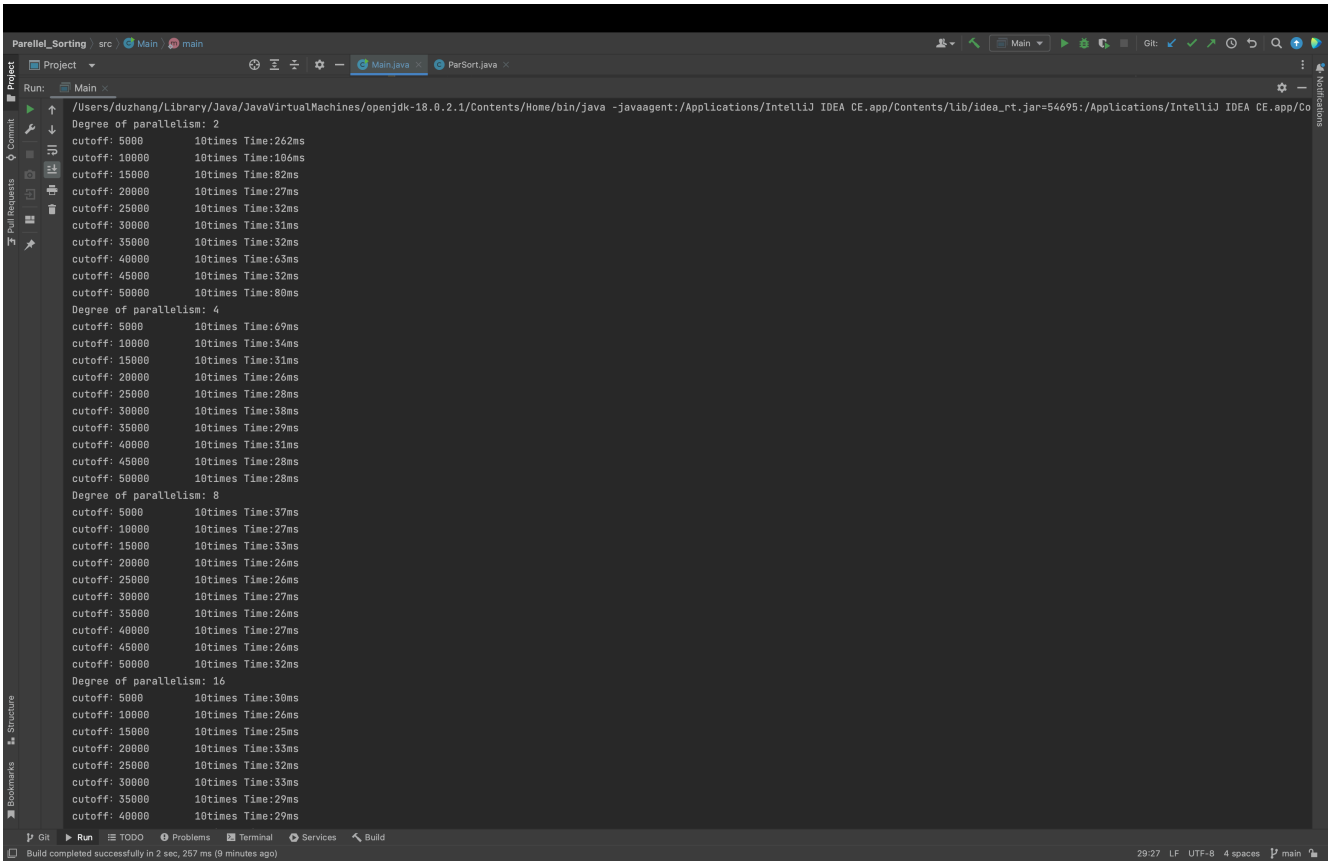
All threads(degree of parallelism) are **between 2 and 64**.

- **Experiment 1:** Array size = **100000**, cutoff **between 5000 and 50000**.

