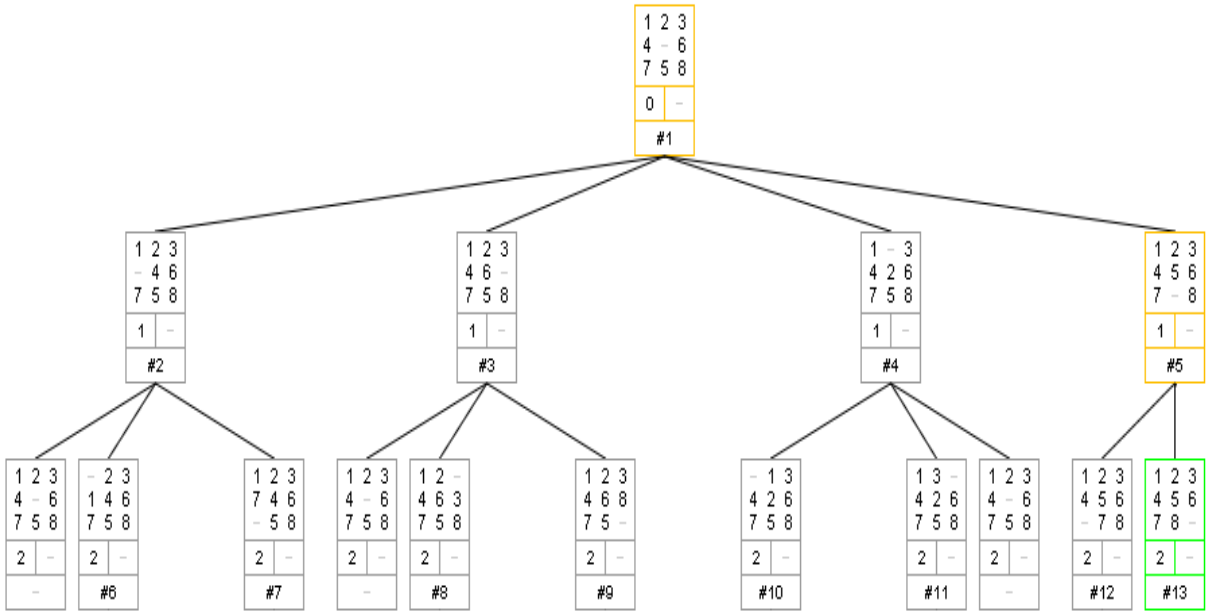
1.

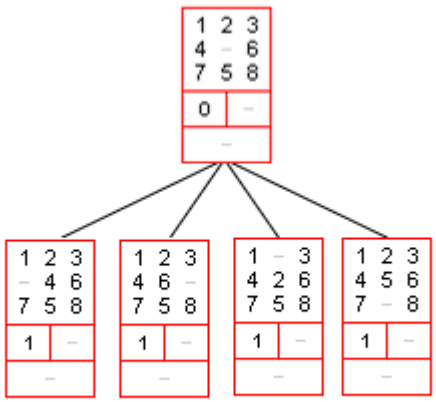
a)



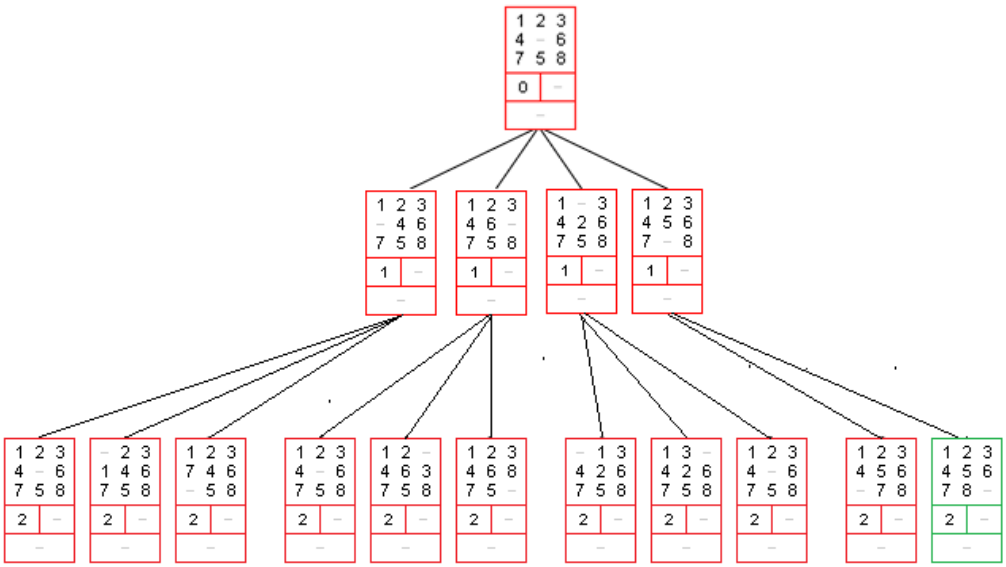
b)

limit = 0:

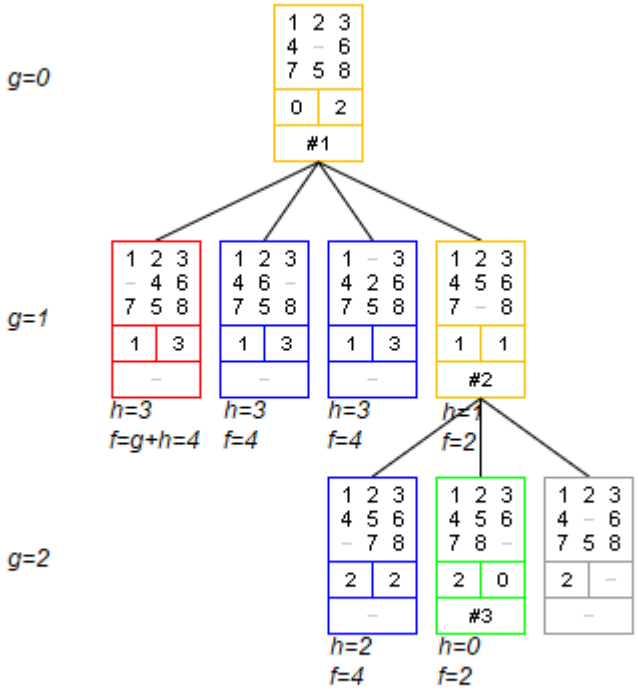
limit = 1:



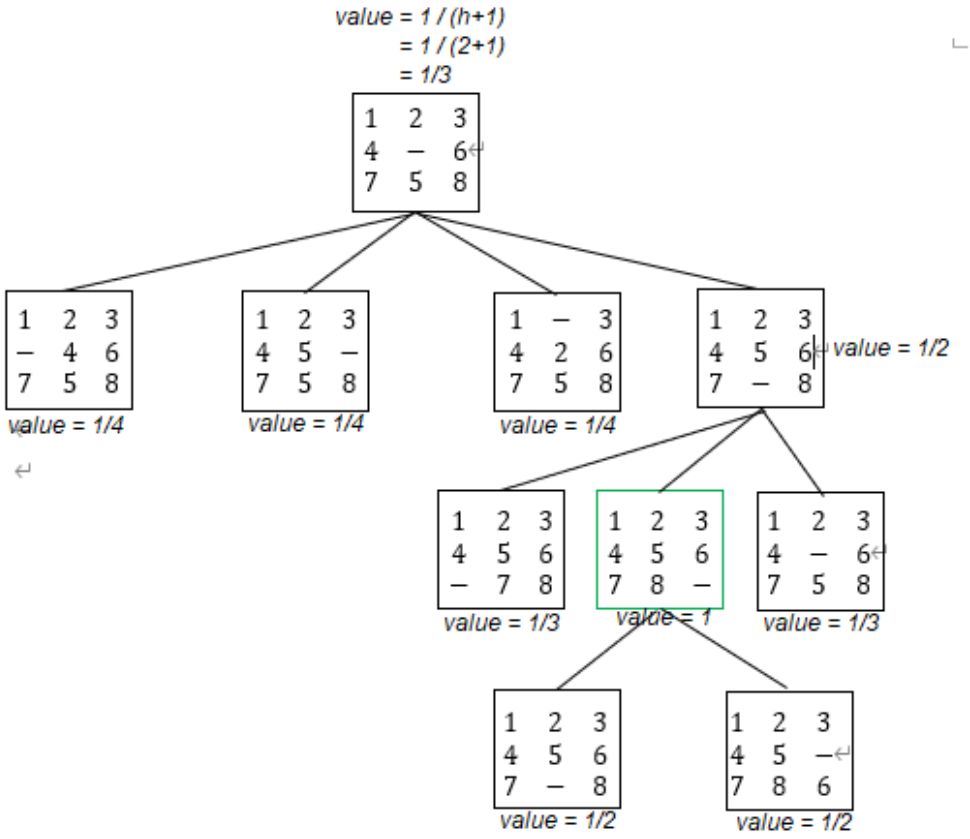
limit = 2:



c)



d)



3.

a)

(CityBlockDistance – 1) is not an admissible heuristic for the 8-puzzle problem. (CityBlockDistance – 1) may cause h to be 0. A 0 means that there may be a sub-optimal solution. In other words, using (CityBlockDistance – 1) may overestimate the cost of achieving the expected goal. For example, if the goal state is $\begin{matrix}1&2&3\\4&5&6\\7&8&-\end{matrix}$, The state $\begin{matrix}1&2&3\\4&5&6\\7&-&8\end{matrix}$ and the state $\begin{matrix}1&2&3\\4&6&5\\7&8&-\end{matrix}$ will have the same h=0. In fact, the cost of achieving the goal in these two states is not the same.

b)

(CityBlockDistance + 1) is an admissible heuristic for the 8-puzzle problem. (CityBlockDistance +1) will not cause problems such as overestimation or loop. It can make the tile move closer to the goal every time.