LAB 3: ODU SPRING 2019 CS411 TEAM SILVER PROJECT

Crime HotSpot Test Plan

CS411W Spring 2019 Team Silver

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4. Test Procedures

The test cases in this document will test the functionality of the system with regards to the Software Requirements Specification (SRS) for the CS411W Spring 2019 Team Silver prototype, known as Crime HotSpot. Each requirement in the SRS will be tested in at least one of the test cases. The results of the test cases will be recorded, and deficiencies resolved. A summary of the requirements traceability can be found in section five.

4.1 Homepage

Case Name:	**Search Addresses**						
Description:	Address search bar and drawer menu test for first time visits.						
Purpose:	The test case tests that the search bar brings the user to the inputted address and populates map with data for the area for a first-time visit.						
Written By:	Raphael J. Sandor	**Test Category:**	1	**Test Case:**	1.1	**Version:**	1.0
Contributing Authors							
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☒	Vairon Mendoza ☐				
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☒				
Requirements Fulfilled							
3.1.1.1, 3.1.1.2., 3.1.1.3, 3.1.1.4, 3.1.1.5, 3.1.1.6, 3.1.1.7, 3.1.1.8, 3.1.1.9							
Setup Conditions:							
1. Open Google Chrome web browser. **2.** Clear cookies. **3.** Navigate to http://128.82.11.126:3000.							
Test Case Activity							
Step	**Action**	**Pass**	**Expected**				
1	Provide an address for Old Dominion University.	☐	The search bar default example address is replaced with the user's provided address.				
2	Enter a valid address. Click the search button.	☐	The user is brought to the desired location. The map then loads the weighted crime data from Old Dominion Police department.				
3	Enter an invalid address. Click the search button.	☐	The application provides an invalid address error.				

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Step	Action	Pass	Expected
4	Click on the Crime HotSpot Logo.	☐	The drawer menu opens toward the right, remains in the top left corner of the page, and turns opaque. The menu should display links to go to other pages including the "Team Website URL", and the analytics page.
5	Click the search button.	☐	Provide address search.
6	Enter address and click submit.	☐	The desired address is displayed on the map.
7	Move mouse over map and examine location.	☐	Drawer Menu turns transparent. Heatmap should reflect area change.
Comments			

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Case Name:	**Side Navigation Bar User Interface**						
Description:	Side bar navigation should have set behavior when the user interacts with the side bar, such as opening and closing.						
Purpose:	This test case ensures that the side bar is behaving as to be expected.						
Written By:	Raphael J. Sandor	**Test Category:**	1	**Test Case:**	1.2	**Version:**	1.0

Contributing Authors			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☒	Vairon Mendoza ☐
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☐

Requirements Fulfilled

3.1.1.10, 3.1.1.11, 3.1.1.12, 3.1.1.13

Setup Conditions:

1. Open Google Chrome web browser.
2. Navigate to http://128.82.11.126:3000.

Test Case Activity

Step	Action	Pass	Expected
1	Move mouse to left side of the web page.	☐	Side navigation bar opens to the right from the left edge of the page revealing several icons representing the crimes. Text above the icons reads the type of crime.
2	Click a crime filter.	☐	The button is pressed down and map changes to reflect filter.
3	Move the mouse to right, away from the side bar navigation menu.	☐	The side bar closes.

Comments

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Case Name:	**Crime Profile Selection**						
Description:	Verifies that the crime profile button in side navigation bar updates heatmap.						
Purpose:	To verify that upon clicking a specific crime profile button, any other profile is deselected. The heatmap should also be refreshed with the appropriate crime profile data.						
Written By:	Vairon Mendoza	**Test Category:**	1	**Test Case:**	1.3	**Version:**	1.0

Contributing Authors			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☐	Vairon Mendoza ☒
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☐

Requirements Fulfilled
3.1.1.14, 3.1.1.15, 3.1.1.16

Setup Conditions:
1. Open Google Chrome web browser. **2.** Navigate to http://128.82.11.126:3000.