Screen shot:



Output:

Degree of parallelism: 2

cutoff：5000 10times Time:262ms

cutoff：10000 10times Time:106ms

cutoff：15000 10times Time:82ms

cutoff：20000 10times Time:27ms

cutoff：25000 10times Time:32ms

cutoff：30000 10times Time:31ms

cutoff：35000 10times Time:32ms

cutoff：40000 10times Time:63ms

cutoff：45000 10times Time:32ms

cutoff：50000 10times Time:80ms

Degree of parallelism: 4

cutoff：5000	10times Time:69ms
cutoff：10000	10times Time:34ms
cutoff：15000	10times Time:31ms
cutoff：20000	10times Time:26ms
cutoff：25000	10times Time:28ms
cutoff：30000	10times Time:38ms
cutoff：35000	10times Time:29ms
cutoff：40000	10times Time:31ms
cutoff：45000	10times Time:28ms
cutoff：50000	10times Time:28ms

Degree of parallelism: 8

cutoff：5000	10times Time:37ms
cutoff：10000	10times Time:27ms
cutoff：15000	10times Time:33ms
cutoff：20000	10times Time:26ms
cutoff：25000	10times Time:26ms
cutoff：30000	10times Time:27ms
cutoff：35000	10times Time:26ms
cutoff：40000	10times Time:27ms
cutoff：45000	10times Time:26ms
cutoff：50000	10times Time:32ms

Degree of parallelism: 16

cutoff：5000	10times Time:30ms
cutoff：10000	10times Time:26ms
cutoff：15000	10times Time:25ms
cutoff：20000	10times Time:33ms
cutoff：25000	10times Time:32ms
cutoff：30000	10times Time:33ms
cutoff：35000	10times Time:29ms
cutoff：40000	10times Time:29ms
cutoff：45000	10times Time:29ms
cutoff：50000	10times Time:26ms

Degree of parallelism: 32

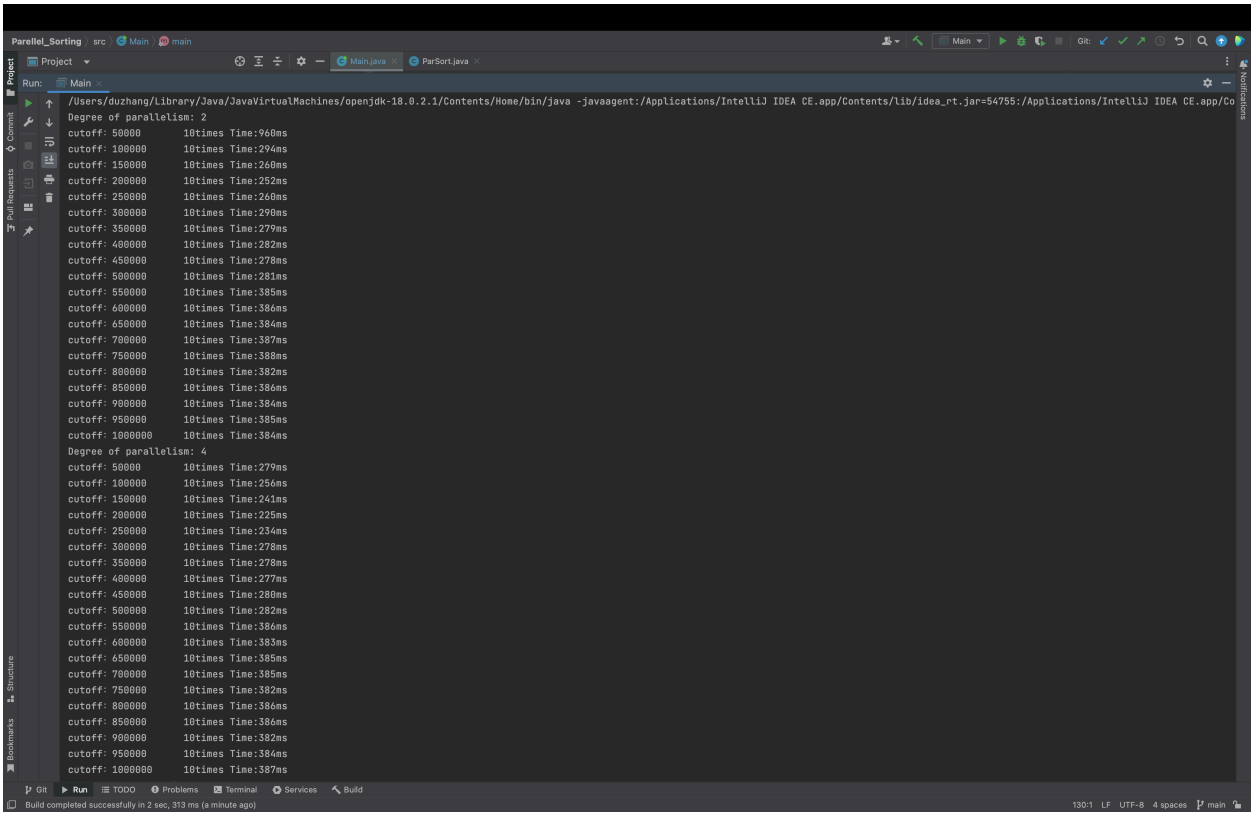
cutoff：5000	10times Time:31ms
cutoff：10000	10times Time:38ms
cutoff：15000	10times Time:27ms
cutoff：20000	10times Time:30ms
cutoff：25000	10times Time:23ms
cutoff：30000	10times Time:27ms
cutoff：35000	10times Time:27ms
cutoff：40000	10times Time:26ms
cutoff：45000	10times Time:26ms
cutoff：50000	10times Time:25ms

