

# Lab 3 - Testing

To: Professor Mike Boctor  
March 24<sup>th</sup>, 2016

By:  
**Group 5**  
Evan Kennedy  
Brian Magnusen  
Punleuk Oum

## Sprint 1 Test Cases

<b>Test Case Number</b>	S1T1
<b>Test Item</b>	<p>Only valid image types accepted into the image container from file system and URL.</p> <p>This test case ensures users cannot add generic files or unsupported image types into the image container.</p>
<b>Pre-conditions</b>	Image container should be empty
<b>Post-conditions</b>	Refresh browser to reset container
<b>Input Specifications</b>	<ul style="list-style-type: none"><li>● Drag and drop an image onto the page</li><li>● Drag and drop a text file onto the page</li><li>● Enter an image URL</li><li>● Enter a non-image URL</li></ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"><li>● Image container should contain 2 images</li></ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"><li>● Two error messages saying "Invalid image type"</li><li>● Two image previews added matching the images selected</li><li>● dropzone.files should have a length of 2</li></ul>
<b>Assumptions and Constraints</b>	<ul style="list-style-type: none"><li>● Network connection to URLs is successful</li></ul>
<b>Dependencies</b>	None

<b>Test Case Number</b>	S1T2
<b>Test Item</b>	<p>Correct in-memory handling of images in the image container.</p> <p>This tests adds mock images and checks the image container to make sure they have been correctly inserted in memory.</p>
<b>Pre-conditions</b>	The image container should be empty
<b>Post-conditions</b>	Refresh browser to remove images
<b>Input Specifications</b>	<ul style="list-style-type: none"><li>● Add a mock new File() to dropzone with appropriate parameters.</li><li>● Add an Object.create(null) to dropzone.</li></ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"><li>● dropzone.files should contain an array of two items</li></ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"><li>● Item 0 is File type</li><li>● Item 1 is Object type</li></ul>
<b>Assumptions and Constraints</b>	None
<b>Dependencies</b>	None

<b>Test Case Number</b>	S1T3
<b>Test Item</b>	Clicking stitch should produce a panorama.  This tests what our program is all about, image stitching.
<b>Pre-conditions</b>	Prepare image set
<b>Post-conditions</b>	None
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>• Add all images into image container</li> <li>• Click stitch</li> <li>• Wait for progress messages to complete and overlay to hide</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>• Panorama should show</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>• Panorama is rendered in correct render type viewer</li> <li>• Panorama is rendered immediately when overlay hides</li> </ul>
<b>Assumptions and Constraints</b>	<ul style="list-style-type: none"> <li>• No errors occur when adding images into the container</li> </ul>
<b>Dependencies</b>	None

## Sprint 2 Test Cases

<b>Test Case Number</b>	S2T1
<b>Test Item</b>	Proper handling of corrupt image file.  This test verifies that when a user submits a corrupt image in an image set for stitching, the application handles the scenario properly and displays an appropriate message to the user as a result.
<b>Pre-conditions</b>	Server available at BASE_URL and configured with up-to-date version of the panimage repository for correct image hosting.
<b>Post-conditions</b>	Remove all source images from source image bar.
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>• Reference image set (real). These images are used in conjunction with the corrupt image in order to facilitate generation of adequate stitch submission requests. Filenames: BASE_URL/testing/reference/reference1.png BASE_URL/testing/reference/reference2.png BASE_URL/testing/reference/reference3.png BASE_URL/testing/reference/reference4.png BASE_URL/testing/reference/reference5.png</li> <li>• Corrupt image file (real). This file is used to verify the stitch operation produces appropriate output when the user submits a corrupt, non-empty image file. Filename: BASE_URL/testing/invalid/corrupt.png</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>• Stitch operation status message</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>• Stitch operation status message indicates stitch operation failure (no specific cause is identified for this test case)</li> </ul>
<b>Assumptions and Constraints</b>	None
<b>Dependencies</b>	None

