

The black box testing technique was chosen for the following reasons:

* The testing comprises a very large segment of code.
* The testers need to be able to access all features being tested through a graphical user interface so access to the code is not required.
* The test must focus on the user’s perspective and not the developer’s. Visibly defined roles help achieve this goal.
  + 1. **Methods for Results Analysis**

The analysis for test cases derived from this specification will surround the system’s ability to produce graphs, save graphs and validate the data used to create graphs. To evaluate the success or failure of these test cases, the graph created by the system must be compared with the graph provided by the corresponding test case specification **[see section 2.5]**. In some test cases the success of the test isn’t determined exclusively by the graph produced by the system. Some test cases are considered passed based on the messages displayed by the system or the combination of graph and messages displayed by the system **[see section 2.5]**.

* + 1. **Common Test Cases Information**

All test cases derived from this specification must require that the testers repeats all test procedures using three (3) different operating systems and (3) different personal computers.

* 1. **Test Identification**

| Case Identifier | Description | Procedure |
| --- | --- | --- |
| TCS-02-01 | This case focusses on testing how the system creates the most basic type of graph and how it deals with NaN values in data files.  The data file used by the tester for this case must have one NaN value in each of its data sets.  This case covers features A.1, A.2, B.1, and C.1 as mentioned in section 2.2. | The tester must import a data file into the system and then order the system to create a graph using two (2) sets of values. One for the X axis and one for the Y axis. |
| TCS-02-02 | This case focusses on how the system creates graphs with linear interpolations and how the system determines the confidence level of a graph.  This case covers features B.1, B.2, C.1, C.2, and C.6 as mentioned in section 2.2. | The tester must import a data file into the system. Then the tester must order the system to create a graph identifying its confidence level, using a linear interpolation technique, and using two (2) sets of values. One for the X axis and one for the Y axis. |
| TCS-02-03 | This case focusses on how the system creates graphs with quadratic interpolations and how the system determines the confidence level of a graph.  This case covers features B.1, B.2, C.1, C.3, and C.6 as mentioned in section 2.2. | The tester must import a data file into the system. Then the tester must order the system to create a graph identifying its confidence level, using a quadratic interpolation technique, and using two (2) sets of values. One for the X axis and one for the Y axis. |
| TCS-02-04 | This case focusses on how the system creates graphs with spline interpolations and how the system determines the confidence level of a graph.  This case covers features B.1, B.2, C.1, C.4, and C.6 as mentioned in section 2.2. | The tester must import a data file into the system. Then the tester must order the system to create a graph identifying its confidence level, using a spline interpolation technique, and using two (2) sets of values. One for the X axis and one for the Y axis. |
| TCS-02-05 | This case focusses on how the system identifies outliers in a graph.  This case covers features B.1, B.2, C.1, and C.5 as mentioned in section 2.2. | The tester must import a data file into the system. Then the tester must order the system to create a graph using two (2) sets of values and identifying its outliers based on an arbitrary distance number provided by the tester.  Regarding the two sets of values selected. One must be assigned to the X axis and the other to the Y axis. |
| TCS-02-06 | This case focusses on how the system creates graphs with linear interpolations, how the system determines the confidence level of a graph and how the system groups pairs of (X,Y) values in a graph.  This case covers features B.1, B.2, C.1, C.2, C.6, and C.7 as mentioned in section 2.2. | The tester must import a data file into the system. Then the tester must order the system to create a graph using three (3) sets of values, a linear interpolation technique, and must identify the confidence level of the graph.  Regarding the sets of values selected. One must be assigned to the X axis, one to the Y axis, and one must be used for grouping (X,Y) pairs of values. |
| TCS-02-07 | This case focuses on how the system creates and saves graphs.  This case covers features B.1, C.1, and D.1 as mentioned in section 2.2. | The tester must import a data file into the system and then order the system to create a graph using two (2) sets of values. One for the X axis and one for the Y axis.  Finally, the tester must order the system to save that graph as an image in PNG format. |

* 1. **Features Pass/Fail Criteria**

Each feature will be considered a success if and only if it passes the following criteria for each of its cases:

* + 1. After running a case, the output provided to the tester by the system must match the expected output provided in the test case specification.
    2. No error messages are produced by the system unless the test case specification explicitly determines that an error message should be produced by the system.