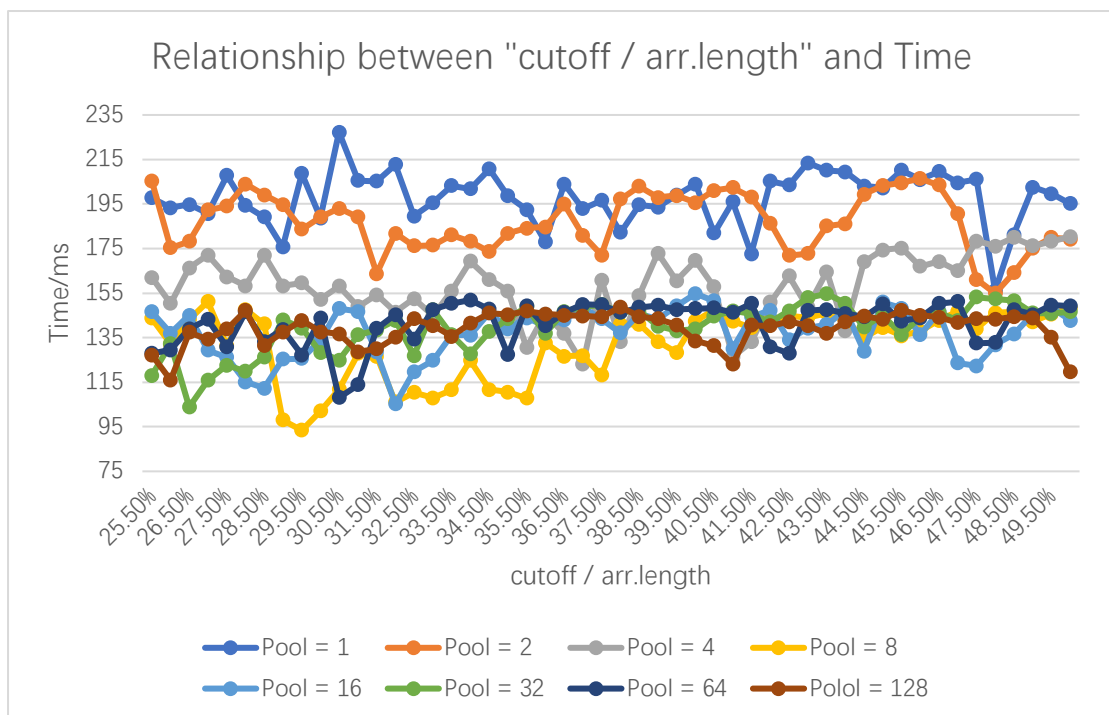


INFO6205 - Parallel Sorting

In this research, I change the number of available ForkJoinPool in multiple asynchronous threads and observe the relationship between “cutoff / array.length” ratio and time. Here is the data below:

Ratio	Pool = 1	Pool = 2	Pool = 4	Pool = 8	Pool = 16	Pool = 32	Pool = 64	Pool = 128
25.50%	197.8	205.4	162	143.7	146.6	118.1	128	127.3
26.00%	193.4	175.4	150.4	132.1	137	132.2	129.6	116
26.50%	194.7	178.3	166.3	143.2	145	103.9	139	137.5
27.00%	190.7	192.3	172.1	151.2	129.4	115.9	143.2	134.3
27.50%	207.8	194.1	162.3	131.4	126.2	122.6	130.8	138.9
28.00%	194.3	204	158.3	147.6	115.1	119.9	146.6	147.2
28.50%	189.2	199.1	172.1	141.1	112.3	126.4	133.2	131.5
29.00%	175.7	194.7	158.2	98.1	125.4	143.1	138.7	137.5
29.50%	208.7	183.7	159.6	93.4	125.7	139.3	127.3	142.8
30.00%	188.8	189.2	152.2	102.1	133.9	128.4	143.7	137.6
30.50%	227.3	193.1	158.1	111.8	148.1	125	108.1	136.7
31.00%	205.5	189.2	149	128	146.8	136.3	113.8	128.6
31.50%	205.2	163.8	154.2	126.7	128.5	138.4	139.2	129.9
32.00%	212.7	181.8	146.5	106.1	105.2	142.7	145.4	135.1
32.50%	189.6	176.3	152.5	110.4	119.8	126.9	134.4	143.4
33.00%	195.6	176.5	144.8	108	124.8	147.5	147.7	140.5
33.50%	203.3	181.1	156	111.6	136.2	136.3	150.3	135.5
34.00%	201.8	178.3	169.4	124.8	136.1	127.8	151.9	141.4
34.50%	210.7	173.7	161.2	111.7	146.2	137.7	147.8	146
35.00%	198.7	181.8	156	110.6	139	143.5	127.4	145.4
35.50%	192.4	184.1	130.5	107.9	143.9	148.9	149.2	146.9
36.00%	178.1	184.7	145.6	132.7	140.2	136.8	140.3	145.6
36.50%	203.9	194.9	136.9	126.7	142.9	146.8	146.4	145.1
37.00%	192.9	181	123.2	126.9	148.7	148.8	150	144.7
37.50%	196.6	172	160.9	118.2	143.4	149.8	149.8	144.4
38.00%	182.3	197.2	133.2	140.9	137.1	146.5	146.4	148.8
38.50%	194.6	202.9	154	141	145.6	147	148.7	144.5
39.00%	193.6	197.9	173	133.2	143.3	140.1	149.5	143.5
39.50%	198.9	198.8	160.5	128.4	149.2	138.1	147.7	140.7
40.00%	204	195.7	169.6	142.4	154.8	138.9	148	133.6
40.50%	182	201.1	157.8	147.5	151.5	144.6	148.3	131.4

41.00%	196.1	202.4	126.4	142.4	130.1	147.1	146.3	123.1
41.50%	172.7	198.1	133.1	139.4	144.3	145.6	150.4	140.6
42.00%	205.3	186.5	150.9	142.6	147.4	142.1	130.9	140.3
42.50%	203.6	171.9	162.7	144.8	134	147	128	142.2
43.00%	213.4	172.8	148.7	144	139.3	153	147.2	140.5
43.50%	210.1	185.2	164.6	146	140.9	154.7	147.7	136.8
44.00%	209.4	186.2	138.2	142.8	147.3	150.5	145.9	142.2
44.50%	203.1	199.4	169	135	128.9	139.8	144.3	144.8
45.00%	202.3	203.3	174.3	139.6	151	145.1	150.1	143.2
45.50%	210.1	204.5	175.2	135.9	148.2	136.5	142.5	147.3
46.00%	206	206.4	167	137.9	136.3	144.2	143.9	145.1
46.50%	209.6	203.6	169.2	142.7	146.7	146.3	150.4	144.2
47.00%	204.6	190.6	165	146.8	123.6	142.7	151.3	141.8
47.50%	206.1	161.1	178.4	139	122.4	153.3	132.6	143.6
48.00%	156.1	154.9	176.1	146.2	131.8	152.4	132.8	143.3
48.50%	181.3	164.2	179.9	146.7	136.6	151.6	147.7	144.4
49.00%	202.5	175.2	176.2	142.2	145.6	146.1	145.4	143.9
49.50%	199.6	179.9	178.2	145.6	148.5	145.9	149.6	135.3
50.00%	195.2	179.3	180.4	148.3	142.7	146.7	149.2	119.6



It shows that the number of ForkJoinPool does affect the operation time when it close to the necessary number of pools. But when the number of ForkJoinPool is high enough, the effect on operation time can be ignored.