Parallel Sudoku Solver

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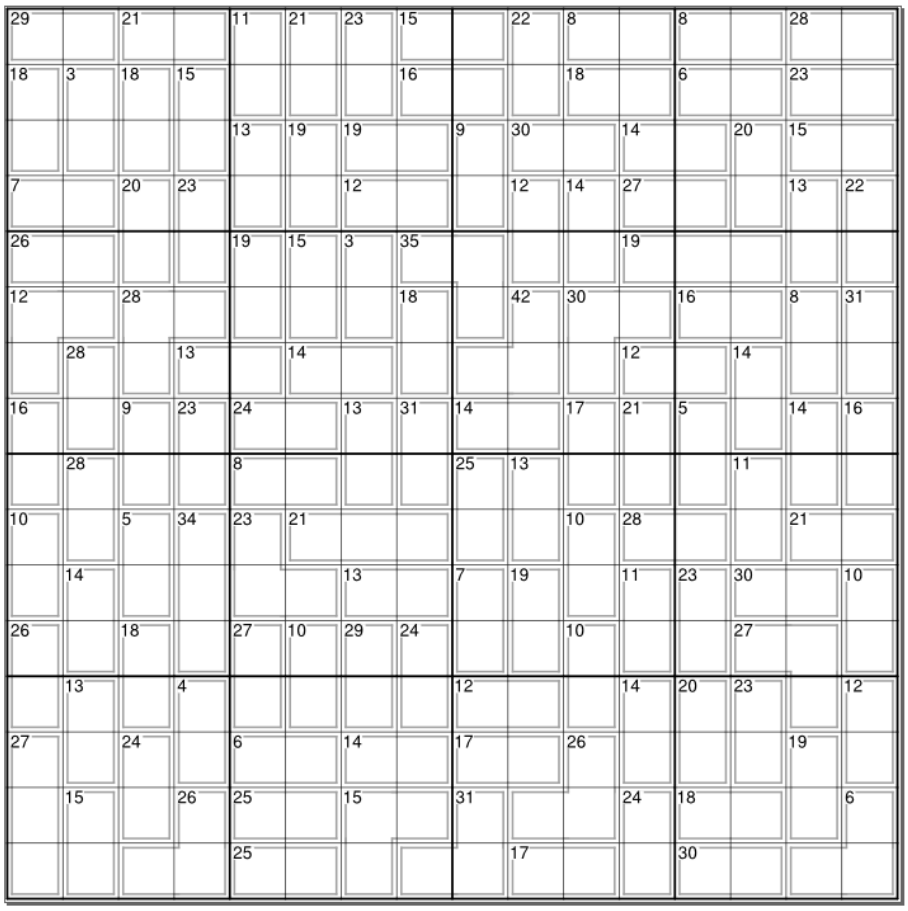


1 A Sat Reduction

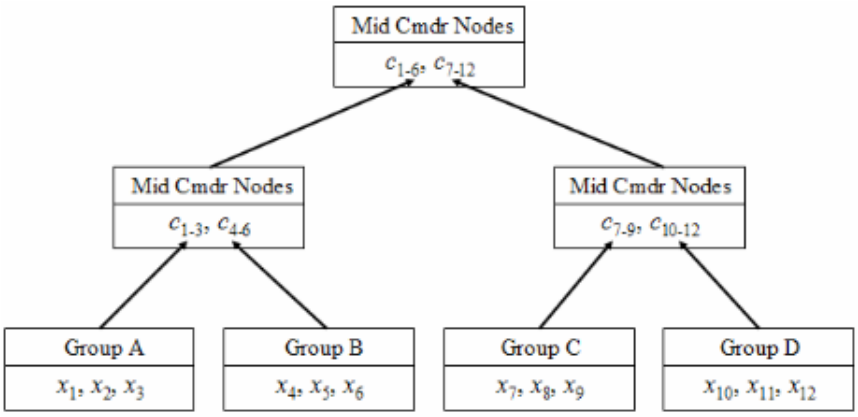
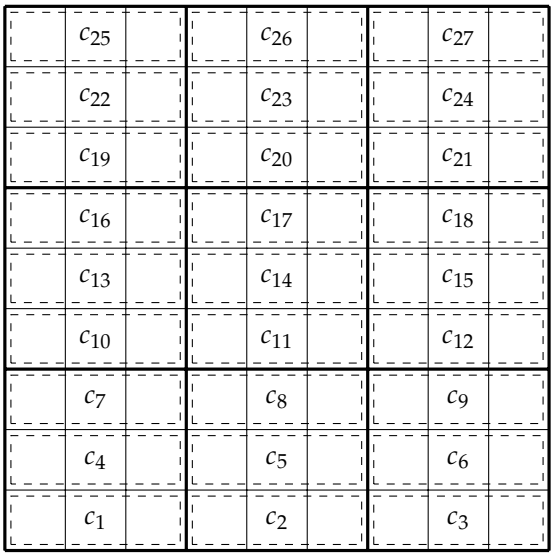


