INDIAN INSTITUTE OF TECHNOLOGY GOA

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[Running] cd "d:\LECS AND MATERIAL\SEMESTER 4\Algorithm Design\Assignment1\" && g++ mergesort_21031_11.cpp -o mergesort_21(
4\Algorithm Design\Assignment1\"mergesort_21031_11
41 18467
Time taken by the Merge Sort procedure for sorting and returning the output of the given array is: 63200 nanoseconds
(1,2,63200ns,2,31600ns)
6334 15724 19169 26500
Time taken by the Merge Sort procedure for sorting and returning the output of the given array is: 4900 nanoseconds
(2,4,4900ns,8,612ns)
5705 11478 16827 23281 24464 26962 28145 29358
Time taken by the Merge Sort procedure for sorting and returning the output of the given array is: 5600 nanoseconds
(3,8,5600ns,24,233ns)
Expected Value of the Ci's is: 10815 nanoseconds
Variance of the Ci's is: 216032052 nanoseconds

[Done] exited with code=0 in 3.137 seconds
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Q1: Test case 1: k = 3

Q1: Test case 2: k =5

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[Running] cd "d:\LECS AND MATERIAL\SEMESTER 4\Algorithm Design\Assignment1\" && g++ mergesort_21031_11.cpp -o mergesort_21031_11 && "d:\LECS AND MATERIAL\SEMESTER
4\Algorithm Design\Assignment1\"mergesort_21031_11
41 18467
Time taken by the Merge Sort procedure for sorting and returning the output of the given array is: 32900 nanoseconds
(1,2,32900ns,2,16450ns)
6334 15724 19169 26500
Time taken by the Merge Sort procedure for sorting and returning the output of the given array is: 2300 nanoseconds
(2,4,2300ns,8,287ns)
5705 11478 16827 23281 24464 26962 28145 29358
Time taken by the Merge Sort procedure for sorting and returning the output of the given array is: 2700 nanoseconds
(3,8,2700ns,24,112ns)
153 292 491 2995 3902 4827 5436 9961 11942 12382 14604 17421 18716 19718 19895 32391
Time taken by the Merge Sort procedure for sorting and returning the output of the given array is: 3600 nanoseconds
(4,16,3600ns,64,56ns)
778 1869 3035 4664 5447 6868 7711 8723 9741 9894 11538 12316 12859 14771 15141 17035 17673 19912 20037 21726 23811 25547 25667 26299 27529 27644 28253 28703 30333 31322
32662 32757
Time taken by the Merge Sort procedure for sorting and returning the output of the given array is: 5800 nanoseconds
(5,32,5800ns,160,36ns)
Expected Value of the Ci's is: 3388 nanoseconds
Variance of the Ci's is: 42660469 nanoseconds