<b>Test Case Number</b>	S2T2
<b>Test Item</b>	<p>Proper handling of oversized image file.</p> <p>This test verifies that when a user submits an oversized image in an image set for stitching, the application handles the scenario properly and displays an appropriate message to the user as a result.</p>
<b>Pre-conditions</b>	Server available at BASE_URL and configured with up-to-date version of the panimage repository for correct image hosting.
<b>Post-conditions</b>	Remove all source images from source image bar.
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>Reference image set (real). These images are used in conjunction with the oversized image in order to facilitate generation of adequate stitch submission requests. Filenames: BASE_URL/testing/reference/reference1.png BASE_URL/testing/reference/reference2.png BASE_URL/testing/reference/reference3.png BASE_URL/testing/reference/reference4.png BASE_URL/testing/reference/reference5.png</li> <li>Oversized image file (real). This file is used to verify the stitch operation produces appropriate output when the user submits an oversized image file. Filename: BASE_URL/testing/invalid/oversized.png</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>Stitch operation status message</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>Stitch operation status message indicates stitch operation failure due to oversized image file</li> </ul>
<b>Assumptions and Constraints</b>	None
<b>Dependencies</b>	None

<b>Test Case Number</b>	S2T3
<b>Test Item</b>	<p>Proper handling of empty image file.</p> <p>This test verifies that when a user submits an empty image in an image set for stitching, the application handles the scenario properly and displays an appropriate message to the user as a result.</p>
<b>Pre-conditions</b>	Server available at BASE_URL and configured with up-to-date version of the panimage repository for correct image hosting.
<b>Post-conditions</b>	Remove all source images from source image bar.
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>Reference image set (real). These images are used in conjunction with the oversized image in order to facilitate generation of adequate stitch submission requests. Filenames: BASE_URL/testing/reference/reference1.png BASE_URL/testing/reference/reference2.png BASE_URL/testing/reference/reference3.png BASE_URL/testing/reference/reference4.png BASE_URL/testing/reference/reference5.png</li> <li>Empty image file (real). This file is used to verify the stitch operation produces appropriate output when the user submits an empty image file. Filename: BASE_URL/testing/invalid/empty.png</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>Stitch operation status message</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>Stitch operation status message indicates stitch operation failure due to empty image file</li> </ul>
<b>Assumptions and Constraints</b>	None
<b>Dependencies</b>	None

<b>Test Case Number</b>	S2T4
<b>Test Item</b>	<p>Proper handling of image set with too many images.</p> <p>This test verifies that when a user submits an image set containing too many images for stitching, the application handles the scenario properly and displays an appropriate message to the user as a result.</p>
<b>Pre-conditions</b>	Server available at BASE_URL and configured with up-to-date version of the panimage repository for correct image hosting.
<b>Post-conditions</b>	Remove all source images from source image bar.
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>Large image set (real). These image files are used to verify the stitch operation produces appropriate output when the user submits too many images for a stitch operation. Filename: BASE_URL/testing/many/01.png through BASE_URL/testing/many/31.png</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>Stitch operation status message</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>Stitch operation status message indicates stitch operation failure due to too many image files</li> </ul>
<b>Assumptions and Constraints</b>	None
<b>Dependencies</b>	None

## Sprint 3 Test Cases

<b>Test Case Number</b>	S3T1
<b>Test Item</b>	<p>Verify correct panorama generation from a specific set of reference images.</p> <p>This test accomplishes the following:</p> <ul style="list-style-type: none"><li>• Verifies that the stitching application produces a correct and consistent resulting panorama.</li><li>• Verifies that the resulting panorama is not degraded during transfer to the client.</li><li>• Verifies image stitching path functionality</li></ul>
<b>Pre-conditions</b>	Server available at BASE_URL and configured with up-to-date version of the panimage repository for correct image hosting.
<b>Post-conditions</b>	Remove all source images from source image bar.
<b>Input Specifications</b>	<ul style="list-style-type: none"><li>• Reference image set (real). These images are used to produce the panorama under test. Filenames: BASE_URL/testing/reference/reference1.png BASE_URL/testing/reference/reference2.png BASE_URL/testing/reference/reference3.png BASE_URL/testing/reference/reference4.png BASE_URL/testing/reference/reference5.png  Test operator adds the above images to the source image bar prior to test execution.</li><li>• Known-good panorama (real). This panorama is used as a known-good standard which the panorama under test can be compared against. Filename: BASE_URL/testing/reference/planar.jpg</li></ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"><li>• Checksum of known-good panorama</li><li>• Checksum of panorama under test</li></ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"><li>• Checksum of known-good panorama and panorama under test must be identical</li></ul>
<b>Assumptions and Constraints</b>	None
<b>Dependencies</b>	None