Figure 1: Graphical Depiction of Commander Variable Encoding

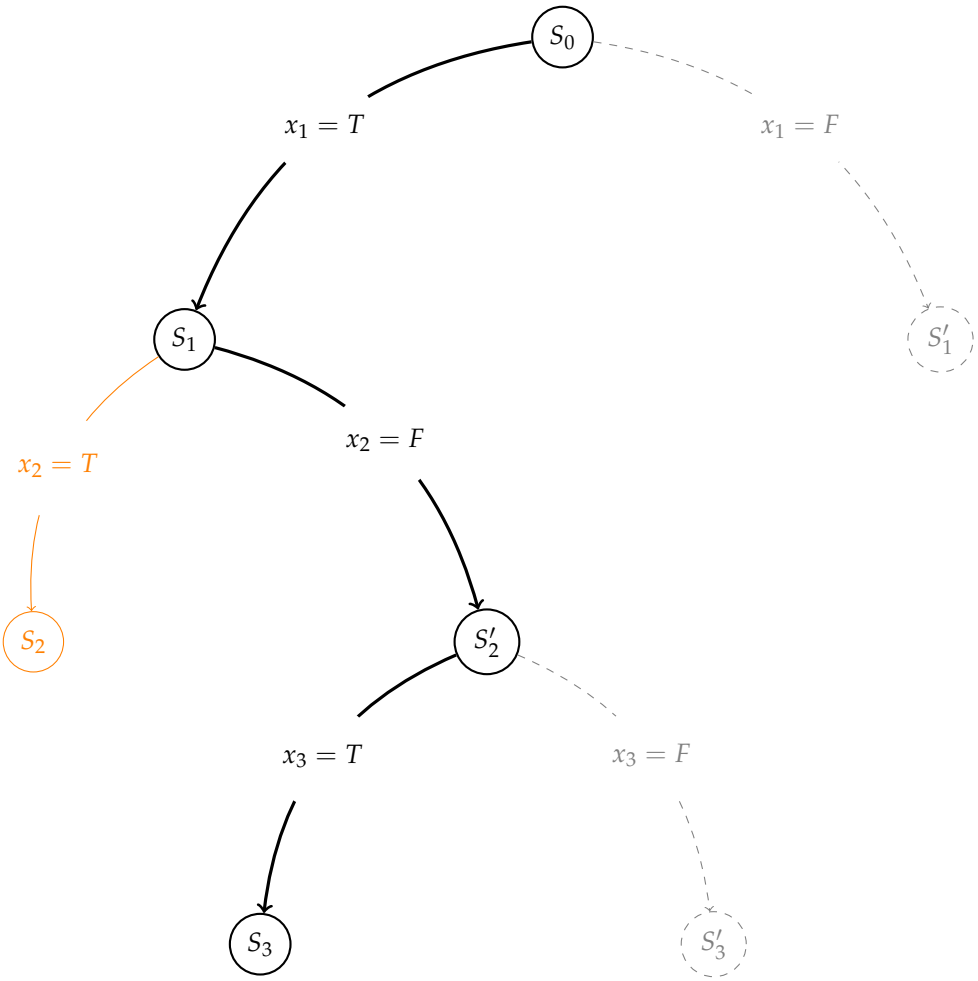


$$[\text{digitInCage}] \iff \bigwedge_{\text{cell}\in\text{cage}} [\text{digitInCell}] \tag{1}$$