Test Case Activity

Step	Action	Pass	Expected
1	Hover mouse over the side navigation bar.	☐	Side navigation bar slides right, becoming opaque. It displays the following crime profile buttons: • Public Crimes • Property Crimes • Crimes Against Person • Severe Crimes
2	Click on an unselected crime profile button.	☐	The clicked crime profile button is pressed down and remains pressed down. The map is refreshed displaying the heatmap with the updated crime weights from the selected profile crime profile, as well as any other previously selected profiles. The side navigation bar remains opened.

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Step	Action	Pass	Expected
3	Click on a selected crime profile button.	☐	The clicked crime profile button is released. The map is refreshed displaying the updated heatmap with the crime weights from the clicked crime profile removed. The side navigation bar remains opened.
4	Hover mouse outside sidebar.	☐	Side navigation bar slides left, hiding all crime profile buttons, and turns transparent.
Comments			

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4.2 Heatmap

Case Name:	**Heatmap Update**						
Description:	Heatmap should update when a user changes location to reflect the crime data for that area.						
Purpose:	This test case ensures that the heatmap is updating on address changes.						
Written By:	Raphael J. Sandor	**Test Category:**	2	**Test Case:**	2.1	**Version:**	1.0
Contributing Authors							
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☒	Vairon Mendoza ☐				
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☐				
Requirements Fulfilled							
3.1.2.8, 3.1.5.1							
Setup Conditions:							
1. Open Google Chrome web browser. **2.** Clear cookies. **3.** Navigate to http://128.82.11.126:3000. **4.** Enter an address.							
Test Case Activity							
Step	**Action**	**Pass**	**Expected**				
1	Click on the map.	☐	Score detail tool tip appears at cursor location. The score detail tooltip window contains the following information: • a localized SafetyScore of the immediate area surrounding the cursor. • a count of the crime incidents, grouped by category, that factored into the SafetyScore.				
2	Close detail tip tool.	☐	Detail tip closes.				
3	Click the crime HotSpot menu in the top left of the application.	☐	Menu opens to the left.				
4	Select “Search Address” button from the menu.	☐	Opens an address search.				
5	Enter address and click submit.	☐	Map updates to location and heat map changes.				
6	Click in same area of map that was activated before changing address.	☐	The detail tip shows the safety score and number of crimes for new address.				

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Comments
Test step 1 and 6 are to show that the address change will likely to return different detail tip results. This of course depends on how far apart the new address is from the previous selected address.

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Case Name:	**Heatmap Loading**						
Description:	Load the page and ensure the heatmap is displaying correctly and responding to changes in user input.						
Purpose:	This test case checks to see if the heatmap loads at the correct time with the correct information. The heatmap must also respond and update according to the changes in the user information or changes in the location of interest.						
Written By:	David Hall	**Test Category:**	2	**Test Case:**	2.2	**Version:**	1.0

Contributing Authors			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☒	Vairon Mendoza ☐
Dave Hall ☒	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☐

Requirements Fulfilled

3.1.2.2-7, 3.1.2.9-10

Setup Conditions:

1. Open Google Chrome web browser.
2. Navigate to http://128.11.126:3000.

Test Case Activity

Step	Action	Pass	Expected
1	Load the page.	☐	The heatmap will load at the same time as or within 1 second of the bas map
2	Using the mouse, move the view of the map.	☐	The map will move but the heatmap will display displayed over the same geographic area of the base map
3	Zoom out to maximum.	☐	The heatmap colors and intensity will not change
4	Zoom in to maximum.	☐	The heatmap colors and intensity will not change, opacity may change
5	Reload page.	☐	The base map and heat map will set to the original default location and information
6	Select each crime category from the side-nav bar.	☐	Each selection will update the data provided to the heat map and the heat map will reload to reflect this data
7	Select a new location of focus.	☐	The base map and the heat map will reload centered on the new location, displaying the correct information for the new location

Comments

Case Name:	**Crime SafetyScore Updating**						
Description:	When the user changes the weights and flters of crimes and clicks apply, the Crime SafetyScore should update to reflect the changes.						
Purpose:	This test case is meant to see if the Crime SafetyScore changes when the user changes the crime weights and filters and clicks apply. The Crime SafetyScore is only shown when the user clicks on the map and therefore must be tested by comparing the pixels clicked with the SafetyScore returned.						
Written By:	Kevin Chahine	**Test Category:**	2	**Test Case:**	2.3	**Version:**	1.0

Contributing Authors:			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☐	Vairon Mendoza ☐
Dave Hall ☐	Kevin Chahine ☒	Stephanie Zeil ☐	Shayan Ghahramani ☐

Requirements Fulfilled:
3.1.1.14, 3.1.1.16, 3.1.1.18

Setup Conditions:
1. Open Google Chrome web browser. **2.** Navigate to http://128.82.11.126:3000.

