COMP2003 Assignment 3 Experimentation
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Results: Figures and Tables

Table 1: 10k Max Budget

Stats\Layout	0	1	2	3	4	5	6	7	8
Expanded Nodes	2	3	7	3541	1065	10000	10000	10000	10000
Generated Nodes	2	3	8	10282	2418	26492	29364	32467	27558
No. of Pegs Left	1	1	1	1	1	4	5	4	6
Expanded/Seconds	83333	96773	95890	149478	139215	161974	151098	148687	122065
Execution Time	0.000019	0.000031	0.000073	0.023689	0.007650	0.061738	0.066182	0.067255	0.081923

Table 2: 100k Max Budget

Stats\Layout	0	1	2	3	4	5	6	7	8
Expanded Nodes	2	3	7	3541	1065	100000	100000	100000	100000
Generated Nodes	2	3	8	10282	2418	359818	374374	386432	349918
No. of Pegs Left	1	1	1	1	1	3	4	2	4
Expanded/Seconds	95238	115384	109375	150456	135703	230345	230205	225194	223473
Execution Time	0.000021	0.000026	0.000074	0.023535	0.007848	0.434130	0.434395	0.444061	0.447481

Table 3: 1M Max Budget

Stats\Layout	0	1	2	3	4	5	6	7	8
Expanded Nodes	2	3	7	3541	1065	1000000	1000000	1000000	1000000
Generated Nodes	2	3	8	10282	2418	4488460	4481227	4790300	4073020
No. of Pegs Left	1	1	1	1	1	2	3	2	4
Expanded/Seconds	86956	120000	100000	146177	136678	265380	270785	255550	286393
Execution Time	0.000023	0.000025	0.000070	0.024224	0.007792	3.768171	3.692958	3.913123	3.491698

Table 4: 1.5M Max Budget

Stats\Layout	0	1	2	3	4	5	6	7	8
Expanded Nodes	2	3	7	3541	1065	1090275	1500000	1500000	1500000
Generated Nodes	2	3	8	10282	2418	4898609	7020662	7173496	6361454
No. of Pegs Left	1	1	1	1	1	1	3	2	4
Expanded/Seconds	105263	107142	84337	143389	139033	264682	245416	259081	284779
Execution Time	0.000019	0.000028	0.000083	0.024695	0.007660	4.119173	6.112053	5.789673	5.267236

