Test Plan

Rev 2.0

4/10/18

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| --- | --- | --- |
| Date | Change | Changes made by |
| 3/20/18 | Document created | Matthew Michaels, Reagan Craddock, Milton Griffin, Michael Farden, Matthew Strenk |
| 3/29/18 | Document completed | Matthew Michaels, Reagan Craddock, Michael Farden, Matthew Strenk |
| 4/10/18 | Document updated with test results and some tweaks | Matthew Michaels, Reagan Craddock, Michael Farden, Matthew Strenk |

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# **Overview**

The objective of this project is to design a program that simulates both cache memory and scratchpad memory within the same application. Another goal of this design is to be able to give the user statistics about the simulation, so that the performance of cache memory and scratchpad memory can be compared. The last goal of this design is that it is multi core meaning that it is able to utilize two system cores at the same time improve performance.

# **What Will Be Tested**

This test plan is designed to exercise the features of the Multicore Scratchpad and Cache Simulator that are designed and implemented during the design plan. The memory simulator itself is open source software and was verified by the creator that it is working properly, so no testing is needed on this piece of the software. What will be tested is the wrapper that will encompass the memory simulator. The wrapper will be created in Python and will be in charge of gather and verifying user input, simultaneously calling two iterations of the memory simulator in two different cores in order to run a cache and scratchpad memory simulation at the same time, and for displaying results back to the user after the tests have been run. A list of testable software components are as follows:

1. User inputted simulation selection
2. Verification of user input
3. Multi-core simulation
4. Return of simulation results

# **Test Plans**

## Simulation Type Selection Test

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test Writer:** Matthew Michaels | | | | | | | |
| **Test Case Name:** | | Simulation Type Selection Test | | | | **Test ID #:** | P1-STS1 |
| **Description:** | | This test verifies that the user has the ability to choose between the multiple simulation types | | | | **Type:** | Black Box |
| **Dependencies:** | | None | | | | | |
| **Tester Information** | | | | | | | |
| **Name of Tester:** | | Matthew Michaels | | | | **Date:** | 4/10/18 |
| **Software Ver:** | | 1.0.0 | | | | **Time:** | 1:20 PM |
| **Setup:** | | Python wrapper script is running and ready to accept user input | | | | | |
| **Step** | **Action** | **Expected Result** | **Pass** | **Fail** | **N/A** | **Comments** | |
| 1 | Enter in 1, 2, 3, or 4 | The command window should tell you what kind of simulation you are now running | x |  |  |  | |
| 2 | Wait for program to end, or simulation to finish | Program either finishes the simulation, returns the results, and prompts user for a new simulation or will exit | x |  |  |  | |
| 3 | Relaunch script if necessary | Script reopens or skip this step if not necessary | x |  |  |  | |
| 4 | Repeat steps 1 through 3 again, but chose a different number from 1, 2, 3, or 4 every time until you’ve used each number once. | See results for 1-3. Assuming all possible input values give the expect results, the simulation selection is working properly. | x |  |  |  | |
| **Overall test result:** | | | x |  |  |  | |

## Verification of User Input Test

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test Writer:** Michael Farden | | | | | | | |
| **Test Case Name:** | | Verification of User Input Test | | | | **Test ID #:** | P1-VUI1 |
| **Description:** | | This test verifies that the user input is valid | | | | **Type:** | Black Box |
| **Dependencies:** | | Test P1-STS1 | | | | | |
| **Tester Information** | | | | | | | |
| **Name of Tester:** | | Michael Farden | | | | **Date:** | 4/10/18 |
| **Software Ver:** | | 1.0.0 | | | | **Time:** | 1:20 PM |
| **Setup:** | | Python wrapper script is running and ready to accept user input | | | | | |
| **Step** | **Action** | **Expected Result** | **Pass** | **Fail** | **N/A** | **Comments** | |
| 1 | Enter 1, 2, 3, or 4 | The program runs the simulation corresponding to the entered option. | x |  |  |  | |
| 2 | Enter a character other than “1, 2, 3, or 4” | The program displays a message stating that the user did not enter a valid option. The program then prompts the user to try again. | x |  |  |  | |
| **Overall test result:** | | | x |  |  |  | |

## Multi-Thread Test

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test Writer:** Reagan Craddock | | | | | | | |
| **Test Case Name:** | | Multi-thread test | | | | **Test ID #:** | P1-MT1 |
| **Description:** | | This test verifies whether or not the processes are split between cores | | | | **Type:** | Black Box |
| **Dependencies:** | | 3.1, 3.2 | | | |  |  |
| **Tester Information** | | | | | | | |
| **Name of Tester:** | | Reagan Craddock | | | | **Date:** | 4/10/18 |
| **Software Ver:** | | 1.0.0 | | | | **Time:** |  |
| **Setup:** | | Simulator is called from .bat file with set CPU affinities | | | | | |
| **Step** | **Action** | **Expected Result** | **Pass** | **Fail** | **N/A** | **Comments** | |
| 1 | Pass input from .py script to .bat file | The .py passes inputs successfully | x |  |  |  | |
| 2 | The simulator runs the correct simulation without error | The simulator does not log any error message | x |  |  |  | |
| 3 | The simulator runs on CPU0 and CPU2 | The load on CPU0 and CPU2 in Window’s Resource Manager shows similar activity on each thread | x |  |  |  | |
| **Overall test result:** | | |  |  |  |  | |

## Return Results Test

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test Writer:** Matthew Strenk | | | | | | | |
| **Test Case Name:** | | Returns Results Test | | | | **Test ID #:** | P1-RR1 |
| **Description:** | | This test verifies that results are returned when the user runs the program | | | | **Type:** | Black Box |
| **Dependencies:** | | Test P1-STS1 | | | |  |  |
| **Tester Information** | | | | | | | |
| **Name of Tester:** | | Matthew Strenk | | | | **Date:** | 4/10/18 |
| **Software Ver:** | | 1.0.0 | | | | **Time:** | 1:10 PM |
| **Setup:** | | Python wrapper script is running. | | | | | |
| **Step** | **Action** | **Expected Result** | **Pass** | **Fail** | **N/A** | **Comments** | |
| 1 | Input ‘1’ when prompted and wait for program to finish running. | Outputs expected output for a hash benchmark. | x |  |  |  | |
| 2 | Restart program. Input ‘2’ when prompted and wait for program to finish running. | Outputs expected output for a heap benchmark. | x |  |  |  | |
| 3 | Restart program. Input ‘3’ when prompted and wait for program to finish running. | Outputs expected output for a stride benchmark. | x |  |  |  | |
| 4 | Restart program. Input ‘4’ when prompted and wait for program to finish running. | Outputs expected output for a trace benchmark. | x |  |  |  | |
| **Overall test result:** | | | x |  |  |  | |