

Task 1 Report: Observed Behavior When Using Volatile Key Word versus Not Using Volatile Key Word

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Tests- For the following tests (1,2,3), I used sample inputs from the HW2 pdf assignment. I only recorded the output for task 1 for the sake of clarity of what I am looking at. Other tasks (2,3) output will be recorded in their respective task reports.

Input format:(<size>,<experiments>,<seed>)

Test 1:

Test 1 inputs:	Test 1 outputs:
25000000 1 42	Task 1 Regular: 0.08382 seconds Volatile: 0.34317 seconds Avg regular sum: -12500000 Avg volatile sum: -12500000

Test 2:

Test 2 inputs:	Test 2 outputs:
25000000 20 42	Task 1 Regular: 0.09324 seconds Volatile: 0.55551 seconds Avg regular sum: -12500000 Avg volatile sum: -12500000

Test 3:

Test 3 inputs:	Test 3 outputs:
25000000 200 42	Task 1 Regular: 0.03450 seconds Volatile: 0.16383 seconds Avg regular sum: -12500000 Avg volatile sum: -12500000

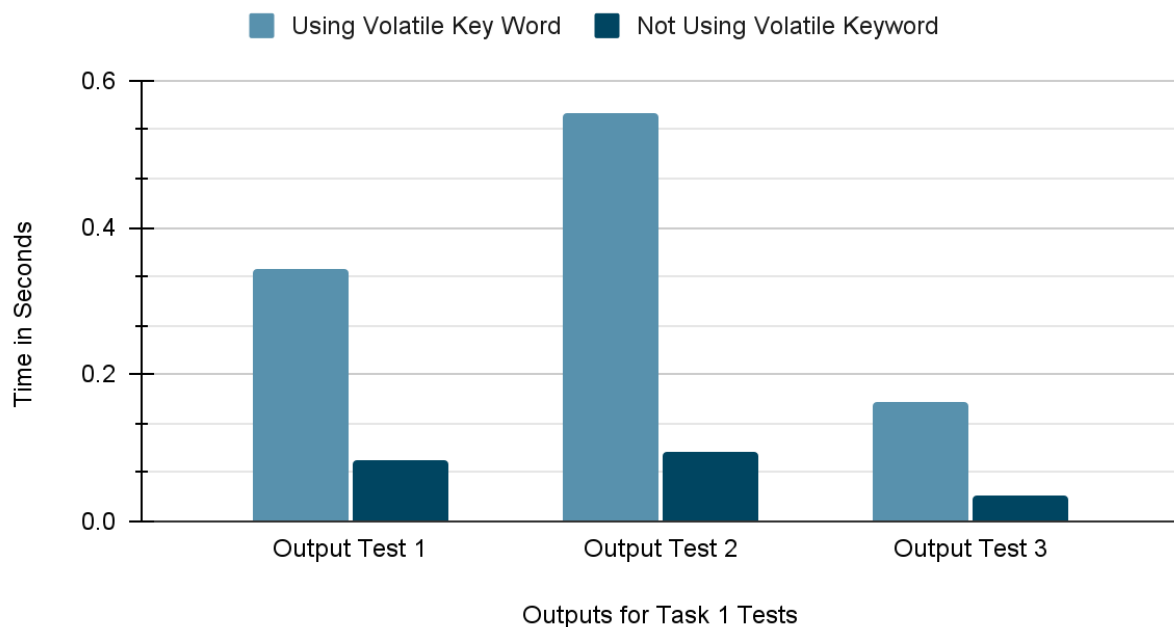
Observations:

1. Only one input is changed throughout the tests. The independent variable is the number of experiments performed. The size and seed stayed constant throughout the tests. The dependent variables were the time it took to complete Task 1 while using the volatile keyword and the time it took to complete Task 1 while not using the volatile keyword.
2. When running my tests with Test 1 inputs (25000000 1 42) the time to complete Task 1 using the volatile keyword took approximately 4.09 times as long as the time complete Task 1 without using the volatile keyword.
3. When running my tests with Test 2 inputs (25000000 20 42) the time to complete Task 1 using the volatile keyword took approximately 5.957 times as long as the time to complete Task 1 without using the volatile keyword.

4. When running my tests Test 3 inputs (25000000 200 42) the times to complete Task 1 using the volatile keyword took approximately 7.478 times as long as the time to complete Task 1 without using the volatile keyword.
5. When digesting this information I noticed that the bigger the input for the number of experiments (the only variable in these tests, the middle input) the larger the difference in time became between using the volatile keyword and not using it. E.g., Test 1: 4.09 times as long, Test 2: 5.957 times as long, Test 3: 7.478 times as long.
6. When running my final test, Test 3, I noticed that my console took a lot longer to load the results than in previous tests. My inference is that this is because there were a lot more experiments in that test than in the previous test.

Below, I've outlined the results from my experiments for Task 1 in a bar graph.

Use of Volatile Key Word in Task 1



Conclusions:

From my experiments, it can be concluded that using the volatile keyword significantly increases the amount of time it takes to complete Task 1. It should be noted that in Test 3, the outputs came slowly but the test result output seem to actually be slightly faster than the previous tests. This might be something to explore.