

## <Project1>: Shopping Cart Checkout Simulation Black Box Test Plan

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### Introduction:

The purpose of this proposed black box test plan is to ensure that proper functionality is achieved, constantly, through various repeatable testing conditions. Since the simulation uses a randomly generated value as part of its calculation for a cart's arrival and checkout time, the [SimulationViewer.java](#) class cannot be tested for consistency. However, The [SimpleSimulationRunner.java](#) class can be substituted in place for the main program, and used to test for required functionality, with constant and repeatable testing parameters. Although the main program lacks consistency when reporting average wait and checkout times, which it's designed to do, it is still tested to ensure proper functionality of the graphical user interface.

Basic instructions for running both the [SimpleSimulationRunner.java](#) and [SimulationViewer.java](#) files are provided inside the **Description** column below. Additionally, basic understanding of the Eclipse IDE is assumed.

### File Names and Directory Locations:

**File:** SimpleSimulationRunner.java      **Package Explorer:** Project1 > src > ui > SimpleSimulationRunner.java  
**File:** SimulationViewer.java      **Package Explorer:** Project1 > src > ui > SimulationViewer.java

### How to Run:

1. Expand the Package Explorer to display the above source directory.
2. Right click on the specified test file.
3. Click Run as
4. Select Java Application

Test ID	Description	Expected Results	Actual Results
Test 1: Test Invalid Register Input	<p>Preconditions: None</p> <p>Run Simulation Viewer.java</p> <p>Right click on <b>SimpleSimulationRunner.java</b> in Eclipse by expanding any necessary folders: <i>Project1/src/ui/SimpleSimulationRunner.java</i></p> <p>Click: Run as Select: Java Application</p> <p>The console, located on the bottom part of Eclipse (depending on your settings) should ask for input: <b>Number of carts:</b></p> <p>Type: 20</p> <p>Hit the Enter/Return key.</p>	<p>The console displays:</p> <p>Number of shopping carts: 20</p> <p>Number of checkout registers: 2</p> <p>Exception in thread "main"</p> <p><a href="#">java.lang.IllegalArgumentException: Number of registers must be between 3 and 12 inclusive.</a></p> <p>at edu.ncsu.csc216.checkout_simulator.simulation.Simulator.&lt;init&gt;(<a href="#">Simulator.java:44</a>)</p> <p>at edu.ncsu.csc216.checkout_simulator.ui.SimpleSimulationRunner.main(<a href="#">SimpleSimulationRunner.java:24</a>)</p>	<p>The console displays:</p> <p>Number of shopping carts: 20</p> <p>Number of checkout registers: 2</p> <p>Exception in thread "main"</p> <p><a href="#">java.lang.IllegalArgumentException: Number of registers must be between 3 and 12 inclusive.</a></p> <p>at edu.ncsu.csc216.checkout_simulator.simulation.Simulator.&lt;init&gt;(<a href="#">Simulator.java:44</a>)</p> <p>at edu.ncsu.csc216.checkout_simulator.ui.SimpleSimulationRunner.main(<a href="#">SimpleSimulationRunner.java:24</a>)</p>

	<p>Console should now say: <b>Number of checkout registers:</b></p> <p>Type: 2</p> <p>Hit the Enter/Return key.</p> <p>Check results.</p>		
<p>Test 2: Test Invalid Inputs</p>	<p>Preconditions: none</p> <p>Run the SimpleSimulationRunner.java (refer back to Test 1 for help).</p> <p>Enter -2 as the input for "Number of carts:"</p> <p>Hit Enter/Return</p> <p>Enter 9 as the input for "Number of checkout registers:"</p> <p>Hit Enter/Return</p> <p>Check Results</p>	<p>The console displays:</p> <p>Exception in thread "main"  <a href="#">java.lang.IllegalArgumentException</a>: There must be at least one shopping cart in the simulation.  at edu.ncsu.csc216.checkout_simulator.simulation.Simulator.&lt;init&gt;(Simulator.java:45)  at edu.ncsu.csc216.checkout_simulator.ui.SimpleSimulatorRunner.main(SimpleSimulatorRunner.java:24)</p>	<p>The console displays:</p> <p>Exception in thread "main"  <a href="#">java.lang.IllegalArgumentException</a>: There must be at least one shopping cart in the simulation.  at edu.ncsu.csc216.checkout_simulator.simulation.Simulator.&lt;init&gt;(Simulator.java:45)  at edu.ncsu.csc216.checkout_simulator.ui.SimpleSimulatorRunner.main(SimpleSimulatorRunner.java:24)</p>
<p>Test 3: Test Valid Parameters</p>	<p>Preconditions: None</p> <p>Run SimpleSimulationViewer.java (refer back to Test 1 for help).</p> <p>Enter 20 as the input for "Number of carts:"</p> <p>Hit Enter/Return</p> <p>Enter 6 as the input for "Number of checkout registers:"</p> <p>Hit Enter/Return</p> <p>Check Results</p> <p>Repeat Test 3 to ensure you get the same results as your first run.</p> <p>Check Results</p>	<p>The simulation ran without any errors and the console displays:</p> <p>Number of shopping carts: 20  Number of checkout registers: 6  Average Wait Time: 124.000 seconds  Average Process Time: 167.400 seconds.</p> <p>Same results were achieved.</p>	<p>The simulation ran without any errors and the console displays:</p> <p>Number of shopping carts: 20  Number of checkout registers: 6  Average Wait Time: 124.000 seconds  Average Process Time: 167.400 seconds.</p> <p>Same results were achieved.</p>

