Test: CPU vs GPU: solving CSPs

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1 Solving CSPs

We compared CPU and GPU on randomly generated CSPs defined by $\neq$ constraints between pairs of variables. We use this benchmark to test the performance of GPU-LNS on finding feasible starting points for the LNS strategy.

Table **??** reports the results in seconds for a CSP consisting of 70 variables and 200 constraints. In these experiments the starting points are generated considering one variable at a time, assigning it randomly with a value in its domain and subsequently propagating constraints to reduce domains of the other variables.

Table 1: CPU vs GPU: labeling & propagation.

$|\mathcal{N}|$	t	m	CPU sec	GPU sec	Speedup
10	1	1	0.349	0.216	1.61
10	20	20	0.507	0.231	2.19
10	50	50	1.702	0.477	3.56
10	80	80	4.079	0.608	6.70
10	100	100	6.543	0.890	7.35
20	1	1	0.216	0.218	0.99
20	20	20	0.592	0.242	2.44
20	50	50	1.842	0.379	4.86
20	80	80	4.516	0.597	7.56
20	100	100	6.932	0.802	8.64
30	1	1	0.216	0.218	0.99
30	20	20	0.600	0.242	2.47
30	50	50	2.460	0.377	6.52
30	80	80	5.693	0.668	8.52
30	100	100	8.683	0.820	10.58