Test Case Activity:

Step	Action	Pass	Expected
1	Hover mouse over side navigation bar	☐	The side navigation bar slides right displaying a crime profile, crime filters and adjustable crime weights.
2	Adjust crime filter that specifies date range of occurrence.	☐	Each chart updates to reflect the change in location.
3	Adjust crime filter that specifies time of occurrence.	☐	Time of occurrence filter will be set.
4	Select check boxes for crime filter that specifies days of week.	☐	Days of week checkboxes will be set.
5	Adjust crime weights for each crime category.	☐	Crime weight for each category will be set.
6	Click apply to update Crime SafetyScore of hover function.	☐	Now when user clicks on map SafetyScore values will suit the newly updated weights and filters.

Comments

4.3 Analytics Page

Case Name:	**Analytics Charts: Base Functionality**						
Description:	Test the base functionality of the Analytics section of the application.						
Purpose:	This case tests the ability of the application to display an analytics page view that provides a series of charts, calculated from the dataset representing the user's chosen location and date/time range.						
Written By:	Kenneth Watson	**Test Category:**	3	**Test Case:**	3.1	**Version:**	1.0

Contributing Authors:			
Thom Loftin ☐	Kenneth Watson ☒	Raphael Sandor ☐	Vairon Mendoza ☐
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☐

Requirements Fulfilled:
3.1.4.1, 3.1.4.2, 3.1.4.3, 3.1.4.4, 3.1.4.5, 3.1.4.6, 3.1.4.7, 3.1.4.8, 3.1.4.9, 3.1.4.10, 3.1.4.11, 3.1.4.12

Setup Conditions:
3. Open Google Chrome web browser. **4.** Navigate to http://128.82.11.126:3000. **5.** Enter an address, start date, and end date into the search fields.

Test Case Activity:

Step	Action	Pass	Expected
1	Click the Crime HotSpot logo in the header and then click the Analytics link.	☐	The analytics section will appear with a set of charts, using data from the current location of interest and date range, as entered on the map. These charts include: • a chart comparing crime categories across the current dataset. • a chart comparing time of day of occurrence across the current dataset • a chart comparing top crimes across each crime category of the current dataset. • a chart comparing number of incidents, by month or week across the currently chosen date range.
2	On the analytics page, enter a new location into the location search field and click the Query button to submit.	☐	Each chart updates to reflect the change in location.

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Step	Action	Pass	Expected
3	On the analytics page, enter a new start and end date into the date fields by manually typing the dates in mm:dd:yyyy format. Click the Query button to submit.	☐	Each chart updates to reflect the change in date range.
4	On the analytics page, clear the start and end date fields by backspacing on the keyboard. Then, by using the calendar widget located next to each date field, enter in the same dates as in step 5. Click the Query button to submit.	☐	The content of the charts does not change in any way from step 5.
5	On the analytics page, enter in 11:00am – 5:00pm into the hour field. Click the Query button to submit.	☐	The contents of the charts do not change, and an alert pop up appears informing the user of an invalid date format (hour field).
6	On the analytics page, enter in 1100 – 1700 into the hour field. Click the Query button to submit.	☐	The charts update to reflect the change in time range.
7	Pick two charts of the same type. Click a data attribute from each chart's legend. Click the Query button to submit.	☐	A new chart is added to the analytics page that is of the same type as the two input charts but differs in the data that it reflects. The new chart combines the two attributes as a result of the query.
8	Repeat step 7 for each type of chart on the analytics page.	☐	A new chart is added for each type that complies with the expected result in step 7.
Comments			

