CS 1632 Software Quality Assurance

Deliverable 4

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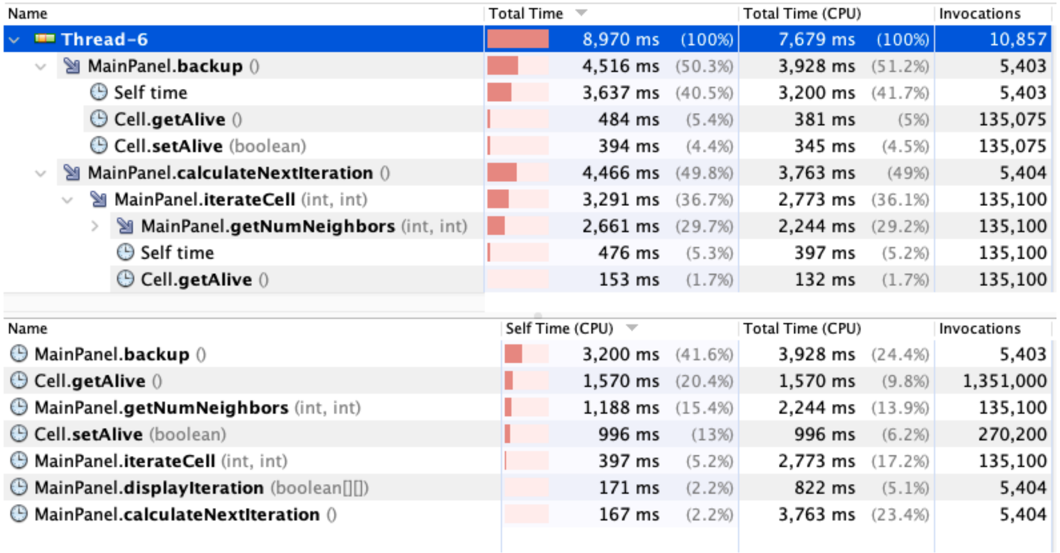
1. **Optimized Feature 1**
    a. Write the name of the feature optimized (the label on the button)
    Run Continuous

    b. Write the name(s) of the method(s) you refactored to optimize this feature
    iterateCell
    calculateNextIteration

    c. Insert a screenshot of VisualVM CPU profiling ***after*** optimizing Feature 1. Please include only the “Hot spots” window in the screenshot.



Name	Total Time		Total Time (CPU)		Invocations
Thread-6	8,970 ms	(100%)	7,679 ms	(100%)	10,857
MainPanel.backup ()	4,516 ms	(50.3%)	3,928 ms	(51.2%)	5,403
Self time	3,637 ms	(40.5%)	3,200 ms	(41.7%)	5,403
Cell.getAlive ()	484 ms	(5.4%)	381 ms	(5%)	135,075
Cell.setAlive (boolean)	394 ms	(4.4%)	345 ms	(4.5%)	135,075
MainPanel.calculateNextIteration ()	4,466 ms	(49.8%)	3,763 ms	(49%)	5,404
MainPanel.iterateCell (int, int)	3,291 ms	(36.7%)	2,773 ms	(36.1%)	135,100
MainPanel.getNumNeighbors (int, int)	2,661 ms	(29.7%)	2,244 ms	(29.2%)	135,100
Self time	476 ms	(5.3%)	397 ms	(5.2%)	135,100
Cell.getAlive ()	153 ms	(1.7%)	132 ms	(1.7%)	135,100

