AI Assignment Report (Coding)

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13CS30021

This is a report on how the runtimes of the algorithms A* and IDA* differ with respect to the heuristic used where the heuristics used are mentioned below. The program is written in Python Language.
The following shows the nodes expanded , time taken for the program to complete under the implementation of the following 3 heuristics :
(a) h(n) = 0
(b) h(n) = the number of misplaced tiles
(c) h(n) = the sum of distances of tiles from their goal positions.
The last heuristic being more accurate and taking less amount of time compared the other two.

The code for the assignment can be found attached in the submission and online here:

Input vs Nodes Expanded & Time Taken(s)												
	A*						IDA*					
Input	h_a	t_a	h_b	t_b	h_c	t_c	h_a	t_a	h_b	t_b	h_c	t_c
[4, 5, 1, 0, 6, 7, 8, 2, 3]	798585	10.241	28178	1.236	2327	.678	722160	15.499	158949	1.308	10491	1.002
[4, 3, 1, 0, 7, 6, 2, 5, 8]	23619	3 3.567	10332	1.046	876	1.076	201643	5.544	50448	1.172	5210	1.012
[1, 0, 2, 3, 4, 5, 6, 7, 8]	1	1.017	1	1.002	1	1.04	4	1.755	1	1.191	1	0 .674
[1, 4, 0, 3, 7, 2, 6, 8, 5]	51	0.953	6	1.053	11	1.018	525	.616	11	.762	44	.989
[2, 6, 1, 0, 7, 5, 4, 8, 3]	708585	10.841	29262	2.517	2700	.83	5255279	12.126	119845	2.759	14194	0.859

The above data is for 5 inputs. The100 test cases that the program was run on can be found in the input line of the code submitted itself.

Code runtime: All the prompts have been put into the code itself so you'll be able to see any choices that you might need to do on runtime.

All that is needed is:

e_name>.py

file_name here is the name of the file that has been extracted or downloaded from the internet.