CMSC 447

Team 3 (T3AM)

Software Test Description (STD)

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1 Scope

This section shall be divided into the following paragraphs.

1.1 Identification

The purpose of this document is to give a detailed description as well as an overview of how the T3AM Gerrymandering Tool application will be tested.

1.2 System overview

The "T3AM Gerrymandering Tool" is a web based application that generates a state map with Gerrymandered congressional districts based on the user's input, with the available inputs being current distribution, Republican, Democratic, or swing. Additionally, the application displays district information such as political party majorities and percentages. This software is for Costas Likakis, project sponsor.

1.3 Document overview

- Scope
  - Gives the general overview of the STD.
- Referenced Documents
  - Includes any documents referenced by the STD.
- Test Preparations
  - Describes any hardware or software preparations necessary to prepare the T3AM Gerrymandering Tool for testing.
- Test Descriptions
  - Provides descriptions for each test case used to test requirements.
- Requirements Traceability
  - Matches each requirement to its origin.
- Additional Notes
  - Contains any general information that aids in understanding this document.

2 Referenced documents

ADD DOCUMENTS IF NEEDED

3 Test preparations

3.1 Preparations for All Tests

3.1.1 Hardware preparation
a. A computer running Chrome version 80 shall be used for testing.

3.1.2 Software preparation
a. Chrome web browser shall be used for the testing period.
- When the application is executed, Chrome shall open up the application for testing.

4   Test descriptions

4.1   Operating Systems Tests

4.1.1   Windows 10 Test

4.1.1.1   Prerequisite conditions
   a. Must have a computer or Virtual Machine (VM) that runs Windows 10 and has Chrome version 80 installed on it.

4.1.1.2   Criteria for evaluating results
   a. If the application can be loaded on the Chrome web browser under the Windows 10 Operating System (OS), then this test is successful.

4.1.1.3   Test procedure
   1. Startup the computer or VM running Windows 10.
   2. Open up a new window in Chrome.
   3. Execute the T3AM Gerrymandering Tool.
   4. If the application loads up in that Chrome window, then the test is passed.

4.1.2   macOS Catalina Test

4.1.2.1   Prerequisite conditions
   a. Must have a computer or Virtual Machine (VM) that runs macOS Catalina and has Chrome version 80 installed on it.

4.1.2.2   Criteria for evaluating results
   a. If the application can be loaded on the Chrome web browser under macOS Catalina, then this test is successful.

4.1.2.3   Test procedure
   1. Startup the computer or VM running macOS Catalina.
   2. Open up a new window in Chrome.
   3. Execute the T3AM Gerrymandering Tool.
   4. If the application loads up in that Chrome window, then the test is passed.

4.1.3   Linux 5.5.7 Test

4.1.3.1   Prerequisite conditions
   a. Must have a computer or Virtual Machine (VM) that runs a version of Linux 5.5.7 and has Chrome version 80 installed on it.

4.1.2.2   Criteria for evaluating results
   a. If the application can be loaded on the Chrome web browser under macOS Catalina, then this test is successful.

4.1.2.3   Test procedure
   1. Startup the computer or VM running macOS Catalina.

2. Open up a new window in Chrome.
3. Execute the T3AM Gerrymandering Tool.
4. If the application loads up in that Chrome window, then the test is passed.

4.2 Main Functionality Tests

4.2.1 Welcome Page Load Test

4.2.1.1 Prerequisite Conditions
a. Application must currently be running while testing this case.

4.2.1.2 Expected Test Results
a. The welcome page should load the following elements onto the webpage without any conflicts.
    i. Team logo at the top of the page
    ii. Terms & Conditions text
    iii. Terms & Conditions checkbox
    iv. Captcha check
    v. Continue (to main page) button

4.2.1.3 Criteria for evaluating results
a. If all elements are in the right place, then this test is passed.

4.2.1.4 Test procedure
1. Execute the T3AM Gerrymandering Tool.
2. Check and validate that all elements of the web pages are in their own space and not colliding with one another.

4.2.2 Terms & Conditions Checkbox Test

4.2.2.1 Prerequisite Conditions
a. Application must currently be running while testing this case.
b. Must be on the welcome page of the application.

4.2.2.2 Expected Test Results
a. The Terms & Conditions checkbox on the welcome page will be checked when the user clicks on it, if previously unchecked.
b. The Terms & Conditions checkbox on the welcome page will be unchecked when the user clicks on it, if previously checked.

4.2.2.3 Criteria for evaluating results
a. If the results from 4.2.1.2 are validated, then this test is passed.

4.2.2.4 Test procedure
1. Execute the T3AM Gerrymandering Tool.
2. Click on the Terms & Conditions checkbox on the welcome page.
    a. Checkbox should currently be unchecked.
3. Validate that this checkbox stays checked after the user clicks on it.
4. Validate that this checkbox stays unchecked after the user clicks on it again.

4.2.3   Captcha Test

4.2.3.1   Prerequisite Conditions
    a.   Application must currently be running while testing this case.
    b.   Must be on the welcome page of the application.

4.2.3.2   Expected Test Results
    a.   The Captcha check on the welcome page shall be displayed and be able to accept user input to confirm the user is a real person.

4.2.3.3   Criteria for evaluating results
    a.   If the Captcha is successfully displayed without conflict and the user is able to complete the check, then this test is passed.

4.2.3.4   Test procedure
    1.   Execute the T3AM Gerrymandering Tool.
    2.   Attempt to complete the Captcha check on the welcome page.

