

Lab 1 Part 3
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Depth	BFS		IDS		A*: h1		A*: h2		A*: h3	
	Avg run time	Avg #nodes Explr'	Avg run time	Avg #nodes Explr'	Avg run time	Avg #nodes Explr'	Avg run time	Avg #nodes Explr'	Avg run time	Avg #nodes Explr'
8	11ms	362	22ms	7581	7ms	94	14ms	245	8ms	74
15	132ms	10738	3sec 214ms	94696 92	37ms	1684	80ms	5017	27ms	857
24	851ms	187474	N/A	N/A	638ms	97954	709ms	121551	253ms	25324

Notes

- * All values have been rounded
- * Due to my laptops lack of computing power (or my poor optimization), IDS will not work on 24 solutions

Instructions to Reproduce

1. run main program (Main file)
2. enter file path (e.g. “./puzzles/Part3/L8/166.txt”)
3. enter algorithm (e.g. “h1”)
4. take results from each execution, average, and tabulate them.

Conclusions

At lower depths, the runtime between all different algorithms is negligible. However, as we increase our depth to 24 or even 15, we begin to notice a significant performance discrepancy between the informed and uninformed searches (especially IDS). This disparity between the types of algorithms will only increase as the depth gets increasingly bigger.

As for the average number of nodes explored between the three A* heuristics, it seems that the misplaced tiles (h1) heuristic performs better than the manhattan distance heuristic (h2) which implies that counting misplaced tiles is a more effective approach to gauging how close you are to solving the puzzle. Furthermore, my added heuristic, that weights misplaced tiles (h3) further confirms this.