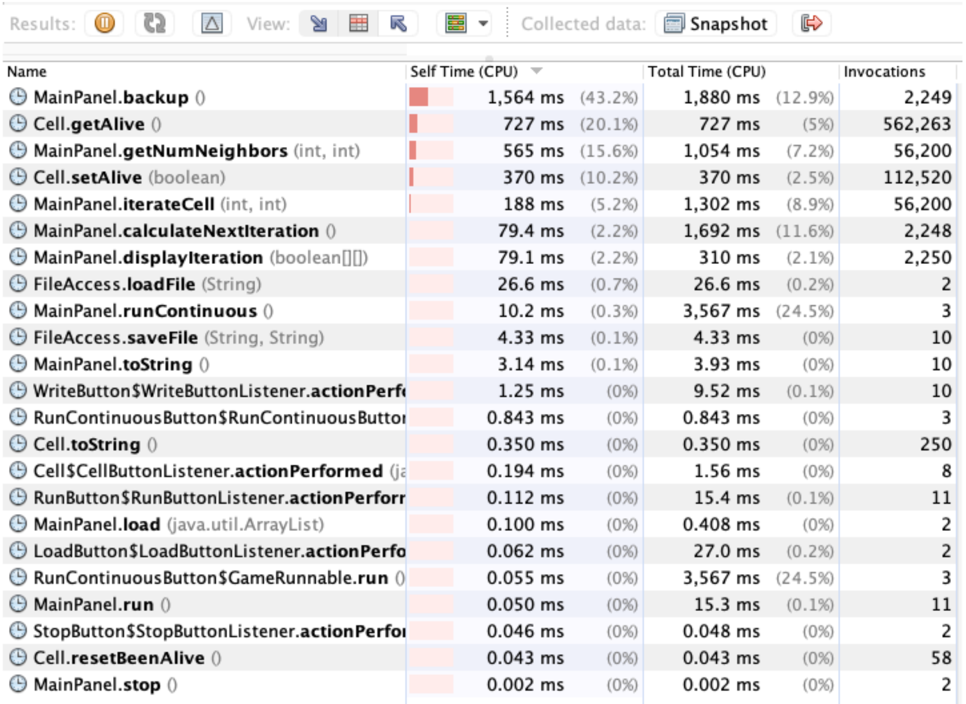
Name	Self Time (CPU)		Total Time (CPU)		Invocations
MainPanel.backup ()	3,200 ms	(41.6%)	3,928 ms	(24.4%)	5,403
Cell.getAlive ()	1,570 ms	(20.4%)	1,570 ms	(9.8%)	1,351,000
MainPanel.getNumNeighbors (int, int)	1,188 ms	(15.4%)	2,244 ms	(13.9%)	135,100
Cell.setAlive (boolean)	996 ms	(13%)	996 ms	(6.2%)	270,200
MainPanel.iterateCell (int, int)	397 ms	(5.2%)	2,773 ms	(17.2%)	135,100
MainPanel.displayIteration (boolean[][])	171 ms	(2.2%)	822 ms	(5.1%)	5,404
MainPanel.calculateNextIteration ()	167 ms	(2.2%)	3,763 ms	(23.4%)	5,404

2. **Optimized Feature 2**

   a. Write the name of the feature optimized (the label on the button)
   write

   b. Write the name(s) of the method(s) you refactored to optimize this feature
   toString in Cell.java

   c. Insert a screenshot of VisualVM CPU profiling ***after*** optimizing Feature 2. Please show only the profile for Feature 2 (do not invoke Feature 1 while profiling). Please include only the “Hot spots” window in the screenshot, as before.



Name	Self Time (CPU)		Total Time (CPU)		Invocations
MainPanel.**backup** ()	1,564 ms	(43.2%)	1,880 ms	(12.9%)	2,249
Cell.**getAlive** ()	727 ms	(20.1%)	727 ms	(5%)	562,263
MainPanel.**getNumNeighbors** (int, int)	565 ms	(15.6%)	1,054 ms	(7.2%)	56,200
Cell.**setAlive** (boolean)	370 ms	(10.2%)	370 ms	(2.5%)	112,520
MainPanel.**iterateCell** (int, int)	188 ms	(5.2%)	1,302 ms	(8.9%)	56,200
MainPanel.**calculateNextIteration** ()	79.4 ms	(2.2%)	1,692 ms	(11.6%)	2,248
MainPanel.**displayIteration** (boolean[][])	79.1 ms	(2.2%)	310 ms	(2.1%)	2,250
FileAccess.**loadFile** (String)	26.6 ms	(0.7%)	26.6 ms	(0.2%)	2
MainPanel.**runContinuous** ()	10.2 ms	(0.3%)	3,567 ms	(24.5%)	3
FileAccess.**saveFile** (String, String)	4.33 ms	(0.1%)	4.33 ms	(0%)	10
MainPanel.**toString** ()	3.14 ms	(0.1%)	3.93 ms	(0%)	10
WriteButton$WriteButtonListener.**actionPerf**	1.25 ms	(0%)	9.52 ms	(0.1%)	10
RunContinuousButton$RunContinuousButto	0.843 ms	(0%)	0.843 ms	(0%)	3
Cell.**toString** ()	0.350 ms	(0%)	0.350 ms	(0%)	250
Cell$CellButtonListener.**actionPerformed** (j	0.194 ms	(0%)	1.56 ms	(0%)	8
RunButton$RunButtonListener.**actionPerfor**	0.112 ms	(0%)	15.4 ms	(0.1%)	11
MainPanel.**load** (java.util.ArrayList)	0.100 ms	(0%)	0.408 ms	(0%)	2
LoadButton$LoadButtonListener.**actionPerfo**	0.062 ms	(0%)	27.0 ms	(0.2%)	2
RunContinuousButton$GameRunnable.**run** ()	0.055 ms	(0%)	3,567 ms	(24.5%)	3
MainPanel.**run** ()	0.050 ms	(0%)	15.3 ms	(0.1%)	11
StopButton$StopButtonListener.**actionPerfo**	0.046 ms	(0%)	0.048 ms	(0%)	2
Cell.**resetBeenAlive** ()	0.043 ms	(0%)	0.043 ms	(0%)	58
MainPanel.**stop** ()	0.002 ms	(0%)	0.002 ms	(0%)	2