4.2.4   "Next Page" Test

4.2.4.1   Prerequisite Conditions
    a.   Application must currently be running while testing this case.
    b.   Must be on the welcome page of the application.

4.2.4.2   Expected Test Results
    a.   After checking the Terms & Conditions checkbox and successfully completing the Captcha check, clicking on the "Continue" button on the welcome page shall take the user to the main page of the application.

4.2.4.3   Criteria for evaluating results
    a.   The user shall only be able to access the main page after checking the Terms & Conditions checkbox and completing the Captcha check. If the user is able to continue without doing both of these, then this test is failed.

4.2.4.4   Test procedure
    1.   Execute the T3AM Gerrymandering Tool.
    2.   Attempt to click the "Continue" button on the welcome page.
    3.   Check the Terms & Conditions checkbox.
    4.   Attempt to click the "Continue" button on the welcome page again.
    5.   Complete the Captcha check.
    6.   Click the "Continue" button on the welcome page and verify access to the main page.

4.2.5   Main Page Load Test

4.2.5.1   Prerequisite Conditions
    a.   Application must currently be running while testing this case.
    b.   Must be on the main page of the application.

4.2.5.2 Expected Test Results
a. The main page should load the following elements onto the webpage without any conflicts.
- i. Buttons to change distributions
- ii. Sidebar
- iii. Map of the state

4.2.5.3 Criteria for evaluating results
a. If all elements are in the right place, then this test is passed.

4.2.5.4 Test procedure
1. Execute the T3AM Gerrymandering Tool.
2. Successfully complete tests 4.2.1 through 4.2.4.
3. Validate that all elements on the main page are in their own space and not colliding with one another.

4.2.6 Map Interactions Test

4.2.6.1 Prerequisite Conditions
a. Application must currently be running while testing this case.
b. Must be on the main page of the application.

4.2.6.2 Expected Test Results
a. Button tests
- i. Clicking the "Current" button shall update the map to display the current distribution of the state.
- ii. Clicking the "Democratic" button shall update the map to display a majority Democratic distribution.
- iii. Clicking the "Republican" button shall update the map to display a majority Republican distribution.
- iv. Clicking the "Swing" button shall update the map to display a swing distribution.
- v. Clicking a button twice shall do nothing to the map.

b. Hover Tests
- i. Hovering the mouse over each district shall display the correct political party percentage distribution of the district.
- ii. Hovering the mouse over each district shall display the correct majority of the district.
- iii. Hovering the mouse outside the map shall display nothing on the map.

4.2.6.3 Criteria for evaluating results
b. If the application correctly does all tasks mentioned in 4.2.6.2, then this test is passed.

4.2.6.4 Test procedure
1. Execute the T3AM Gerrymandering Tool.
2. Successfully complete tests 4.2.1 through 4.2.5.

3. Click on the "Current" button and validate that the map correctly displays the current distribution.
    a. Click on "Current" again to validate that the map doesn't change.
4. Click on the "Democratic" button and validate that the map correctly displays the democratic distribution.
    a. Click on "Democratic" again to validate that the map doesn't change.
5. Click on the "Republican" button and validate that the map correctly displays the republican distribution.
    a. Click on "Republican" again to validate that the map doesn't change.
6. Click on the "Swing" button and validate that the map correctly displays the swing distribution.
    a. Click on "Swing" again to validate that the map doesn't change.
7. Hover the mouse over any district and validate that party percentages and the party that has the majority percentage are displayed.
8. Hover the mouse outside of the map and validate that no information is displayed.

4.2.7 "On Click" Test

4.2.7.1 Prerequisite Conditions
a. Application must currently be running while testing this case.
b. Must be on the main page of the application.

4.2.7.2 Expected Test Results
a. Clicking outside of the map shall do nothing.
b. Clicking on a district shall show the information regarding that district in the sidebar of the page.
c. Information that shall be displayed on the sidebar includes:
    i. Party percentages for that district.
    ii. Zip codes for that district.

4.2.7.3 Criteria for evaluating results
a. If the application correctly does all tasks mentioned in 4.2.7.2, then this test is passed.

4.2.7.4 Test procedure
1. Execute the T3AM Gerrymandering Tool.
2. Successfully complete tests 4.2.1 through 4.2.6.
3. Click outside of the map on the main page and validate that no information is displayed on the sidebar.
4. Click on any district on the map and validate that party percentages and zip codes for that district appear in the sidebar of the main page.

5 Requirements traceability
This section defines the requirements in the Software Requirements Specification (SRS) document that are being tested, as mentioned in this document:

4.1   Operating Systems Tests: Requirement 3.6 in the SRS (Requested by customer).

4.2.1   Welcome Page Test: Requirement 3.1.1 in the SRS (Requested by customer).

4.2.2 Terms & Conditions Checkbox Test: Requirement 3.1.1.a.ii in the SRS (Requested by customer).

4.2.3 Captcha Test: Requirement 3.3.1 in the SRS (Requested by customer).

4.2.4 "Next Page" Test: Requirement 3.1.1.a.iv in the SRS (Requested by customer).

4.2.5 Main Page Load Test: Requirement 3.1.2 in the SRS (Requested by customer).

4.2.6 Map Interactions Test: Requirements 3.1.3 and 3.1.4 in the SRS (Requested by customer).

4.2.7 "On Click" Test: Requirement 3.1.4.b in the SRS (Requested by customer).

6 Notes

- OS: Operating System
- VM: Virtual Machine