



Microsoft Solver Foundation test results

Here we present our runtime statistics when using the Microsoft Solver Foundation to solve random instances of the warehouse problem with different attributes. Every attribute is either of the value 'Low' or 'High'. The first table displays what high and low for the different attributes represents.

Attribute \ Value	Low	High
Demands	Demands on $\frac{1}{4}$ of all products	Demands on all products
Sparsity	No warehouses are empty	$\frac{1}{2}$ of all warehouses are empty
Products	Warehouses have at least 0 of each product	Warehouses have at least $\frac{1}{5}$ of the maximum demand of each product

Furthermore a column having the value '*' means that it did not terminate within a reasonable time frame (>12 hours). A value of '**' means that we did not bother to run the instance at all since the problem is considered harder than a previously unfinished problem.

Appendix A. Microsoft Solver Foundation test results

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
10x10	Low	Low	High	26	0.00100	4
	Low	Low	Low	25	0.17700	4
	Low	High	High	14	0.00000	2
	Low	High	Low	9	0.00000	2
	High	Low	High	13	0.00100	4
	High	Low	Low	45	0.18300	12
	High	High	High	37	0.00400	33
	High	High	Low	53	0.00400	20

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
10x100	Low	Low	High	33	0.00500	14
	Low	Low	Low	35	0.00400	12
	Low	High	High	39	0.00400	42
	Low	High	Low	32	0.00400	82
	High	Low	High	52	0.01900	4
	High	Low	Low	57	0.20200	19
	High	High	High	36	0.01700	65
	High	High	Low	21	0.01100	68

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
20x100	Low	Low	High	125	0.01300	6
	Low	Low	Low	110	0.01400	12
	Low	High	High	255	0.03000	15
	Low	High	Low	396	0.05500	24
	High	Low	High	97	0.03500	6
	High	Low	Low	224	0.27300	15
	High	High	High	334	0.13500	18
	High	High	Low	532	0.27000	40

Appendix A. Microsoft Solver Foundation test results

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
30x100	Low	Low	High	64	0.00800	6
	Low	Low	Low	288	0.04000	7
	Low	High	High	597	0.08100	10
	Low	High	Low	910	0.11900	13
	High	Low	High	196	0.07300	8
	High	Low	Low	212	0.27100	4
	High	High	High	4424	2.26600	35
	High	High	Low	1795	0.95700	27

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
40x100	Low	Low	High	208	0.03000	7
	Low	Low	Low	723	0.11300	8
	Low	High	High	1862	0.28000	21
	Low	High	Low	838	0.13100	14
	High	Low	High	707	0.25500	5
	High	Low	Low	949	0.59200	5
	High	High	High	6974	3.68600	16
	High	High	Low	2550	1.76300	22

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
50x50	Low	Low	High	180	0.01700	3
	Low	Low	Low	1012	0.28300	4
	Low	High	High	899	0.10000	8
	Low	High	Low	1388	0.15100	13
	High	Low	High	460	0.10500	4
	High	Low	Low	893	0.23900	3
	High	High	High	2997	0.83100	12
	High	High	Low	9045	3.45600	20

Appendix A. Microsoft Solver Foundation test results

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
50x100	Low	Low	High	279	0.04400	2
	Low	Low	Low	494	0.08400	5
	Low	High	High	2852	0.44600	10
	Low	High	Low	1804	0.33200	17
	High	Low	High	1225	0.51500	6
	High	Low	Low	2061	1.21200	7
	High	High	High	12016	7.47500	7
	High	High	Low	7813	6.04300	29

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
100x10	Low	Low	High	297	0.02900	2
	Low	Low	Low	265	0.02400	1
	Low	High	High	252	0.02000	1
	Low	High	Low	274	0.02300	2
	High	Low	High	130	0.02300	2
	High	Low	Low	204	0.21500	2
	High	High	High	4584	0.53400	5
	High	High	Low	5214	0.76700	5

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
100x20	Low	Low	High	153	0.01900	2
	Low	Low	Low	419	0.05000	3
	Low	High	High	2503	0.25700	2
	Low	High	Low	1915	0.19700	3
	High	Low	High	2953	0.53200	2
	High	Low	Low	2266	0.67500	3
	High	High	High	13874	2.70000	7
	High	High	Low	17092	3.80200	8

Appendix A. Microsoft Solver Foundation test results

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
100x30	Low	Low	High	24	0.00400	2
	Low	Low	Low	206	0.03000	2
	Low	High	High	1969	0.22500	4
	Low	High	Low	3037	0.37800	7
	High	Low	High	803	0.17300	2
	High	Low	Low	961	0.45900	3
	High	High	High	22495	6.28600	7
	High	High	Low	10212	3.24500	7

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
100x40	Low	Low	High	166	0.02700	1
	Low	Low	Low	1494	0.40600	3
	Low	High	High	3438	0.41300	3
	Low	High	Low	6222	0.90300	7
	High	Low	High	599	0.18000	2
	High	Low	Low	1127	0.37600	5
	High	High	High	25814	8.39100	8
	High	High	Low	19479	6.95700	9

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
100x50	Low	Low	High	422	0.06600	3
	Low	Low	Low	2610	0.56700	2
	Low	High	High	3718	0.50700	5
	Low	High	Low	799	0.11900	4
	High	Low	High	459	0.16400	3
	High	Low	Low	499	0.21300	3
	High	High	High	37315	14.88700	6
	High	High	Low	24361	10.82700	7

Appendix A. Microsoft Solver Foundation test results

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
100x100	Low	Low	High	452	0.11500	2
	Low	Low	Low	2870	0.77400	4
	Low	High	High	18502	4.80200	5
	Low	High	Low	18760	5.52600	8
	High	Low	High	891	0.54000	3
	High	Low	Low	19303	13.82900	6
	High	High	High	81884	70.47700	10
	High	High	Low	147067	161.52500	15

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
200x200	Low	Low	High	3981	2.43900	2
	Low	Low	Low	6515	4.76600	3
	Low	High	High	223500	134.14000	6
	Low	High	Low	86823	59.64300	10
	High	Low	High	6550	9.90700	3
	High	Low	Low	97857	198.71300	4
	High	High	High	2997937	7351.45200	9
	High	High	Low	8441884	26662.04100	11

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
500x500	Low	Low	High	102889	223.04800	2
	Low	Low	Low	*	*	-
	Low	High	High	11871588	65227.62400	6
	Low	High	Low	*	*	-
	High	Low	High	589940	5446.39700	3
	High	Low	Low	**	**	-
	High	High	High	*	*	-
	High	High	Low	**	**	-

Appendix A. Microsoft Solver Foundation test results

Size	Type			Branches	Time (s)	Optimal Value
	Demands	Sparsity	Products			
1000x1000	Low	Low	High	*	*	-
	Low	Low	Low	**	**	-
	Low	High	High	**	**	-
	Low	High	Low	**	**	-
	High	Low	High	**	**	-
	High	Low	Low	**	**	-
	High	High	High	**	**	-
	High	High	Low	**	**	-