

McMASTER UNIVERSITY

CAS 4ZP6

TEAM 9

CAPSTONE PROJECT 2013/2014

PORTER SIMULATION

Test Report Revision 0

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1 REVISION HISTORY

Revision #	Author	Date	Comment
1	Nathan Johrendt	March 17	Test Report Template Complete

2 INTRODUCTION

3 SYSTEM TEST REPORTS

3.1 INPUT/INITIALIZATION CORRECTNESS 1

Once input values are loaded by the simulation, it has become initialized with modified values. Before beginning simulation, the simulation will re-print the information it just imported to confirm that it has found the right information.

- (i) **Initial State:** Uninitialized Simulation
- (ii) **Input:** Simulation input variables from interface, as well as a file location for both data.csv and schedule.csv for importing job data and porter shift information respectively.
- (iii) **Expected Output:** Simulation outputs variable data identical to that defined by the interface.
- (iv) **Actual Output:**

3.2 EVENT LIST CORRECTNESS 1

As the simulation runs, when an event is dispatched to a porter, it will then have fewer jobs left to assign. With 30 porters on a 24 hour schedule, no jobs will remain undone, and any that remain will represent an error to examine.

- (i) **Initial State:** Simulation event list is generated by initializing the simulation through the interface
- (ii) **Input:** Event list is generated from jobs stored in the data.csv file. The simulation will be configured to add jobs for one day, with 30 porters scheduled 24 hours a day.
- (iii) **Expected Output:** Conclude that no incomplete jobs remain
- (iv) **Actual Output:**

3.3 STATE CHANGE CORRECTNESS 1

With only five Porters working, they will be required to change state frequently as they complete all of a regular day's tasks understaffed. Any problems, beyond the obvious delays, will result in a Porter getting stuck with a job at a particular state. This will be recorded in the output data and can be addressed.

- (i) **Initial State:** Simulation event list is generated by initializing the simulation through the interface
- (ii) **Input:** Event list is generated from jobs stored in the data.csv file. Porter schedule is generated from the schedule.csv file. The simulation will be configured to add jobs for one day, with five porters scheduled 24 hours a day.
- (iii) **Expected Output:** All Porters complete jobs dispatched to them successfully
- (iv) **Actual Output:**

3.4 PORTER/EVENT LINKAGE CORRECTNESS 1

Every time an Event moves from pending to dispatched, a Porter must be linked to that event. This test is to ensure that all pairings of job and Porter are unique, and that after completing a job, a porter will return to "available" and continue accepting new jobs.

- (i) **Initial State:** Simulation event list and porter schedule are generated by initializing the simulation through the interface
- (ii) **Input:** Event list is generated from jobs stored in the data.csv file. Porter schedule is generated from the schedule.csv file. The simulation will be configured to add jobs for one day, with 30 porters scheduled 24 hours a day.
- (iii) **Expected Output:** Porter and Event are linked together uniquely
- (iv) **Actual Output:**

3.5 TASK POOL CORRECTNESS 1

With only a single porter active, the majority of the jobs added by the simulation will simply be added to the dispatcher and wait. This test is to ensure that the dispatcher holds incomplete jobs correctly and that they are reported after the simulation completes.

- (i) **Initial State:** Simulation event list and porter schedule are generated by initializing the simulation through the interface
- (ii) **Input:** Event list is generated from jobs stored in the data.csv file. Porter schedule is generated from the schedule.csv file. The simulation will be configured to add jobs for one day, with one Porter scheduled 24 hours a day.
- (iii) **Expected Output:** Simulation output properly stores many incomplete job entries.
- (iv) **Actual Output:**

3.6 TERMINATION CORRECTNESS 1

After accepting all inputs and initializing, the simulation will compute five days of operational data and output the results.

- (i) **Initial State:** Simulation is initialized through the interface
- (ii) **Input:** Event list is generated from jobs stored in the data.csv file. Porter schedule is generated from the schedule.csv file. The simulation will be configured to add jobs for five days, with 30 porters scheduled 24 hours a day.
- (iii) **Expected Output:** Simulation outputs that it has completed each step and has written the results to the dashboard.
- (iv) **Actual Output:**

3.7 THE GOLDEN TEST

Using a 'gold copy' of a set of events and Porter shifts, new program builds are retested using the 'gold copies' to ensure consistency of execution by examining inconsistencies in the output file. This specific set of events is maintained and retested on new revisions of the software. A difference file can then be created in excel comparing 'gold copy' statistics against the newly tested code outlining the inconsistencies between them. The maximum variance allowed in the results is still being determined.

- (i) **Initial State:** Simulation is initialized through the interface
- (ii) **Input:** 'Gold Copy' set of events imported from golddata.csv, as well as Porter shift information from goldschedule.csv
- (iii) **Expected Output:** Simulation outputs that it has completed each step and has written the results to the dashboard.
- (iv) **Actual Output:**

3.8 COMPATIBILITY TEST 1

Simulation is run and compared to results computed on other operating systems to ensure it is functioning normally in the new environment

- (i) **Initial State:** Unknown Operating System with the simulation accessible on local storage
- (ii) **Input:** 'Gold Copy' simulation parameters (details outline previously under 'The Golden Test')
- (iii) **Expected Output:** Simulated results are consistent with previously generated values
- (iv) **Actual Output:**

4 NONFUNCTIONAL TEST REPORTS

4.1 USABILITY TEST 1

End user is provided with a set of instructions from the user manual on how to initialize and run the simulation. The success of this test is determined by how much external assistance the End User requires from the development team on their first use of the software.

- (i) **Initial State:** Simulation prior to execution
- (ii) **Input:** End user with a copy of both the simulation software package and accompanying user manual.
- (iii) **Expected Output:** The end user successfully Initializes the Simulation
- (iv) **Actual Output:**

4.2 PERFORMANCE TEST 1

The project stakeholders have placed a loose time limit on the duration of execution for a single simulation run of fifteen minutes. No correct simulation execution has taken longer than five minutes, with most between one and two minutes, but ensuring this general timing on each system the simulation is run on is the purpose of this test.

- (i) **Initial State:** Simulation prior to execution
- (ii) **Input:** Any combination of inputs that the interface will accept and begin simulating
- (iii) **Expected Output:** The simulation completes execution taking between thirty seconds and five minutes
- (iv) **Actual Output:**

5 SUMMARY

6 FIGURES AND TABLES APPENDIX

- (a) Figure 3.1: