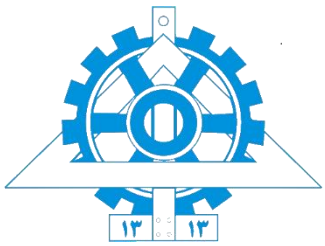

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Home Work 1

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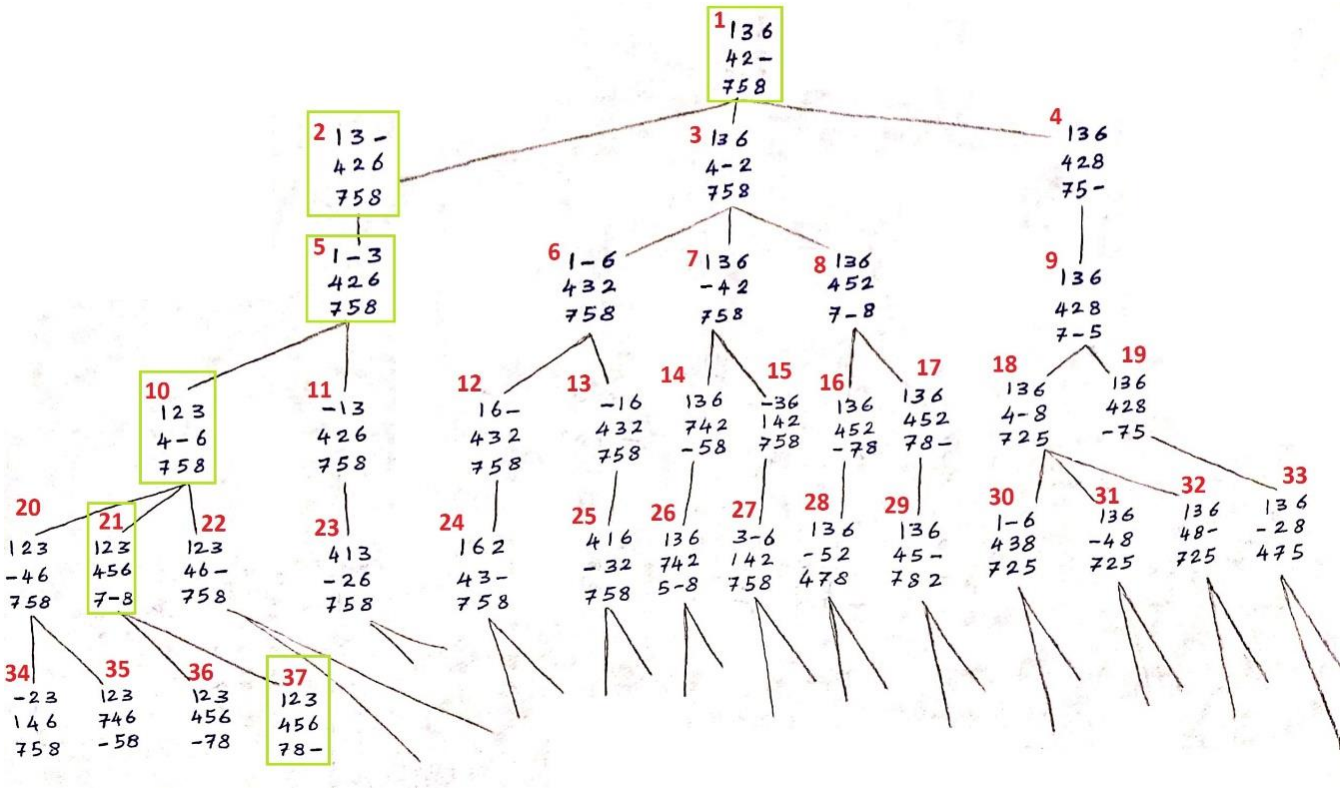
1. Breadth-First Search (BFS)

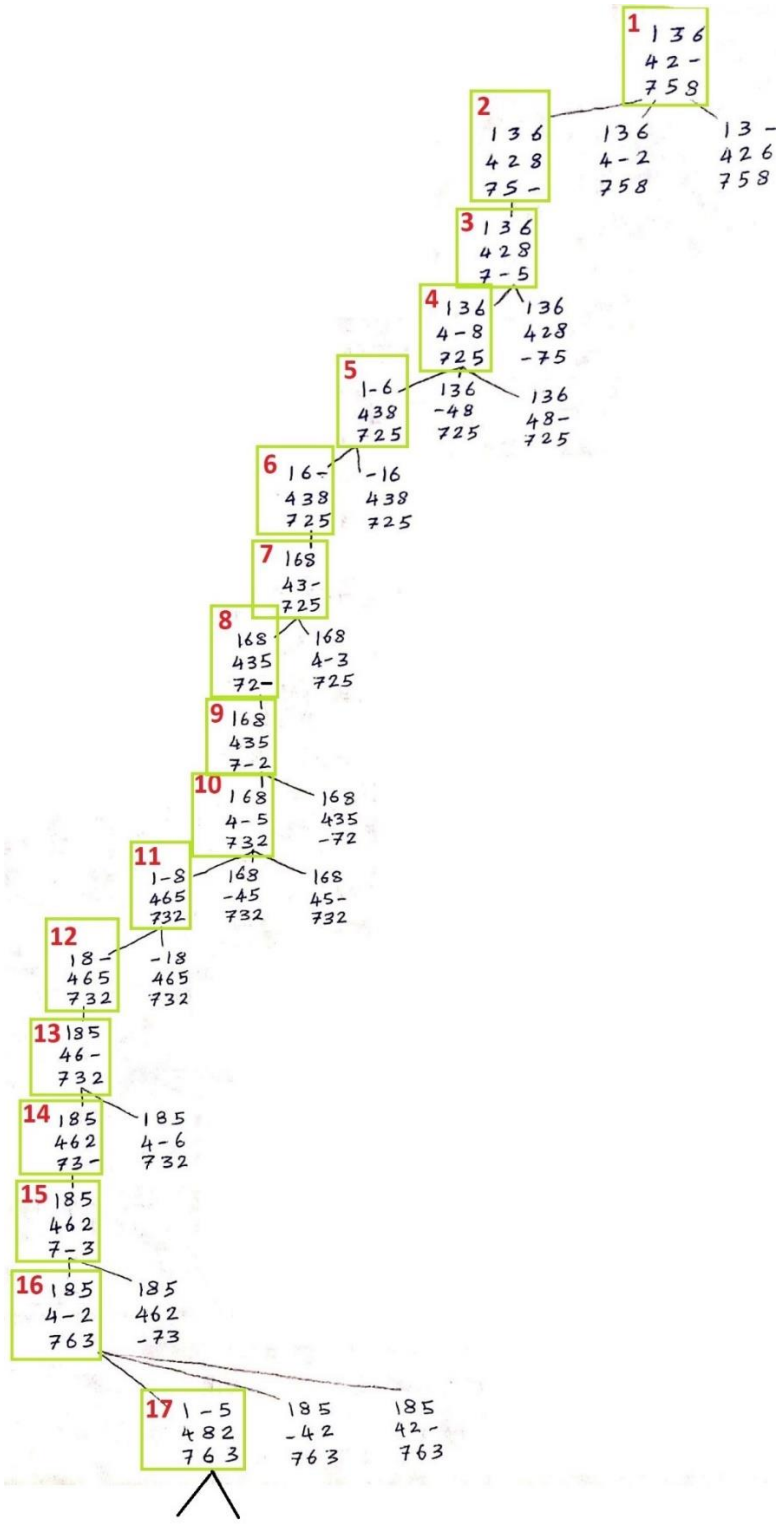
As you can see through the following graph for BFS algorithm, the number of steps for solving an 8-sliding puzzle with an initial state of 13642-758 and a goal state of 12345678- is 37 and the depth of search is 5.

Note: **A python code has been used to verify that the following results which are manually calculated on the paper, are correct.**