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4.4 Score Detail Tooltip

Case Name:	**Score Detail Tooltip**						
Description:	Test the functionality of the Score Detail tooltip.						
Purpose:	This case tests the ability of the user interface and specific SafetyScore implementations to display a pop-up tooltip with localized crime information.						
Written By:	Kenneth Watson	**Test Category:**	4	**Test Case:**	4.1	**Version:**	1.0
Contributing Authors:							
Thom Loftin ☐	Kenneth Watson ☒	Raphael Sandor ☐	Vairon Mendoza ☐				
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☐				
Requirements Fulfilled:							
3.1.5.1, 3.1.5.2, 3.1.5.3							
Setup Conditions:							
1. Open a Google Chrome web browser. **2.** Navigate to http://128.82.11.126:3000.							
Test Case Activity:							

Step	Action	Pass	Expected
1	Click on the map, in an area with a high intensity heat.	☐	A pop up appears with the following results: A Localized SafetyScore value is shown that trends toward the upper range of values (unsafe) An Average Crime Rating is shown. This value will serve as an upper bound for the purposes of the test case. A list of crime categories appears with at least one category listing a non-zero number of incidents.
2	Click on the X icon in the top right corner of the pop up.	☐	The pop-up tooltip should close.
3	Click on the map, in an area with a very low intensity heat.	☐	A pop up appears with the following results: A Localized SafetyScore value is shown that trends toward the lower range of values (safer) An Average Crime Rating is shown. This value will serve as a lower bound for the purposes of the test case. The value should be lower than the value in step 1. A list of crime categories appears with at least one category listing a non-zero number of incidents.

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Step	Action	Pass	Expected
4	Without directly closing the pop up, click on the map, in an area with a heat intensity between the chosen intensities in steps 1 and 3.	☐	A pop up appears with the following results: A Localized SafetyScore value is shown that is between the expected values in steps 1 and 3. An Average Crime Rating is shown. The value should be between the values in steps 1 and 3. A list of crime categories appears with at least one category listing a non-zero number of incidents.
5	Click on the map, in an area far outside the range of the crime dataset.	☐	A pop up appears with the following results: A Localized SafetyScore value of 0 is shown. An Average Crime Rating value of 0 is shown. A list of crime categories appears with all categories listing zero number of incidents.
Comments			

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Case Name:	**Detail Tool Tip Out of Dataset**						
Description:	The tool tip informs a user that an area is out of supported region.						
Purpose:	This test should confirm that map clicks outside of Crime HotSpot's supported regions will open a detail tool tip that will render that there is no data for the region.						
Written By:	Raphael J. Sandor	**Test Category:**	4	**Test Case:**	4.2	**Version:**	1.0

Contributing Authors			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☒	Vairon Mendoza ☐
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☐

Requirements Fulfilled
3.1.5.3

Setup Conditions:

1. Open Google Chrome web browser.
2. Clear cookies.
3. Navigate to http://128.82.11.126:3000
4. Enter the address "Centralia, Pennsylvania".

Test Case Activity

Step	**Action**	**Pass**	**Expected**
1	Click on the map.	☐	Detail tool tip opens and displays a message reading that no crime data is provided for this location.

Comments

Centralia, Pennsylvania was selected for this test case as there is not an acting law agency in this ghost town that had its zip code revoked in 1992 and has a population of ten (10). It is highly unlikely that Crime HotSpot will sponsor crime data from this location in the foreseeable future. In such an event, this test case will be rewritten.

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4.5 Mobile Application

Case Name:	**GPS Location and Location Permissions**						
Description:	Test locations and permissions in mobile application.						
Purpose:	This case tests the responses to changes in location and location permissions in the mobile version of Crime HotSpot.						
Written By:	Stephanie Zeil	**Test Category:**	5	**Test Case:**	5.1	**Version:**	1.0

Contributing Authors			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☐	Vairon Mendoza ☐
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☒	Shayan Ghahramani ☐

Requirements Fulfilled
3.1.6.1, 3.1.6.2, 3.1.6.5

Setup Conditions:

1. Start Android device emulator with Crime HotSpot mobile application installed.
2. Start GPS emulator and send location (36.88654, -76.30522) to device.
3. Disable GPS services on the device.
4. Set Crime HotSpot application permissions to disabled.

Test Case Activity

Step	Action	Pass	Expected
1	Start the application.	☐	The application opens. Map and data displays remain at default. Dialog box appears requesting permission to access location.
2	Tap Allow.	☐	Dialog box disappears. New dialog box appears prompting to allow the device to turn on location service.
3	Tap OK.	☐	Map centers on Old Dominion University. SafetyScore number updates to reflect the safety level at the location.
4	Send a new GPS location (36.88854, -76.30522) using the GPS emulator.	☐	Map shifts northward. SafetyScore number updates.
5	Send a new GPS location (0,0) using the GPS emulator.	☐	Map centers on the Atlantic Ocean. SafetyScore shows “no data” placeholder. Warning text appears stating the user’s location is outside the available the data.
6	Disable GPS services on the device.	☐	Map remains in place. Dialog box appears prompting to allow the device to turn on location service.
7	Tap Cancel.	☐	No change.
8	Send any new GPS location using the GPS emulator.	☐	No change.

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Comments

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Case Name:	**Relative Risk Levels**						
Description:	The application needs to be able to display how day of the week and time of day impact risks associated with a given location.						
Purpose:	The test ensures that application can process and display analytical data for an area to inform a user of dangers associated with a location for a given time.						
Written By:	Raphael Sandor	**Test Category:**	5	**Test Case:**	5.2	**Version:**	1.0

Contributing Authors			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☒	Vairon Mendoza ☐
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☒	Shayan Ghahramani ☐

Requirements Fulfilled
3.1.6.3

Setup Conditions:

1. Start Android device emulator with Crime HotSpot mobile application installed.
2. Start GPS emulator and send location (36.88654, -76.30522) to device.
3. Disable GPS services on the device.
4. Set Crime HotSpot application permissions to disabled.

Test Case Activity

Step	**Action**	**Pass**	**Expected**
1	Start the application.	☐	The application opens. Map and data displays remain at default. Dialog box appears requesting permission to access location.
2	Tap Allow.	☐	Dialog box disappears. New dialog box appears prompting to allow the device to turn on location service.
3	Tap OK.	☐	Map centers on Old Dominion University. SafetyScore number updates to reflect the safety level at the location.
4	Click the Relative Time Risk button in the top corner.	☐	The heatmap should update the map to current risk associated with the given location.

Comments

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Case Name:	**Search in Mobile Application**						
Description:	Test searching in the mobile application.						
Purpose:	This case tests searching locations using the mobile version of Crime HotSpot.						
Written By:	Stephanie Zeil	**Test Category:**	5	**Test Case:**	5.3	**Version:**	1.0

Contributing Authors			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☐	Vairon Mendoza ☐
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☒	Shayan Ghahramani ☐

Requirements Fulfilled

3.1.6.4, 3.1.6.6

Setup Conditions:

1. Start Android device emulator with Crime HotSpot mobile application installed.
2. Start Crime HotSpot mobile application.
3. Grant all requests for permissions.

Test Case Activity

Step	Action	Pass	Expected
1	Tap search bar.	☐	Keyboard opens.
2	Enter an address and submit.	☐	Keyboard closes. Map centers on new address. SafetyScore updates to reflect the safety level determined at that center point.
3	Tap search bar.	☐	Keyboard opens.
4	Enter a street intersection and submit.	☐	Keyboard closes. Map centers on intersection. SafetyScore updates.
5	Tap search bar.	☐	Keyboard opens.
6	Enter a zip code and submit.	☐	Keyboard closes. Map centers in zip code. SafetyScore updates.
7	Tap the Current Location button.	☐	Map centers on user's last detected location. SafetyScore updates.

Comments

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4.6 Web Application Service

Case Name:	**Scale Crimes by Age**						
Description:	Apply various steps to test the different scalar options used to scale crimes.						
Purpose:	This case tests the ability of the system to properly apply a scalar to a crime's severity according to the date of the crime in relation to the period of interest.						
Written By:	Thom Loftin	**Test Category:**	6	**Test Case:**	6.1	**Version:**	1.0
Contributing Authors							
Thom Loftin ☒	Kenneth Watson ☐	Raphael Sandor ☐	Vairon Mendoza ☐				
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☐				
Requirements Fulfilled							
3.1.2.2, 3.1.3.1 3.1.3.2, 3.1.3.3, 3.1.3.4, 3.1.7.4, 3.1.8.1, 3.1.8.2, 3.1.8.3, 3.1.8.4, 3.1.8.5, 3.1.8.6, 3.1.8.7, 3.1.8.8, 3.1.8.9							
Setup Conditions:							
1. Open Google Chrome web browser. **2.** Navigate to http://128.8.11.126:3000.							