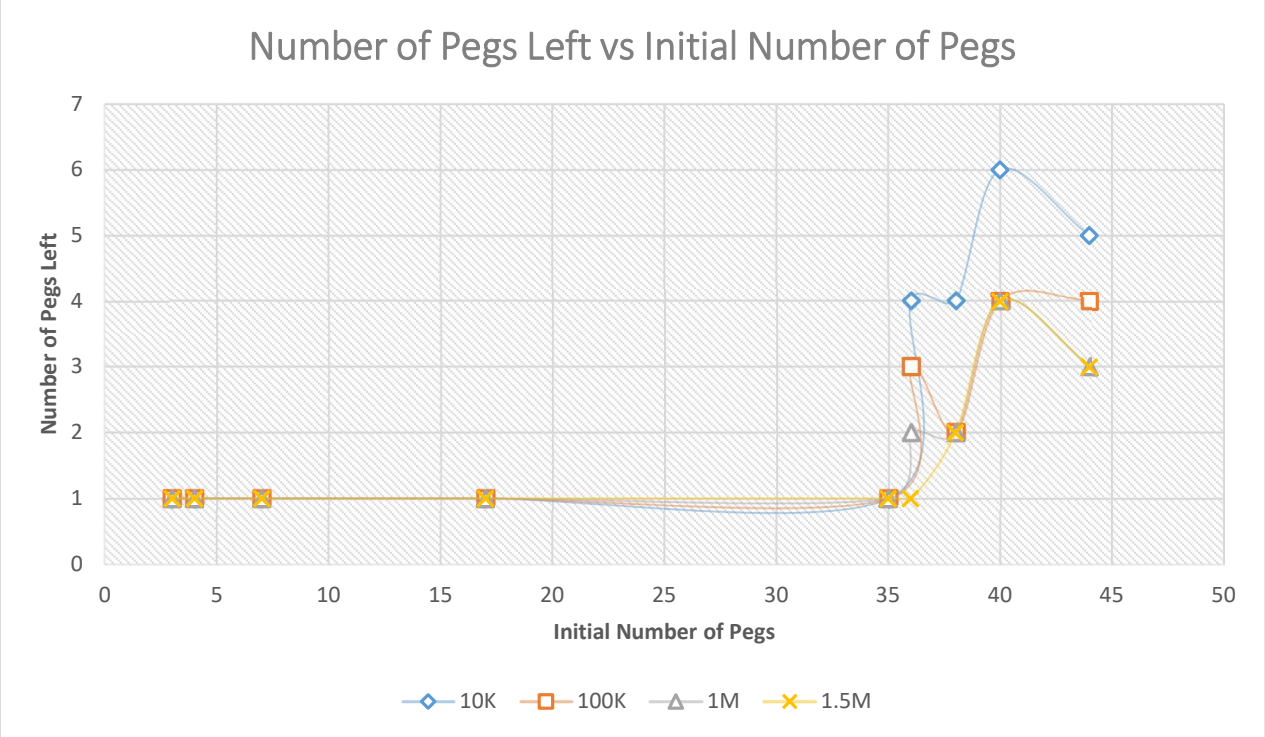

Figure 1. Number of Initial Pegs vs Number of Pegs Left

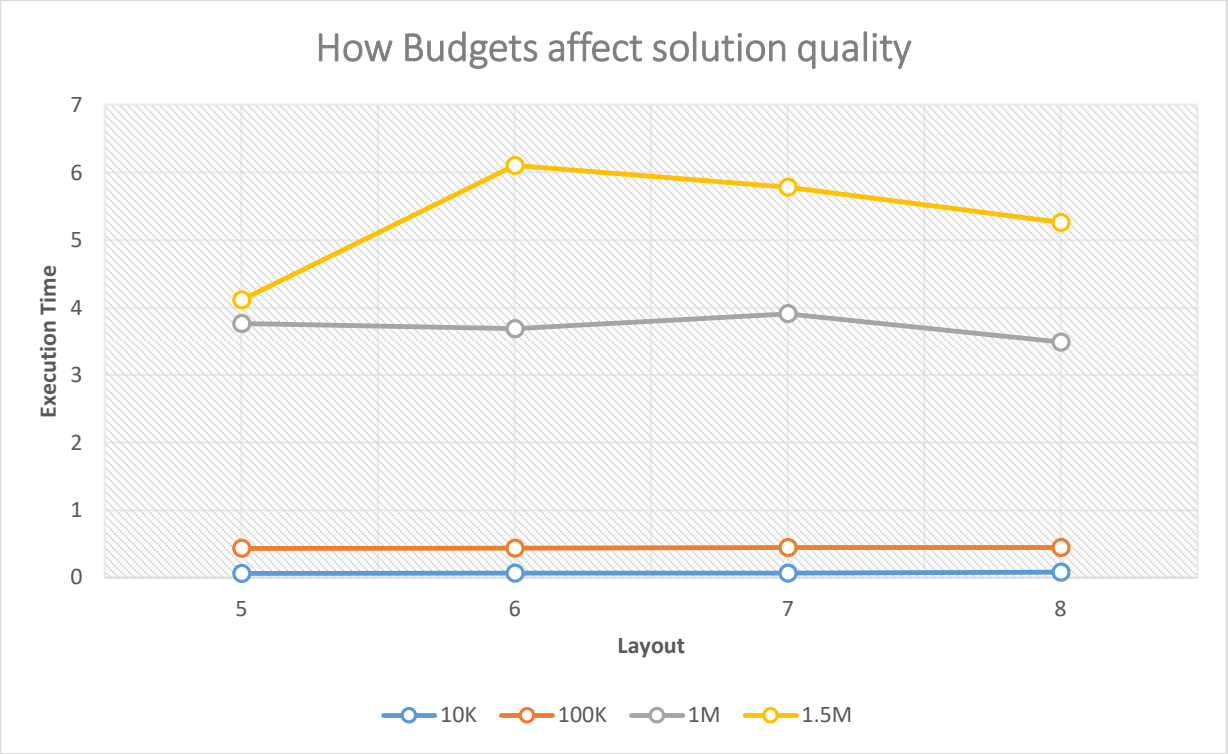

Figure 2. Execution Time vs Layout for each Max Budget

Results: Explanation

Unsurprisingly, the algorithm will take longer as layout gets more complex and has greater quantity of initial pegs. As max budget increases, execution time and expanded nodes per seconds will increase despite reaching solution on early max budgets.
Algorithm on Layout 0 - 4 is successful at all max budgets. The algorithm can solve layout 5 only when reaching 1.5 million max budget nodes. Figure 1 shows the algorithm consistently solves layouts with initial pegs less than 35. It also shows 10K having the most amount of pegs leftover after the ai has run. Figure 2 shows execution time will increase with max budget.
Its predicted that as the layout continues to increase in complexity, to solve the layout, we will need exponentially more possible nodes.