Graph Algorithm Visualization Test Scripts

Name	TC-1 Create a graph
Requirement	FR1, FR1.1, FR 1.2, FR1.1.1, FR1.1.2
Preconditions	Must have application open.
Steps	1. To create a weighted graph, check the "Weighted" box. 2. To create a directed graph, check the "Directed" box. 3. Add nodes by clicking the "add nodes" button and entering in values for each node when prompted. 4. Add edges by click the "add edges" button, clicking a start and end node, and specifying a weight.
Expected Result	1. Nodes appear on the screen along with their values 2. Edges appear on the screen connecting nodes. Directed graphs will have the correct directions stored, but no arrowheads will appear on the screen (sorry). 3. Edge weights appear on the screen next to their corresponding edges

Name	TC-2 Create a vertex
Requirement	FR2
Preconditions	Must have application open
Steps	1. Click the "Add nodes" button. 2. Click anywhere on the window to add a vertex there. 3. When prompted, enter in the value of the vertex. 4. Hit OK.
Expected Result	1. A vertex (node) appears on the

	screen along with its value.

Name	TC-3 Create a Edge
Requirement	FR4
Preconditions	Must have at least two nodes created.
Steps	1. Click the Add Edges Button. 2. Click on a node to be the starting node for the edge. 3. Click on a node to be the ending node for the edge. (This order is not crucial if your graph is undirected). 4. If you checked the "Weighted" box before graph creation (for a weighted graph), specify the weight for the edge when prompted and hit OK.
Expected Result	1. Edge is displayed connecting the nodes. 2. If it is weighted, the edge will display its weight above it. 3. If it is directed, the edge will be recorded properly in the system, but no arrowheads appear showing the direction (sorry)

Name	TC-4 Delete Graph
Requirement	FR6
Preconditions	Must have at least one node created or a graph on the screen already.
Steps	1. Click on the "Delete All" button.
Expected Result	1. All graph information is deleted and the visualization will be cleared. 2. The user can add new elements and change the properties (directed/weighted) of the new graph.

Name	TC-5 Dijkstra's Shortest Path
Requirement	FR8
Preconditions	Must have a graph created.
Steps	1. Click on the drop down menu under "Select Algorithm" 2. Pick Dijkstra's SP. 3. Hit "Run Algorithm" 4. Select a starting node on the graph to indicate where the path will begin. 5. Select the target node to find on the graph. 6. The algorithm will highlight each node and edge as it traverses through the steps. Click "Play" to run the visualization automatically, "Pause" to pause the automatic visualization, "Step Forward" to step forward one step at any time, or "Step Backward" to step backward one step at any time.
Expected Result	1. Nodes and edges on the graph will be highlighted in red as the algorithm traverses them. 2. Upon completion, the shortest path between the start and target node will be highlighted in red.

Name	TC-6 Depth First Search
Requirement	FR9
Preconditions	Must have a graph created
Steps	1. Click on the drop down menu under "Select Algorithm" 2. Pick Depth First Search. 3. Hit "Run Algorithm" 4. Select a starting node on the graph to indicate where the path will begin. 5. Select the target node to find on the graph.

	6. The algorithm will highlight each node and edge as it traverses through the steps of the depth first search traversal. 7. Click "Play" to run the visualization automatically, "Pause" to pause the automatic visualization, "Step Forward" to step forward one step at any time, or "Step Backward" to step backward one step at any time.
Expected Result	1. The currently visiting edges and nodes will be highlighted red in each step, with the visited nodes and edges turning black. Unvisited nodes/edges will remain gray. 2. The algorithm performs a depth-first traversal on the graph, visiting each node connected to the start node. (Target node "search" functionality could be added later)

Name	TC-7 Breadth First Search
Requirement	FR10
Preconditions	Must have a graph created
Steps	1. Click on the drop down menu under "Select Algorithm" 2. Pick Breadth First Search. 3. Hit "Run Algorithm" 4. Select a starting node on the graph to indicate where the path will begin. 5. Select the target node to find on the graph. 6. The algorithm will highlight each node and edge as it traverses through the steps of the breadth first search traversal. 7. Click "Play" to run the visualization automatically, "Pause" to pause the automatic visualization, "Step

	Forward" to step forward one step at any time, or "Step Backward" to step backward one step at any time.
Expected Result	1. The currently visiting edges and nodes will be highlighted red in each step, with the visited nodes and edges turning black. Unvisited nodes/edges will remain gray. 2. The algorithm performs a breadth first traversal on the graph, visiting each node connected to the start node. (Target node "search" functionality could be added later)

Name	TC-8 Step Forward through algorithm
Requirement	FR11
Preconditions	Algorithm must be currently running.
Steps	1. Step forward to the next state in the visualization by clicking "Step Forward".
Expected Result	1. Graph will show the visualization of the next step in the currently running algorithm.

Name	TC-9 Step backward through algorithm
Requirement	FR12
Preconditions	An algorithm visualization is currently running.
Steps	1. While algorithm is still running, hit "Step Backward" to move back one step in the visualization.
Expected Result	1. Graph will show the visualization of the previous step in the currently running algorithm.

Name	TC-10 Cancel running an algorithm
Requirement	FR13
Preconditions	An algorithm visualization is currently running.
Steps	1. Click any of the left-hand size buttons (Add Nodes, Add Edges, etc…) to cancel running an algorithm.
Expected Result	1. The algorithm will stop running, and the user can edit their graph or run a new algorithm.

Name	TC-11 Run algorithm visualization automatically
Requirement	FR14
Preconditions	Must have selected an algorithm to run and clicked "Run Algorithm".
Steps	1. Press "Play" after starting an algorithm for automatic visualization of the algorithm. 2. To pause the automatic visualization, press "Pause". You can resume at any time, or elect to step forward/backward at any time.
Expected Result	1. Algorithm will run to the end, highlighting currently visiting nodes/edges red, turning previously visited nodes/edges black, while unvisited nodes/edges remain gray. A short amount of time separates the visualizing of each step so the user has a chance to see what is happening. 2. If paused, the visualization will halt at the current state until "Play" is hit again or the user steps forward/backward.