Test Case Activity

Step	Action	Pass	Expected
1	Click on a colored section of the heatmap.	☐	A pop-up will open displaying the following: A safety score that is between 0.0 and 10.0 The number of crimes int each category within the effective radius of the click that are of a value greater than 0.0
2	Move cursor to the sidebar.	☐	The sidebar will open.
3	Click each of the crime toggles to off and click apply.	☐	The heatmap will disappear.
4	Move cursor to the sidebar.	☐	The sidebar will open.
5	Click each of the crime toggles to off and click apply.	☐	The heatmap will disappear.
6	Move cursor to the sidebar.	☐	The sidebar will open.
7	In the End Date field set the date to 2016/12/31 and click apply,	☐	The sidebar will close. The heatmap will disappear as all crimes are after the end date.
8	Move the cursor to the sidebar.	☐	The sidebar will open
9	Set the End Date to 2017/12/31 and click apply.	☐	The sidebar will close The heat map will reappear depicting the scaled crime levels of all crime in police report.
10	Move the cursor to the sidebar.	☐	The sidebar will open.

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Step	Action	Pass	Expected
11	Set the Start Date to 2017/12/31 and click apply.	☐	The sidebar will close. There will be a heatmap with a small subset of crimes each at a full score as any crimes on the End Date get a scalar of 1.
12	Move the cursor to the sidebar.	☐	The sidebar will open.
13	Set the End Date to 2018/06/01	☐	The sidebar will close. The heatmap will remain but the colors representing the crimes will fade down the scale because as crimes age they become less relevant an there is no new crime data after 2017/12/31.
14	Move the cursor to the sidebar.	☐	The sidebar will open.
15	Set the Start Date to 2018/01/2 and click apply.	☐	The heatmap will disappear as all crimes before the Start Date get a scalar of 0. Text appears alerting that no data is available for the selected date range.
Comments			

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4.7 User Preferences

Case Name:	**Support for Color Blindness**						
Description:	Test the functionality of the heatmap color schemes for accessibility.						
Purpose:	This case tests the ability of the user interface to update the heatmap colors to a different color scheme in support of color blindness.						
Written By:	Kenneth Watson	**Test Category:**	7	**Test Case:**	7.1	**Version:**	1.0
Contributing Authors:							
Thom Loftin ☐	Kenneth Watson ☒	Raphael Sandor ☐	Vairon Mendoza ☐				
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☐	Shayan Ghahramani ☐				
Requirements Fulfilled:							
3.1.7.2							
Setup Conditions:							
1. Open Google Chrome web browser. **2.** Navigate to http://128.82.11.126:3000.							
Test Case Activity:							
Step	**Action**	**Pass**	**Expected**				
1	Open the sidebar by hovering the mouse to the left of the map.	☐	The heatmap options appear.				
2	Choose a new heatmap color scheme from under the Accessibility options.	☐	The heatmap should immediately alter its color scheme, and the color scale at the bottom of the map should reflect the change as well.				
Comments:							

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Case Name:	**Search with Date and Time Filters**						
Description:	Test the user's ability to search the map and filter by date and time.						
Purpose:	This case tests that users can search locations by address, intersection, and zip code, and filter these results by date and time.						
Written By:	Stephanie Zeil	**Test Category:**	7	**Test Case:**	7.2	**Version:**	1.0

Contributing Authors			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☐	Vairon Mendoza ☐
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☒	Shayan Ghahramani ☐

Requirements Fulfilled
3.1.7.1, 3.1.7.3, 3.1.7.6

Setup Conditions:

1. Open Google Chrome web browser.
2. Navigate to http://128.82.11.126:3000.

Test Case Activity

Step	Action	Pass	Expected
1	Enter an address in the search bar. Click the search button.	☐	The map centers on the address. SafetyScore information for this location is represented as a heatmap overlay.
2	Enter an intersection in the search bar. Click the search button.	☐	The map centers on the intersection. SafetyScore information for this location is represented as a heatmap overlay.
3	Enter a zip code in the search bar. Click the search button.	☐	The map centers in the zip code. SafetyScore information for this location is represented as a heatmap overlay.
4	Click a location on the map.	☐	SafetyScore information appears as a tooltip.
5	Move cursor to sidebar.	☐	The sidebar will open.
6	Set the start date to a date between 2017/01/02 and 2017/12/31. Set the end date to a date after the start date.	☐	The heatmap will update to reflect only crimes during that date range. Point intensities will be scaled based on their recency relative to the end date.
7	Set the start time to an hour between 1:00am and 11:00pm. Set the end time to some hour after the start time.	☐	The heatmap will update and display fewer points.

Comments

This test case addresses the basic ability to search and filter results by date and time. It assumes that the test inputs are valid and will produce results. Invalid and unexpected inputs are handled in other test cases focused on the behavior of individual features.

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Case Name:	**User-Weighted Crime Types**						
Description:	Test the user's ability to filter crimes by type.						
Purpose:	This case tests that users can filter their search by crime type and apply weights to each of these types.						
Written By:	Stephanie Zeil	**Test Category:**	7	**Test Case:**	7.3	**Version:**	1.0

Contributing Authors			
Thom Loftin ☐	Kenneth Watson ☐	Raphael Sandor ☐	Vairon Mendoza ☐
Dave Hall ☐	Kevin Chahine ☐	Stephanie Zeil ☒	Shayan Ghahramani ☐

Requirements Fulfilled

3.1.7.5, 3.1.7.7, 3.1.7.8

Setup Conditions:

1. Open Google Chrome web browser.
2. Navigate to http://128.82.11.126:3000.

Test Case Activity

Step	Action	Pass	Expected
1	Move cursor to the sidebar. Click a crime category.	☐	The heatmap intensity lessens as only crimes of the category selected are shown.
2	Hover on the crime category.	☐	The section of the sidebar expands to provide additional information on the category and a severity slider set at value 1.0.
3	Slide the slider to the rightmost position, value 2.0.	☐	The heatmap intensity increases as the value of each point doubles.
4	Slide the slider to the leftmost position, value 0.	☐	The heatmap disappears as the value of all points are equal to 0.
5	Move cursor away from sidebar. Return cursor to sidebar and click a crime category not selected in step 1.	☐	The heatmap reappears with a different distribution of points than in step 1.
6	Hover on the crime category.	☐	The section of the sidebar expands to provide additional information on the category and a severity slider set at value 1.0.
7	Slide the slider to the rightmost position, value 2.0.	☐	The heatmap intensity increases as the value of each currently displayed point doubles.
8	Move cursor away from sidebar. Return cursor to sidebar and click a crime category not selected in step 1 or 5.		The heatmap grows as more points are added. Newly added points have a lower intensity than those which were already visible.
9	Hover on the crime category.	☐	The section of the sidebar expands to provide additional information on the category and a severity slider set at value 1.0.
10	Slide the slider to the rightmost position, value 2.0.	☐	The heatmap intensity increases as the value of all displayed points are double the default.

Step	Action	Pass	Expected
11	Slide the slider to the leftmost position, value 0.	☐	The heatmap appears the same as it did after step 7.
12	Move cursor away from sidebar. Return cursor to sidebar and click a crime category not selected in step 1, 5, or 8.	☐	The heatmap grows as more points are added. Newly added points have a lower intensity than those which were already visible.
13	Hover on the crime category.	☐	The section of the sidebar expands to provide additional information on the category and a severity slider set at value 1.0.
14	Slide the slider to a middle-right position, between values 1.0 and 2.0.	☐	The heatmap intensity increases slightly.
15	Slide the slider to a middle-left position, between values 0 and 1.0.	☐	The heatmap intensity lessens to a visual between the results of steps 11 and 12.
Comments			

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4.8 Page Load Time

Case Name:	**Loading Time**						
Description:	The time to load the page.						
Purpose:	This test case ensures that pages are loading fast enough.						
Written By:	Raphael J. Sandor	**Test Category:**	8	**Test Case:**	8.1	**Version:**	1.0

Contributing Authors			
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Requirements Fulfilled
3.2.1.1

Setup Conditions:
1. Open Google Chrome web browser. **2.** Start stopwatch. **3.** Navigate to http://128.82.11.126:3000**.**

Test Case Activity			
Step	**Action**	**Pass**	**Expected**
1	Page opens, stopwatch stops.	☐	Page loads in less than 5 seconds.