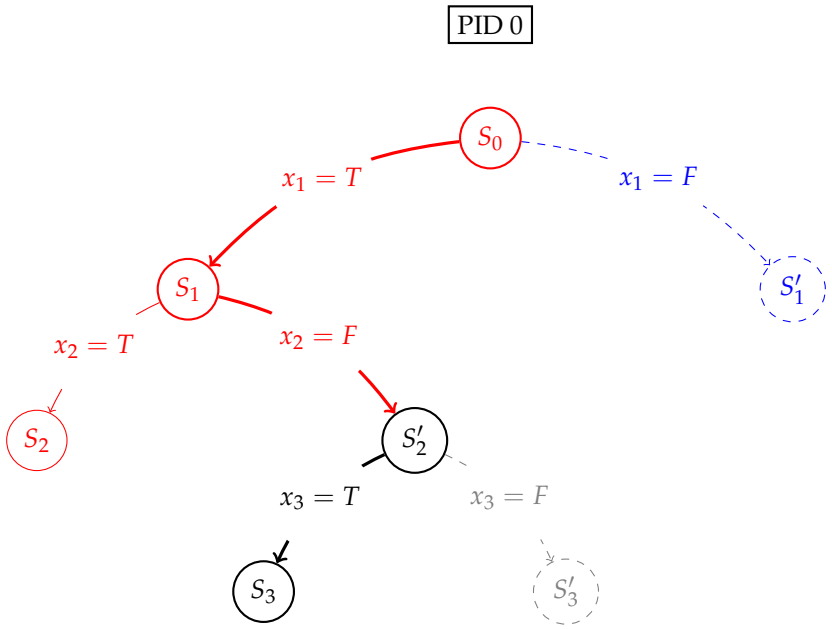
$$[\text{validPartition}] \iff \bigwedge_{\text{digit}\in\text{partition}} [\text{digitInCage}] \tag{2}$$

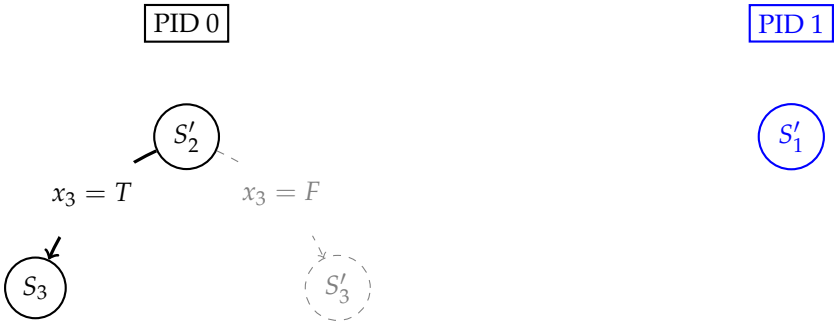
$$\bigvee_{\text{all partitions with valid sum}} [\text{validPartition}] \tag{3}$$

2 Recursive Algorithm



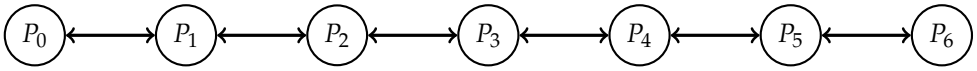
3 How to Steal Things



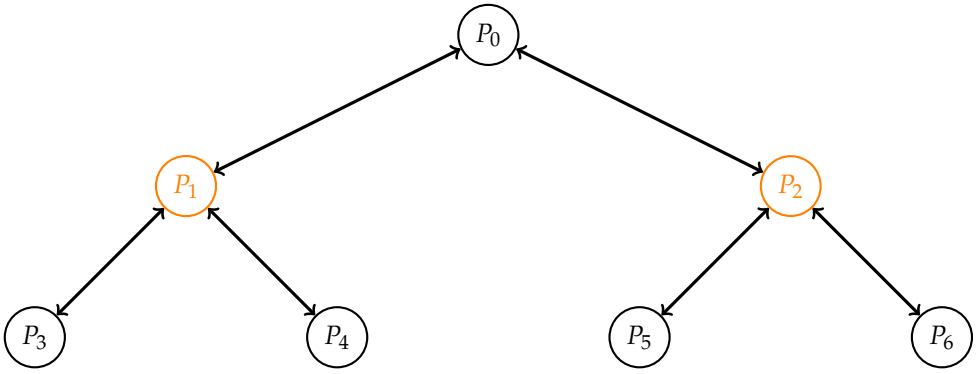


4 Public Speaking

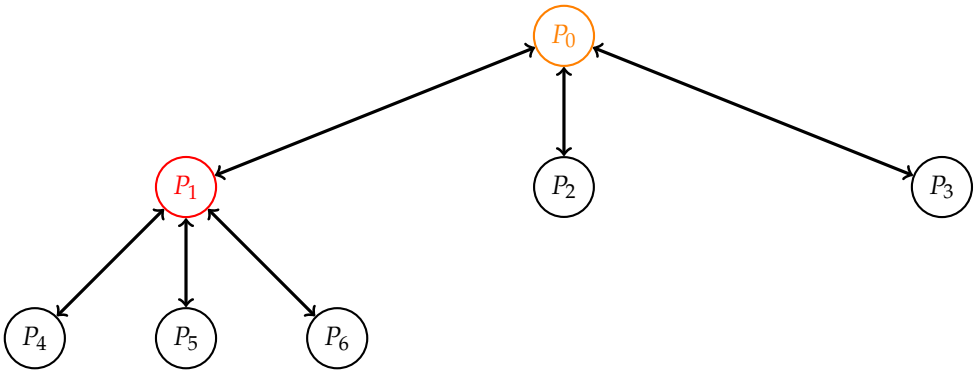
Branching factor 1 (low contention) (high latency)



