Program Structures and Algorithms
Assignment 4

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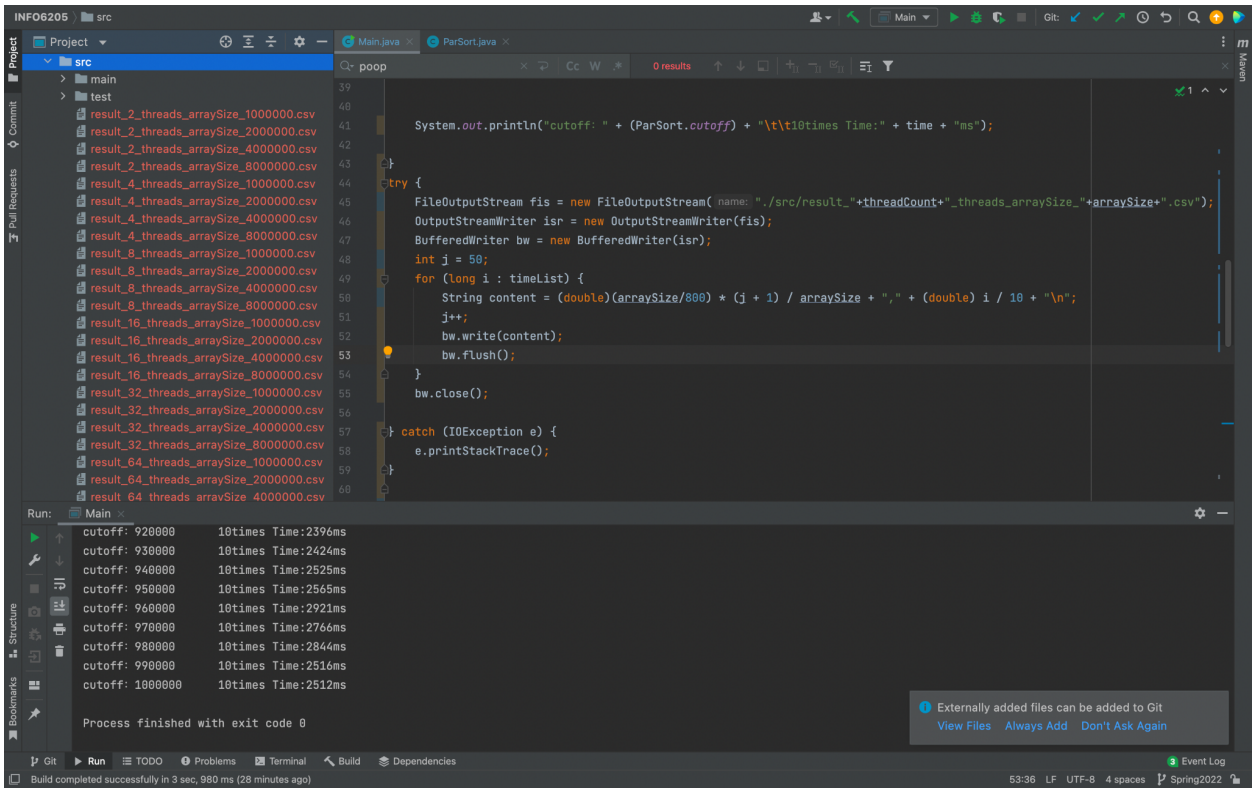
Q1.)

Task:

1. A cutoff (defaults to, say, 1000) which you will update according to the first argument in the command line when running. It's your job to experiment and come up with a good value for this cutoff. If there are fewer elements to sort than the cutoff, then you should use the system sort instead.
2. Recursion depth or the number of available threads. Using this determination, you might decide on an ideal number (t) of separate threads (stick to powers of 2) and arrange for that number of partitions to be parallelized (by preventing recursion after the depth of lg t is reached).
3. An appropriate combination of these.

Output: Following is the screenshot of the output files



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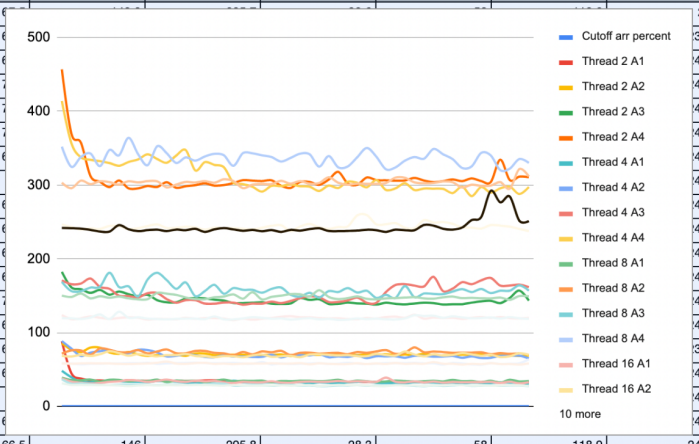
Evidence: Following is the screenshot

Thread 16 A1	Thread 16 A2	Thread 16 A3	Thread 16 A4	Thread 32 A1	Thread 32 A2	Thread 32 A3	Thread 32 A4	Thread 64 A1	Thread 64 A2	Thread 64 A3
37.6	**68.5**	**150.1**	**303.2**	**36.8**	**58.3**	**123.7**	**246.6**	**31.3**	**58.1**	**119.6**
33.5	6						243	28.9	57.7	119.3
31.9	6						39.7	29.1	58.2	118.3
30.9	6						41.2	28.8	58.3	120.3
31.6	7						40.5	28.7	58.1	124.6
33.1	7						44.6	28.7	58.1	118.3
33.9	7						44.1	28.3	57.6	128.2
35.6	6						40.1	27.5	57.4	120
34.8							41.5	28.3	57.7	120.6
33.1	6						44.4	28.7	58.1	118.9
34.4	6						46.7	28.3	59	118.4
36.2	6						41.7	28.7	60.7	117.9
34.1	6						42.1	28.5	58	118.5
33.2	7						43.4	28.6	57.6	118.9
34.7	6						42.6	28.8	58.6	119
33.9	6						39.6	28.8	59	118.2
34.4	6						42.3	28.4	57.5	121.9
32.5							41.5	28.1	58	118
31.6	6						41.6	28.8	57.2	117.7
33.1	66.5	146	295.8	28.3	58	118.9	240.6	28.4	57.8	119.1
32.5	69	154.7	300.5	28.5	57.7	117.5	239.9	28	57.9	120.8



Conclusion: As per the above graph that is plotted for time taken vs cutoff values for various thread sizes it can be concluded that the performance is not effected by the cuttoff values and for each array size the best performance is derived when we use 64 threads.