<b>Test Case Number</b>	S3T2
<b>Test Item</b>	<p>Verify minimum required large file size support.</p> <p>This test verifies that the end-to-end stitching execution path is able to support the minimum required large file size stitch configuration, which is 5 images, with each image being 6 MB in size.</p>
<b>Pre-conditions</b>	Server available at BASE_URL and configured with up-to-date version of the panimage repository for correct image hosting.
<b>Post-conditions</b>	Remove all source images from source image bar.
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>Large file size image set (real). These images are used to produce the panorama under test. Filenames: BASE_URL/testing/maxsize/maxsize1.png BASE_URL/testing/maxsize/maxsize2.png BASE_URL/testing/maxsize/maxsize3.png BASE_URL/testing/maxsize/maxsize4.png BASE_URL/testing/maxsize/maxsize5.png</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>Stitch operation status message</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>Stitch operation status message indicates success</li> </ul>
<b>Assumptions and Constraints</b>	None
<b>Dependencies</b>	None

<b>Test Case Number</b>	S3T3
<b>Test Item</b>	<p>Verify minimum required large file set support.</p> <p>This test verifies that the end-to-end stitching execution path is able to support the minimum required large file set stitch configuration, which is 30 images.</p>
<b>Pre-conditions</b>	Server available at BASE_URL and configured with up-to-date version of the panimage repository for correct image hosting.
<b>Post-conditions</b>	Remove all source images from source image bar.
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>Large quantity image set (real). These images are used to produce the panorama under test. Filenames: BASE_URL/testing/many/01.png through BASE_URL/testing/many/30.png</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>Stitch operation status message</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>Stitch operation status message indicates success</li> </ul>
<b>Assumptions and Constraints</b>	None
<b>Dependencies</b>	None



<b>Test Case Number</b>	S3T4
<b>Test Item</b>	All API responses contain no data that has been erroneously converted to strings.  This test ensures we get meaningful error messages without text like [object object].
<b>Pre-conditions</b>	Add test to all REST Unit Tests
<b>Post-conditions</b>	N/A
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>● Run REST Unit Tests</li> <li>● In response, look for any [String String] data</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>● Data is meaningful</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>● No [String String] data exists</li> </ul>
<b>Assumptions and Constraints</b>	<ul style="list-style-type: none"> <li>● There may be other non-meaningful data that we need to find in the future.</li> </ul>
<b>Dependencies</b>	<ul style="list-style-type: none"> <li>● All REST Unit Tests</li> </ul>

## Sprint 4 Test Cases

<b>Test Case Number</b>	S4T1
<b>Test Item</b>	Delete all database sessions while users are logged in and ensure no data loss for logged in users once logging in again
<b>Pre-conditions</b>	Create test user
<b>Post-conditions</b>	Delete test user
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>● Log in to test user</li> <li>● Create a new panorama</li> <li>● Stitch the panorama</li> <li>● Delete all sessions from DynamoDB</li> <li>● Log in to test user</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>● Panorama exists after login</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>● Panorama contains all the same source image files</li> </ul>
<b>Assumptions and Constraints</b>	None
<b>Dependencies</b>	None

<b>Test Case Number</b>	S4T2
<b>Test Item</b>	<p>Large number of concurrent requests.</p> <p>This test case will stress test S3 during upload and Lambda during stitch. It simulates many users clicking stitch at once.</p>
<b>Pre-conditions</b>	Prepare test image set with 6 image
<b>Post-conditions</b>	Remove used panoramas from S3
<b>Input Specifications</b>	<ul style="list-style-type: none"> <li>• Instantiate 100 concurrent sessions</li> <li>• Populate with test image set</li> <li>• Once all populated, send all stitch requests</li> </ul>
<b>Expected Output Specifications</b>	<ul style="list-style-type: none"> <li>• All stitch requests complete successfully</li> </ul>
<b>Pass/Fail Criteria</b>	<ul style="list-style-type: none"> <li>• Stitched panoramas are 99% the same (all have some difference)</li> <li>• Stitching takes place in a reasonable amount of time (around 1 normal request)</li> </ul>
<b>Assumptions and Constraints</b>	<ul style="list-style-type: none"> <li>• Network speed can handle that many image POST requests.</li> </ul>
<b>Dependencies</b>	<ul style="list-style-type: none"> <li>• Software to send concurrent requests.</li> </ul>