Algorithm

Graph traversal is carried out by starting from every vertex in the graph and "visiting" all its outbound neighbours. The recurrence stops when the length of the current path reaches the number of nodes in the graph.

The algorithm uses an AtomicBoolean which is set whenever the first Hamiltionian cycle is found, and so the search from the other nodes will be skipped.

The search was parallelized by using a Thread Pool with a fixed number of threads, and runnable tasks were submitted to the pool with each task having different starting vertex. This evenly distributed workload made parallelization possible.

Experiments

Nb. of vertices	Nb. of Threads	Time (ms)
5	1	4
5	2	1
5	3	1
5	4	0
5	5	1
5	10	1
5	15	1
5	30	0
10	1	0
10	2	0
10	3	1
10	4	2
10	5	0
10	10	1
10	15	1
10	30	5
50	1	0
50	2	1
50	3	0
50	4	1
50	5	1

50	10	1
50	15	2
50	30	3
100	1	0
100	2	1
100	3	0
100	4	0
100	5	1
100	10	2
100	15	1
100	30	3
500	1	1
500	2	1
500	3	1
500	4	2
500	5	2
500	10	1
500	15	3
500	30	3
1000	1	1
1000	2	2
1000	3	3
1000	4	3
1000	5	3
1000	10	3
1000	15	4
1000	30	7
2500	1	53
2500	2	8
2500	3	8
2500	4	7
2500	5	7
2500	10	9
2500	15	10
2500	30	11
5000	1	29
5000	2	29
5000	3	29
5000	4	30
5000	5	29
5000	10	35
5000	15	46

5000	30	95