

# CSE-318

## OFFLINE-2 ON CSP

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## Value Order Heuristic:

For value order heuristic the least constraining value was chosen. As for variable order heuristic it is preferred to fail first to decrease the number of branches. And for value order heuristic it is preferred to fail last. As this increases the chance to reach the goal state faster. But it doesn't matter if the input is solvable. Then failing first or last will give the same result.

## Result:

Input	Solver	VAH	#Node	#Backtrack	Runtime
d-10-01	Backtrack	VAH1	291	20	1ms
		VAH2			
		VAH3	77	1	1ms
		VAH4	203	15	1ms
		VAH5			
	Forward Check	VAH1	271	20	0ms
		VAH2	739521	569867	800ms
		VAH3	76	1	1ms
		VAH4	188	15	1ms
		VAH5	3936	2605	5ms
d-10-06	Backtrack	VAH1	58	0	1ms
		VAH2			
		VAH3	58	0	1ms
		VAH4	59	1	1ms
		VAH5			
	Forward Check	VAH1	58	0	1ms
		VAH2	3674427	2217685	3660ms
		VAH3	58	0	1ms
		VAH4	58	1	1ms
		VAH5	3492	2467	5ms
d-10-07	Backtrack	VAH1	268	22	1ms
		VAH2	26641951	6230656	17541ms
		VAH3	58	0	1ms
		VAH4	58	0	1ms
		VAH5			
	Forward Check	VAH1	246	22	1ms
		VAH2	32971	21802	34ms
		VAH3	58	0	1ms
		VAH4	58	0	1ms
		VAH5	20793	15021	34ms
d-10-08	Backtrack	VAH1	102	3	1ms
		VAH2			
		VAH3	382	30	1ms
		VAH4	732	84	1ms
		VAH5	100874	29756	97ms
	Forward Check	VAH1	99	3	1ms

		VAH2	45443578	36349776	50480ms
		VAH3	352	30	1ms
		VAH4	643	83	2ms
		VAH5	55216	40595	82ms
d-10-09	Backtrack	VAH1	67	1	1ms
		VAH2	13597542	2753367	9559ms
		VAH3	58	0	1ms
		VAH4	71	2	1ms
		VAH5			
	Forward Check	VAH1	66	1	1ms
		VAH2	96171	77289	111ms
		VAH3	58	0	1ms
		VAH4	69	2	1ms
		VAH5	61786	52795	90ms
d-15-01	Backtrack	VAH1	81883	7857	150ms
		VAH2			
		VAH3	81027	8412	176ms
		VAH4	289321	34376	611ms
		VAH5			
	Forward Check	VAH1	74026	7857	146ms
		VAH2			
		VAH3	72615	8412	170ms
		VAH4	252865	34194	567ms
		VAH5			

## Conclusion:

It is seen that VAH1, VAH3 and VAH4 perform consistently for all of the inputs. But as input gets larger and harder to solve VAH1 seems to outperform VAH3 and VAH3 seems to perform better for smaller outputs. VAH5 does a decent job randomly providing some good outputs and sometimes very bad. And for the last VAH2 seems to be the slowest. Surprisingly taking the minimum while calculating VAH2 provides a better result than before.