

Assignment4 Report

The image displays two screenshots of an IDE (IntelliJ IDEA) showing the execution results of a Java program. The program is running in the 'Main' context, and the output is displayed in the 'Run' window.

Top Screenshot: The output shows the results for a degree of parallelism of 16. The program executed 10 times, with the cutoff time for each execution recorded. The cutoff times range from 53ms to 62ms.

Cutoff	Time
510000	59ms
520000	58ms
530000	58ms
540000	57ms
550000	50ms
560000	53ms
570000	51ms
580000	60ms
590000	58ms
600000	50ms
610000	51ms
620000	51ms
630000	50ms
640000	51ms
650000	51ms
660000	50ms
670000	50ms
680000	56ms
690000	50ms
700000	50ms
710000	50ms
720000	50ms
730000	51ms
740000	50ms
750000	50ms
760000	50ms
770000	56ms
780000	58ms
790000	57ms
800000	62ms
810000	57ms
820000	61ms

Bottom Screenshot: The output shows the results for a degree of parallelism of 8. The program executed 10 times, with the cutoff time for each execution recorded. The cutoff times range from 49ms to 65ms.

Cutoff	Time
830000	56ms
840000	55ms
850000	59ms
860000	54ms
870000	52ms
880000	51ms
890000	65ms
900000	53ms
910000	52ms
920000	50ms
930000	81ms
940000	53ms
950000	50ms
960000	49ms
970000	49ms
980000	63ms
990000	49ms
1000000	49ms

After the 10 executions, the program outputted the degree of parallelism: 8.

Cutoff	Time
510000	49ms
520000	49ms
530000	49ms
540000	49ms
550000	50ms
560000	49ms
570000	54ms
580000	49ms
590000	49ms
600000	51ms
610000	49ms
620000	50ms
630000	49ms
640000	50ms
650000	50ms

INFO6205-CherylShi | src | main | java | edu | neu | coe | info6205 | sort | par | Main | main

Project | Main.java | ParSort.java

Run: Main

cutoff: 660000	10times Time:50ms
cutoff: 670000	10times Time:49ms
cutoff: 680000	10times Time:53ms
cutoff: 690000	10times Time:50ms
cutoff: 700000	10times Time:49ms
cutoff: 710000	10times Time:49ms
cutoff: 720000	10times Time:54ms
cutoff: 730000	10times Time:59ms
cutoff: 740000	10times Time:55ms
cutoff: 750000	10times Time:53ms
cutoff: 760000	10times Time:52ms
cutoff: 770000	10times Time:49ms
cutoff: 780000	10times Time:52ms
cutoff: 790000	10times Time:49ms
cutoff: 800000	10times Time:53ms
cutoff: 810000	10times Time:50ms
cutoff: 820000	10times Time:52ms
cutoff: 830000	10times Time:52ms
cutoff: 840000	10times Time:50ms
cutoff: 850000	10times Time:49ms
cutoff: 860000	10times Time:50ms
cutoff: 870000	10times Time:56ms
cutoff: 880000	10times Time:49ms
cutoff: 890000	10times Time:49ms
cutoff: 900000	10times Time:49ms
cutoff: 910000	10times Time:53ms
cutoff: 920000	10times Time:48ms
cutoff: 930000	10times Time:49ms
cutoff: 940000	10times Time:58ms
cutoff: 950000	10times Time:55ms
cutoff: 960000	10times Time:52ms
cutoff: 970000	10times Time:55ms
cutoff: 980000	10times Time:52ms
cutoff: 990000	10times Time:52ms

Git | Run | TODO | Problems | Profiler | Dependencies | Build | Terminal

208:1 | LF | UTF-8 | 4 spaces | main | Event Log

INFO6205-CherylShi | src | main | java | edu | neu | coe | info6205 | sort | par | Main | main

Project | Main.java | ParSort.java

Run: Main

cutoff: 1000000	10times Time:49ms
Degree of parallelism: 4	
cutoff: 510000	10times Time:86ms
cutoff: 520000	10times Time:82ms
cutoff: 530000	10times Time:80ms
cutoff: 540000	10times Time:88ms
cutoff: 550000	10times Time:82ms
cutoff: 560000	10times Time:89ms
cutoff: 570000	10times Time:84ms
cutoff: 580000	10times Time:86ms
cutoff: 590000	10times Time:90ms
cutoff: 600000	10times Time:89ms
cutoff: 610000	10times Time:84ms
cutoff: 620000	10times Time:84ms
cutoff: 630000	10times Time:85ms
cutoff: 640000	10times Time:86ms
cutoff: 650000	10times Time:87ms
cutoff: 660000	10times Time:83ms
cutoff: 670000	10times Time:88ms
cutoff: 680000	10times Time:89ms
cutoff: 690000	10times Time:89ms
cutoff: 700000	10times Time:85ms
cutoff: 710000	10times Time:84ms
cutoff: 720000	10times Time:88ms
cutoff: 730000	10times Time:87ms
cutoff: 740000	10times Time:85ms
cutoff: 750000	10times Time:87ms
cutoff: 760000	10times Time:84ms
cutoff: 770000	10times Time:85ms
cutoff: 780000	10times Time:88ms
cutoff: 790000	10times Time:87ms
cutoff: 800000	10times Time:83ms
cutoff: 810000	10times Time:88ms
cutoff: 820000	10times Time:88ms

Git | Run | TODO | Problems | Profiler | Dependencies | Build | Terminal

208:1 | LF | UTF-8 | 4 spaces | main | Event Log

```
INFO6205-CherylSHI | src | main | java | edu | neu | coe | info6205 | sort | par | Main | main
Project | Main.java | ParSort.java
Run: Main
cutoff: 830000 10times Time:85ms
cutoff: 840000 10times Time:87ms
cutoff: 850000 10times Time:87ms
cutoff: 860000 10times Time:88ms
cutoff: 870000 10times Time:84ms
cutoff: 880000 10times Time:80ms
cutoff: 890000 10times Time:87ms
cutoff: 900000 10times Time:86ms
cutoff: 910000 10times Time:82ms
cutoff: 920000 10times Time:92ms
cutoff: 930000 10times Time:82ms
cutoff: 940000 10times Time:98ms
cutoff: 950000 10times Time:88ms
cutoff: 960000 10times Time:88ms
cutoff: 970000 10times Time:90ms
cutoff: 980000 10times Time:85ms
cutoff: 990000 10times Time:86ms
cutoff: 1000000 10times Time:89ms
Degree of parallelism: 2
cutoff: 510000 10times Time:151ms
cutoff: 520000 10times Time:151ms
cutoff: 530000 10times Time:116ms
cutoff: 540000 10times Time:148ms
cutoff: 550000 10times Time:161ms
cutoff: 560000 10times Time:124ms
cutoff: 570000 10times Time:159ms
cutoff: 580000 10times Time:124ms
cutoff: 590000 10times Time:151ms
cutoff: 600000 10times Time:150ms
cutoff: 610000 10times Time:149ms
cutoff: 620000 10times Time:118ms
cutoff: 630000 10times Time:118ms
cutoff: 640000 10times Time:120ms
cutoff: 650000 10times Time:160ms
Git | Run | TODO | Problems | Profiler | Dependencies | Build | Terminal
10:1 (33 chars, 1 line break) LF UTF-8 4 spaces P main
```

Conclusion:

For an array of fixed size of 200000, setting threads of 16,8,4,2, we can see when thread = 8 , parallel sort is the most efficient.