Comments

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5. Traceability to Requirements

The following table lists the requirements in the SRS and the name of the test case that proves the requirement.

SRS REQ	Test Case Name
Homepage	
3.1.1.1	Search Addresses
3.1.1.2	Search Addresses
3.1.1.3	Search Addresses
3.1.1.4	Search Addresses
3.1.1.5	Search Addresses
3.1.1.6	Search Addresses
3.1.1.7	Search Addresses
3.1.1.8	Search Addresses
3.1.1.9	Search Addresses
3.1.1.10	Side Navigation Bar User Interface
3.1.1.11	Side Navigation Bar User Interface
3.1.1.12	Side Navigation Bar User Interface
3.1.1.13	Side Navigation Bar User Interface
3.1.1.14	Crime Profile Selection
3.1.1.15	Crime Profile Selection
3.1.1.16	Crime Profile Selection
Heatmap	
3.1.2.1	Side Navigation Bar User Interface
3.1.2.2	Search Addresses
3.1.2.3	Heatmap Loading
3.1.2.4	Heatmap Loading
3.1.2.5	Heatmap Loading
3.1.2.6	Heatmap Loading
3.1.2.7	Heatmap Loading
3.1.2.8	Heatmap Update
3.1.2.9	Heatmap Loading
3.1.2.10	Heatmap Loading
Safety Score	
3.1.3.1	Scale Crimes by Age
3.1.3.2	Scale Crimes by Age
3.1.3.3	Scale Crimes by Age
3.1.3.4	Scale Crimes by Age

Analytics Page	
3.1.4.1	Analytics Charts: Base Functionality
3.1.4.2	Analytics Charts: Base Functionality
3.1.4.3	Analytics Charts: Base Functionality
3.1.4.4	Analytics Charts: Base Functionality
3.1.4.5	Analytics Charts: Base Functionality
3.1.4.6	Analytics Charts: Base Functionality
3.1.4.7	Analytics Charts: Base Functionality
3.1.4.8	Analytics Charts: Base Functionality
3.1.4.9	Analytics Charts: Base Functionality
3.1.4.10	Analytics Charts: Base Functionality
3.1.4.11	Analytics Charts: Base Functionality
3.1.4.12	Analytics Charts: Base Functionality
Score Detail Tooltip	
3.1.5.1	Heatmap Update
3.1.5.2	Heatmap Update
3.1.5.3	Detail Tool Tip Out of Dataset
Mobile Application	
3.1.6.1	GPS Location and Location Permissions
3.1.6.2	GPS Location and Location Permissions
3.1.6.3	Relative Risk Levels
3.1.6.4	Search in Mobile ApplicationSearch
3.1.6.5	GPS Location and Location Permissions
3.1.6.6	Search in Mobile ApplicationSearch
User Preferences	
3.1.7.1	Search with Date and Time Filters
3.1.7.2	Support for Color Blindness
3.1.7.3	Search with Date and Time Filters
3.1.7.4	Scale Crimes by Age
3.1.7.5	User-Weighted Crime Types
3.1.7.6	Search with Date and Time Filters
3.1.7.7	User-Weighted Crime Types
3.1.7.8	User-Weighted Crime Types

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Web Application Service	
3.1.8.1	Scale Crimes by Age
3.1.8.2	Scale Crimes by Age
3.1.8.3	Scale Crimes by Age
3.1.8.4	Scale Crimes by Age
3.1.8.5	Scale Crimes by Age
3.1.8.6	Scale Crimes by Age
3.1.8.7	Scale Crimes by Age
3.1.8.8	Scale Crimes by Age
3.1.8.9	Scale Crimes by Age
Page Load Time	
3.2.1.1	Loading Time