Test 4: Starting The Application	<p>Preconditions: None</p> <p>Run Simulation Viewer.java</p> <p>Right click on <b>SimulationViewer.java</b> in Eclipse by expanding any necessary folders in the Project Explorer: <i>Project1/src/ui/Simulation Viewer.java</i></p> <p>Click: Run as Select: Java Application</p> <p>Check Results</p>	<p>Title bar says "Shopping Cart Checkout Simulation" with two buttons underneath: Start Stop</p> <p>The simulation is blank with a legend underneath displaying:</p> <p>Green - Express Cart Blue - Regular Cart Red - Special Handling Cart</p> <p>The number of shopping carts is prefilled to a value of 100, the number of checkout registers is pre-selected to a value of 3, both average checkout time and average wait time show no values next to them, the progress bar displays no progress and is completely grey.</p>	<p>Title bar says "Shopping Cart Checkout Simulation" with two buttons underneath: Start Stop</p> <p>The simulation is blank with a legend underneath displaying:</p> <p>Green - Express Cart Blue - Regular Cart Red - Special Handling Cart</p> <p>The number of shopping carts is prefilled to a value of 100, the number of checkout registers is pre-selected to a value of 3, both average checkout time and average wait time show no values next to them, the progress bar displays no progress and is completely grey.</p>
Test 5: Testing GUI with Invalid Input	<p>Preconditions: Test 4 passed.</p> <p>Enter -1 inside the text field beside the label "Number of Shopping Carts:"</p> <p>Leave all other values to their pre-filled/pre-selected values.</p> <p>Click start.</p> <p>Check Results:</p> <p>Click OK</p>	<p>A pop-up dialog box displays the message: "There must be at least one shopping cart in the simulation."</p> <p>The animation did not run, the labels and input values did not change, the progress bar did not change, and no values are listed beside the labels for both "Average Wait Time:" and "Average Checkout Time:"</p>	<p>A pop-up dialog box displays the message: "There must be at least one shopping cart in the simulation."</p> <p>The animation did not run, the labels and input values did not change, the progress bar did not change, and no values are listed beside the labels for both "Average Wait Time:" and "Average Checkout Time:"</p>
Test 6: Testing GUI with Valid Input	<p>Preconditions: Test 4 passed.</p> <p>Enter 100 inside the text field beside the label "Number of Shopping Carts:"</p> <p>Select 9 as the "Number of Checkout Registers."</p>	<p>The simulation ran without any errors.</p> <p>The animation displayed 9 columns with colored squares of varying amounts and colors (Green, Blue, Red), the progress bar moved along with the animation.</p>	<p>The simulation ran without any errors.</p> <p>The animation displayed 9 columns with colored squares of varying amounts and colors (Green, Blue, Red), the progress bar moved along with the animation.</p>

	<p>Leave all other values to their default and click "Start"</p> <p>Check Results</p>	<p>There are numbers listed beside both "Average Wait Time" and "Average Checkout Time" labels.</p>	<p>There are numbers listed beside both "Average Wait Time" and "Average Checkout Time" labels.</p>
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#### Document Revision History

Date	Author	Change Description
3/3/2017	Steven Mayo	<ul style="list-style-type: none"> <li>Created and filled out BBTP for P1P2. I was unaware that this was required for P1P1. I thought the separated sections on the website correlated to different parts of the project.</li> </ul>