

Assignment 3

1. CPU utilization = $1 - 0.75^8 \approx 90\%$

2.

1	1	2	3	3	3	4	1	1	5	5	5	5	5	1	1	1	1	1	1	1	1	1
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avg wait time = $(0+0+0+1+0)/5 = 2.2$

3.

1	1	1	2	1	3	4	4	3	1	3	5	1	5	1	5	1	5	1	5	1	1	1
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number of context switches = 19

4.

1	1	1	1	1	1	1	2	4	3	3	3	5	5	5	5	5	1	1	1	1	1	1
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6. The results are very close to expected. The time is less because multithreading divides the workload compared to original.

# threads		observed timing	observed speedup	expected speedup
medium.txt	original program	18.983	1.0	1.0
	1	18.951	1.0	1.0
	2	10.235	1.9	2.0
	3	7.463	2.5	3.0
	4	5.822	3.3	4.0
	8	4.629	4.1	8.0
	16	4.251	4.5	16.0
hard.txt	original program	6.435	1.0	1.0
	1	6.429	1.0	1.0
	2	3.301	1.9	2.0
	3	2.197	2.9	3.0
	4	1.661	3.9	4.0
	8	0.834	7.7	8.0
	16	0.422	15.2	16.0
hard2.txt	original program	6.645	1.0	1.0
	1	6.558	1.0	1.0
	2	3.320	2.0	2.0
	3	2.196	3.0	3.0
	4	1.679	4.0	4.0
	8	0.835	8.0	8.0
	16	0.456	14.6	16.0