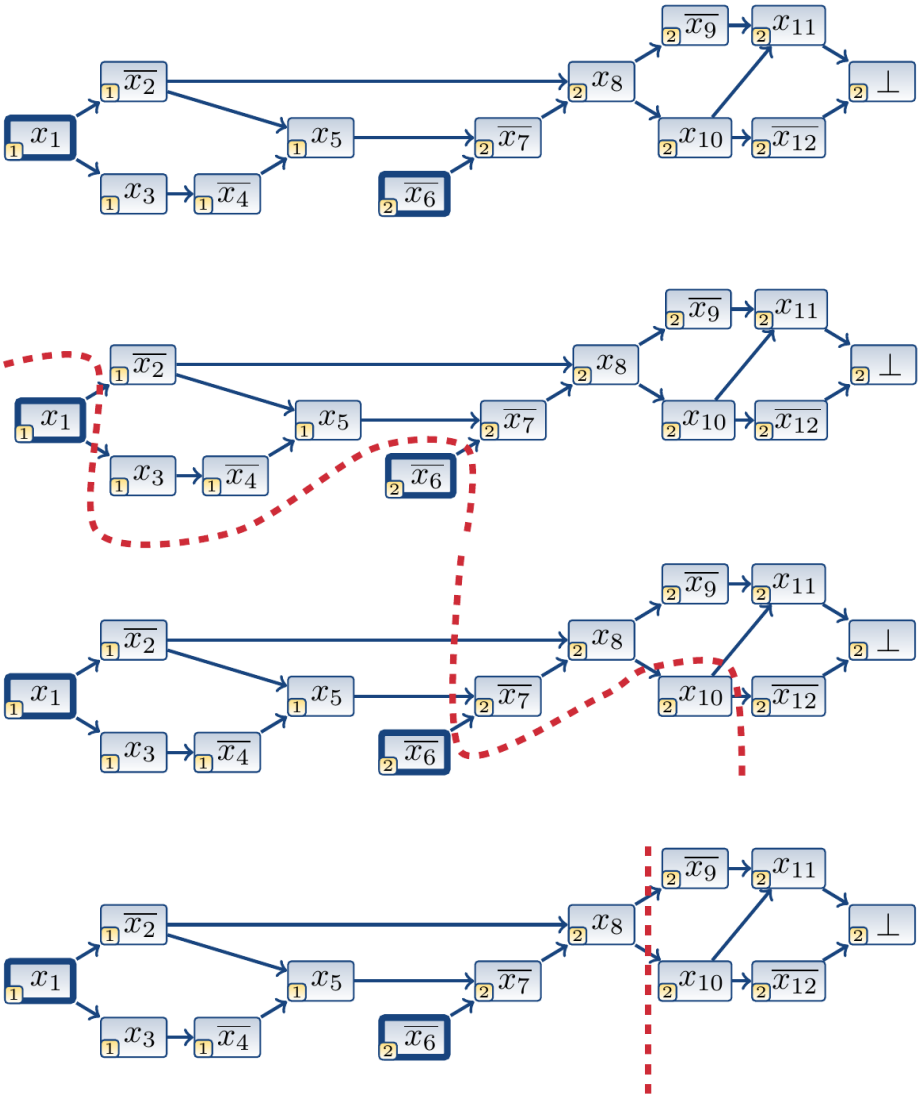
Branching factor 2 (okay contention) (okay latency)