Degree of parallelism: 64

cutoff：5000	10times Time:30ms
cutoff：10000	10times Time:24ms
cutoff：15000	10times Time:30ms
cutoff：20000	10times Time:22ms
cutoff：25000	10times Time:22ms
cutoff：30000	10times Time:25ms
cutoff：35000	10times Time:26ms
cutoff：40000	10times Time:25ms
cutoff：45000	10times Time:26ms
cutoff：50000	10times Time:26ms

Experiment 2: Array size = **1000000**, cutoff **between 50000 and 1500000**.

Screen shot:



Output:

Degree of parallelism: 2

cutoff：50000 10times Time:960ms

cutoff：100000 10times Time:294ms

cutoff：150000 10times Time:260ms

cutoff：200000 10times Time:252ms

cutoff：250000 10times Time:260ms

cutoff：300000 10times Time:290ms

cutoff：350000 10times Time:279ms

cutoff：400000 10times Time:282ms

cutoff：450000 10times Time:278ms

cutoff：500000 10times Time:281ms

cutoff：550000 10times Time:385ms

cutoff：600000 10times Time:386ms

cutoff：650000 10times Time:384ms

cutoff：700000 10times Time:387ms
cutoff：750000 10times Time:388ms
cutoff：800000 10times Time:382ms
cutoff：850000 10times Time:386ms
cutoff：900000 10times Time:384ms
cutoff：950000 10times Time:385ms
cutoff：1000000 10times Time:384ms

Degree of parallelism: 4
cutoff：50000 10times Time:279ms
cutoff：100000 10times Time:256ms
cutoff：150000 10times Time:241ms
cutoff：200000 10times Time:225ms
cutoff：250000 10times Time:234ms
cutoff：300000 10times Time:278ms
cutoff：350000 10times Time:278ms
cutoff：400000 10times Time:277ms
cutoff：450000 10times Time:280ms
cutoff：500000 10times Time:282ms
cutoff：550000 10times Time:386ms
cutoff：600000 10times Time:383ms
cutoff：650000 10times Time:385ms
cutoff：700000 10times Time:385ms
cutoff：750000 10times Time:382ms
cutoff：800000 10times Time:386ms
cutoff：850000 10times Time:386ms
cutoff：900000 10times Time:382ms
cutoff：950000 10times Time:384ms
cutoff：1000000 10times Time:387ms

Degree of parallelism: 8
cutoff：50000 10times Time:266ms
cutoff：100000 10times Time:254ms
cutoff：150000 10times Time:227ms
cutoff：200000 10times Time:229ms
cutoff：250000 10times Time:231ms

cutoff：300000 10times Time:282ms
cutoff：350000 10times Time:279ms
cutoff：400000 10times Time:281ms
cutoff：450000 10times Time:278ms
cutoff：500000 10times Time:280ms
cutoff：550000 10times Time:386ms
cutoff：600000 10times Time:385ms
cutoff：650000 10times Time:390ms
cutoff：700000 10times Time:384ms
cutoff：750000 10times Time:381ms
cutoff：800000 10times Time:384ms
cutoff：850000 10times Time:380ms
cutoff：900000 10times Time:380ms
cutoff：950000 10times Time:385ms
cutoff：1000000 10times Time:376ms

*Results of threads between 16 and 64 are almost identical hence ignored.

- **Conclusion:**

1. The efficacy of the algorithm seems to be stable and remains the same after **threads of 8** so basically there's no need to increase threads to more than 8 and the best cutoff is somewhere **between 20% ~ 25% of array size.**

2. In a nutshell, we can conclude that the parallel sorting algorithm performs the best with a thread of 8 and cutoff of 20% ~ 25% of the target array size.