[Done] exited with code=0 in 2.908 seconds
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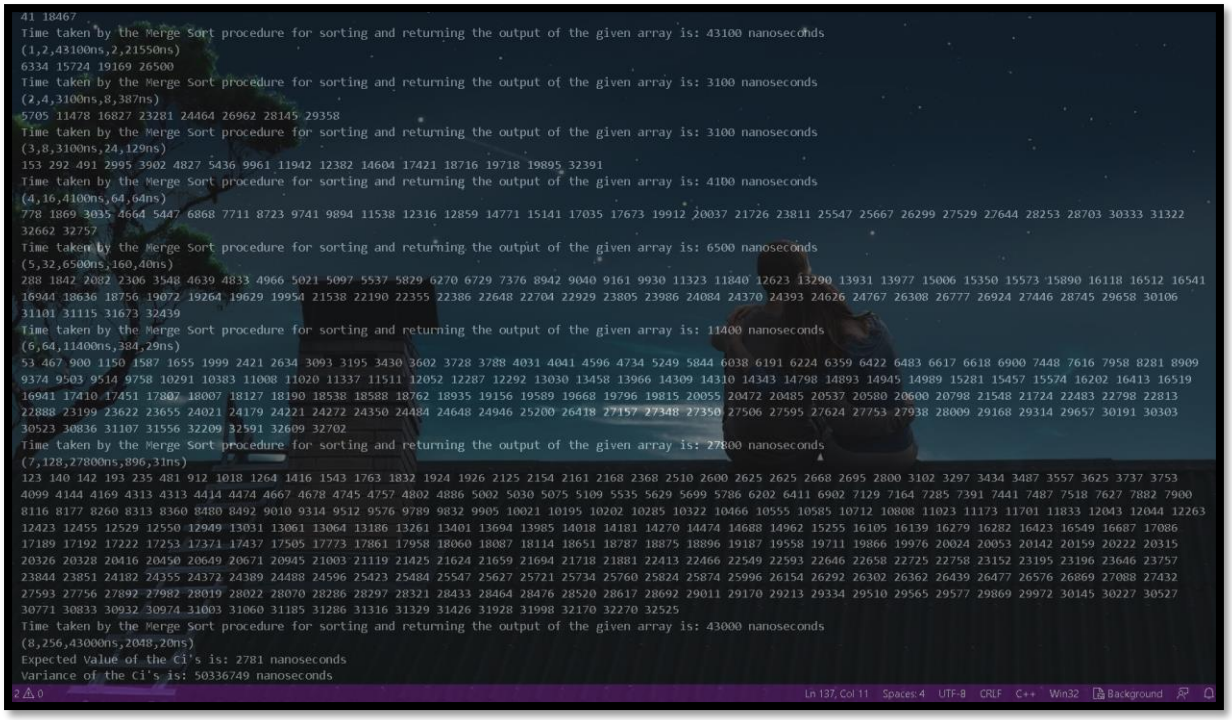
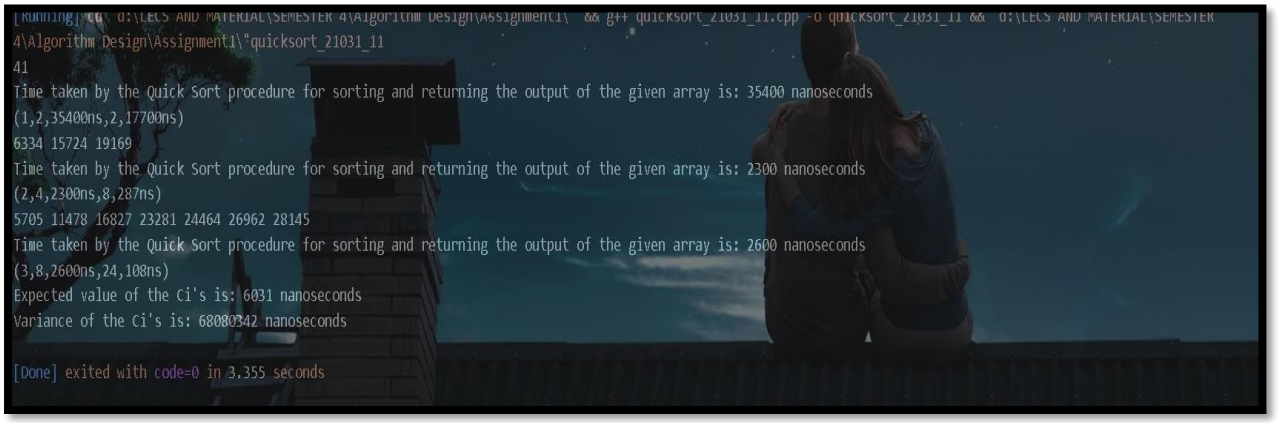
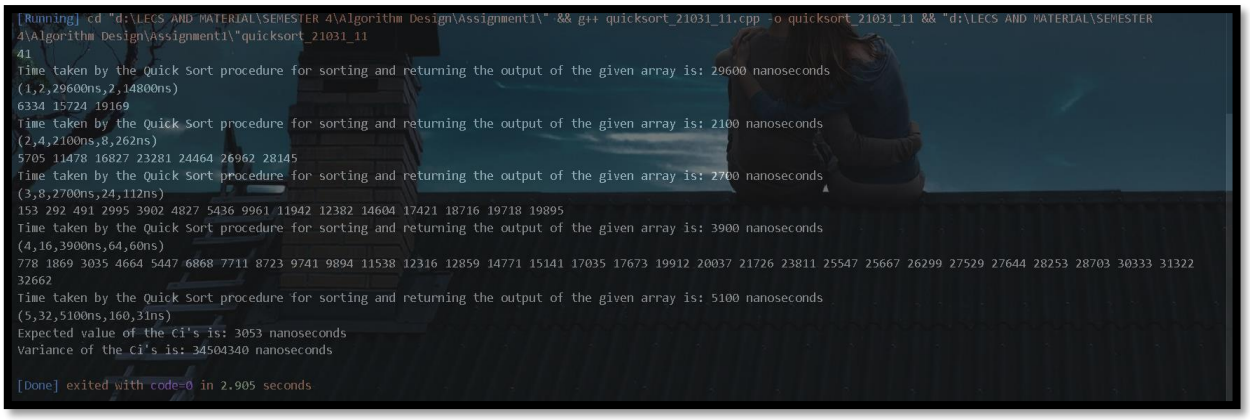
Q1: Test case 3: k = 8



Upon observing the results of various test cases for Q1., we can say that as k increases the value of ci fluctuates with less magnitude i.e., ci tends to remain constant. When k = 8, we can see that the value of ci is 20ns, for k = 7 the value of ci is 31ns, and for k = 6, the value of ci is 29ns; thus, the change is extremely small since the time is in the order of -9.

Q2: Test case 1: k = 3





Q2: Test case 2: k = 5

Q2: Test case 3: k = 8

Upon observing the results of various test cases for Q2., we can say that as k increases the value of ci fluctuates with less magnitude i.e., ci tends to remain constant. When k = 8 we can see that the value of ci is 21ns and for k = 7 the value of ci is 25ns thus, the change is extremely small since the time is in the order of -9.