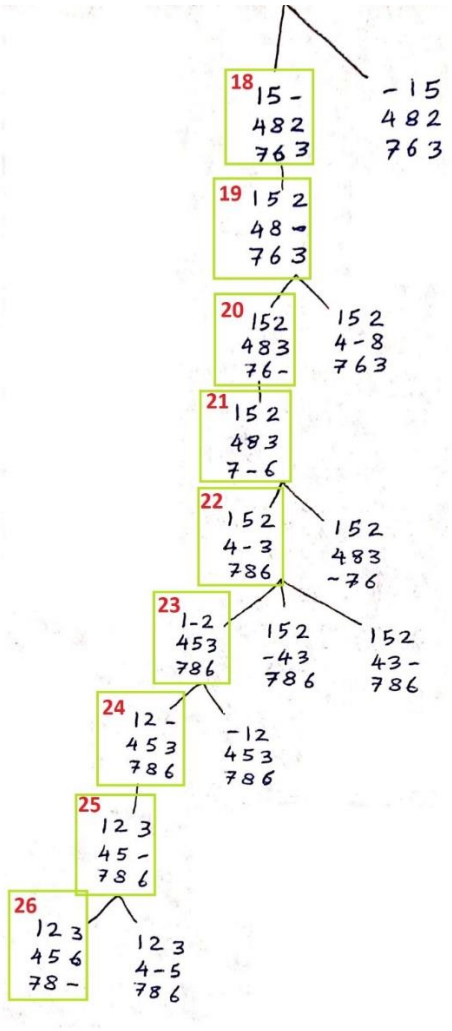


2. Depth-First Search (DFS)

As you can see through the following graph for DFS algorithm, the number of steps for solving an 8-sliding puzzle with an initial state of 13642-758 and a goal state of 12345678- is 26 and the depth of search is 25.



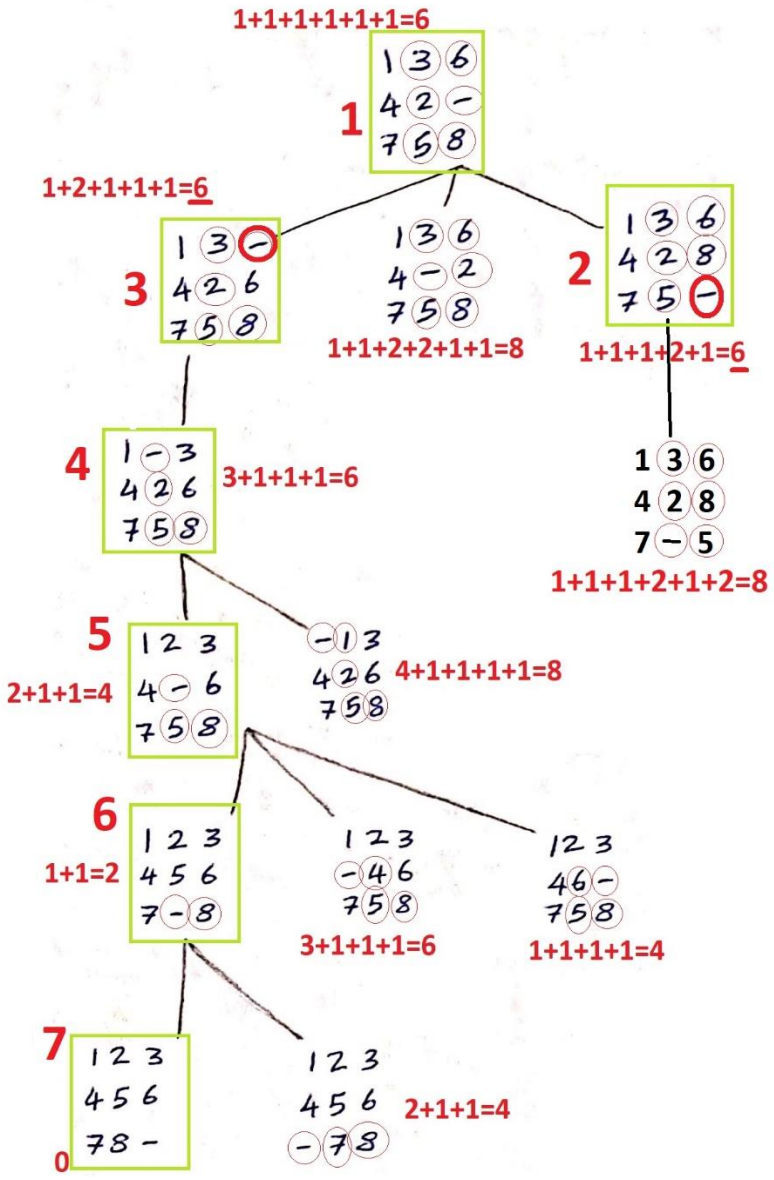
Continuation of the previous graph:



3. Greedy-Best First Search

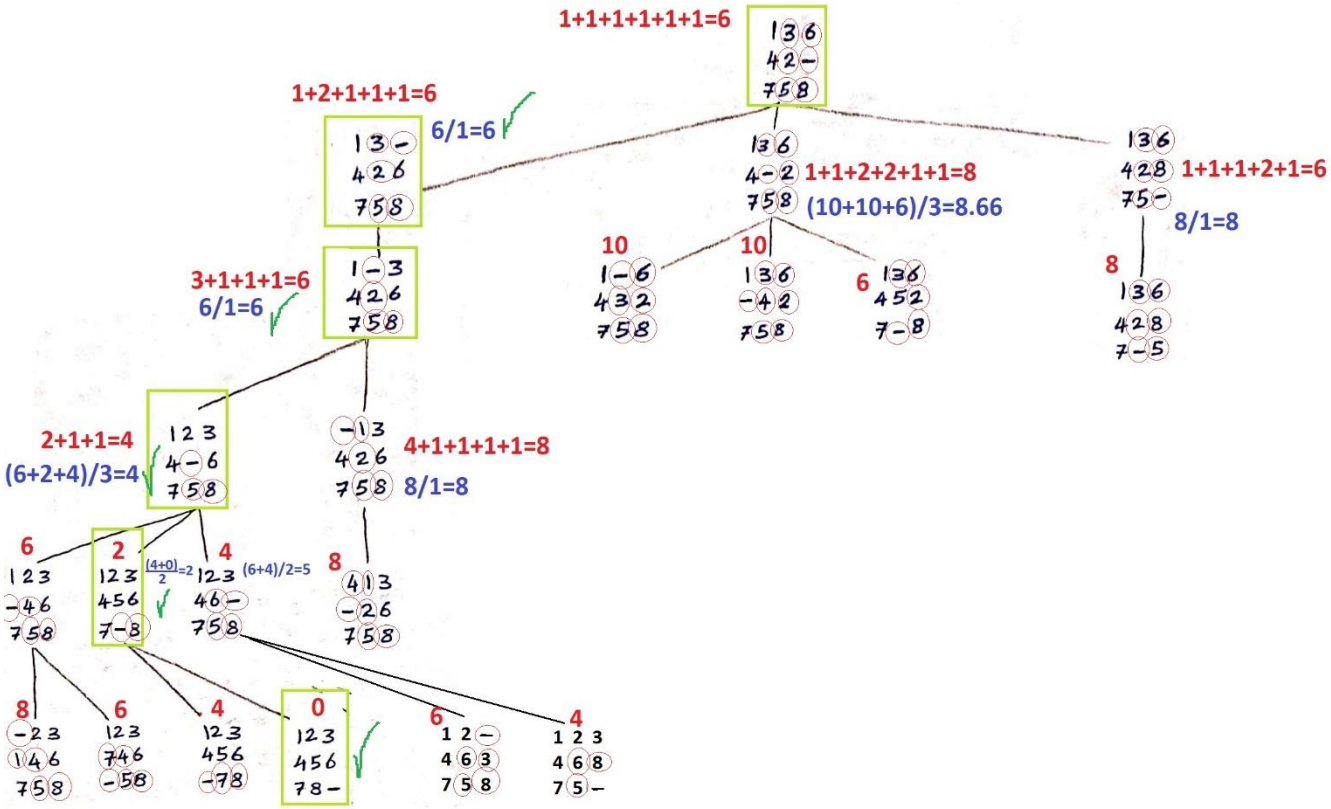
As you can see through the following graph for Greedy-Best First Search algorithm, the number of steps for solving an 8-sliding puzzle with an initial state of 13642-758 and a goal state of 12345678- is 7 and the depth of search is 5.

Note: **After step 1, there are two choices with identical costs of 6, but the state is selected in which the empty number (--) has been placed in the lower row.**



4. A* Search

As you can see through the following graph for A* Search algorithm, the number of steps for solving an 8-sliding puzzle with an initial state of 13642-758 and a goal state of 12345678- is 6 and the depth of search is 5.



5. Conclusion

No.	Algorithm	Depth	Steps
1	Breadth-First Search	5	37
2	Depth-First Search	25	26
3	Greedy-Best First Search	5	7
4	A* Search	5	**6**

So, as you can see through the Table, we will have fewer steps by using **A*** search algorithm for solving this 8-sliding puzzle.

Thanks for your Time