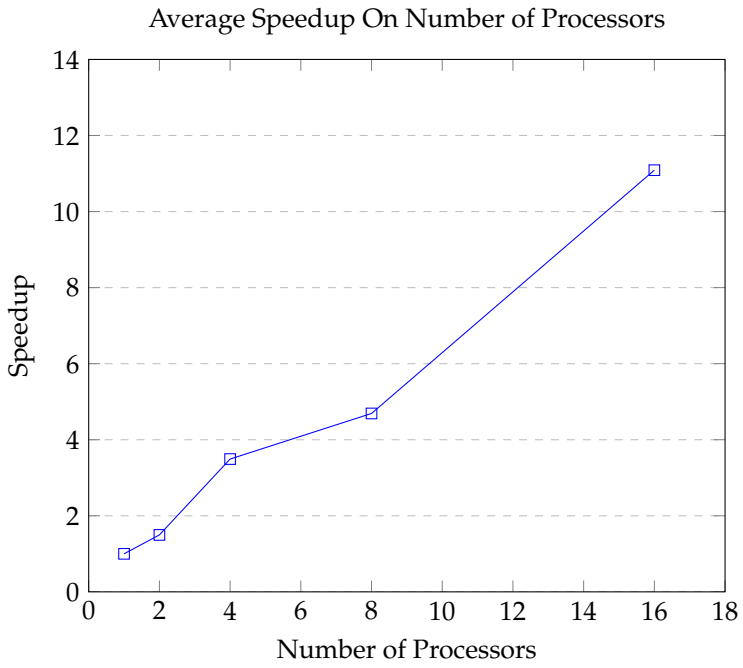
Branching factor 3 (high contention) (low latency)



5 Conflict Resolution



6 Performance!



Puzzle Number	$n = 1$	$n = 2$	$n = 4$	$n = 8$	$n = 16$
0	29.0	89.8	16.9	1.90	1.00
1	12.69	7.81	1.35	1.70	0.89
2	23.66	14.5	6.88	3.85	2.96
3	4.01	2.45	1.90	2.41	0.77

7 How Perf-ect?

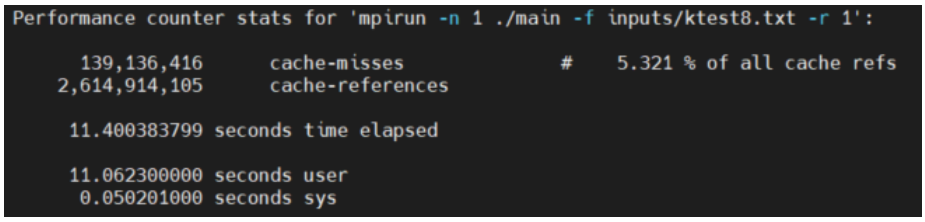


Figure 2: Perf stat on $n = 1$ for cache-references and cache-misses.

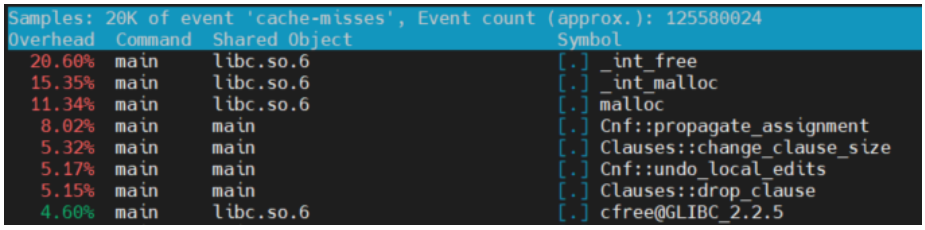


Figure 3: Perf report on $n = 1$ for cache-misses

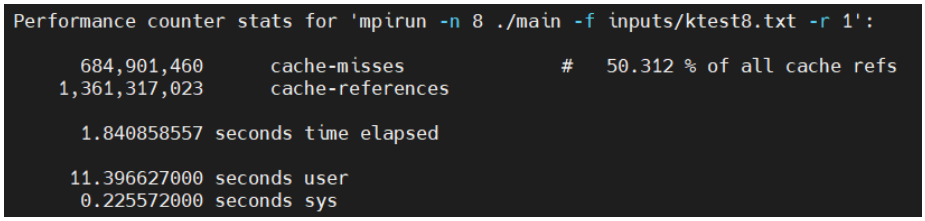


Figure 4: Perf stat on $n = 8$ for cache-references and cache-misses.

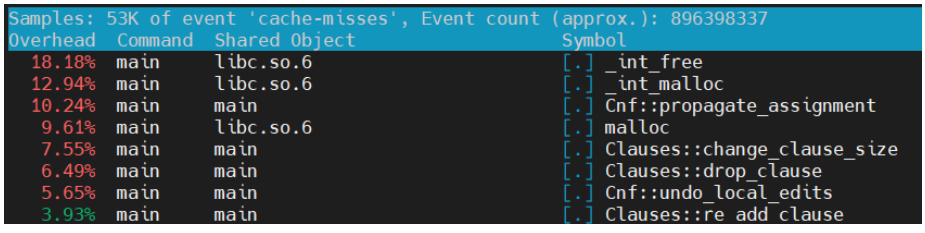


Figure 5: Perf report on $n = 8$ for cache-misses