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FA17-BSE-081

# 8 Puzzle Problem

$f(N) = g(N) + h(N)$

$g(N)$: Depth of node N

$h(N)$: No of tiles

| | | |
|---|---|---|
| 2 | 8 | 3 |
| 1 | 6 | 4 |
| 7 | | 5 |

initial state

| | | |
|---|---|---|
| 1 | 2 | 3 |
| 8 | | 4 |
| 7 | 6 | 5 |

Final state

h = ? heuristic value = ?

misplace = 4


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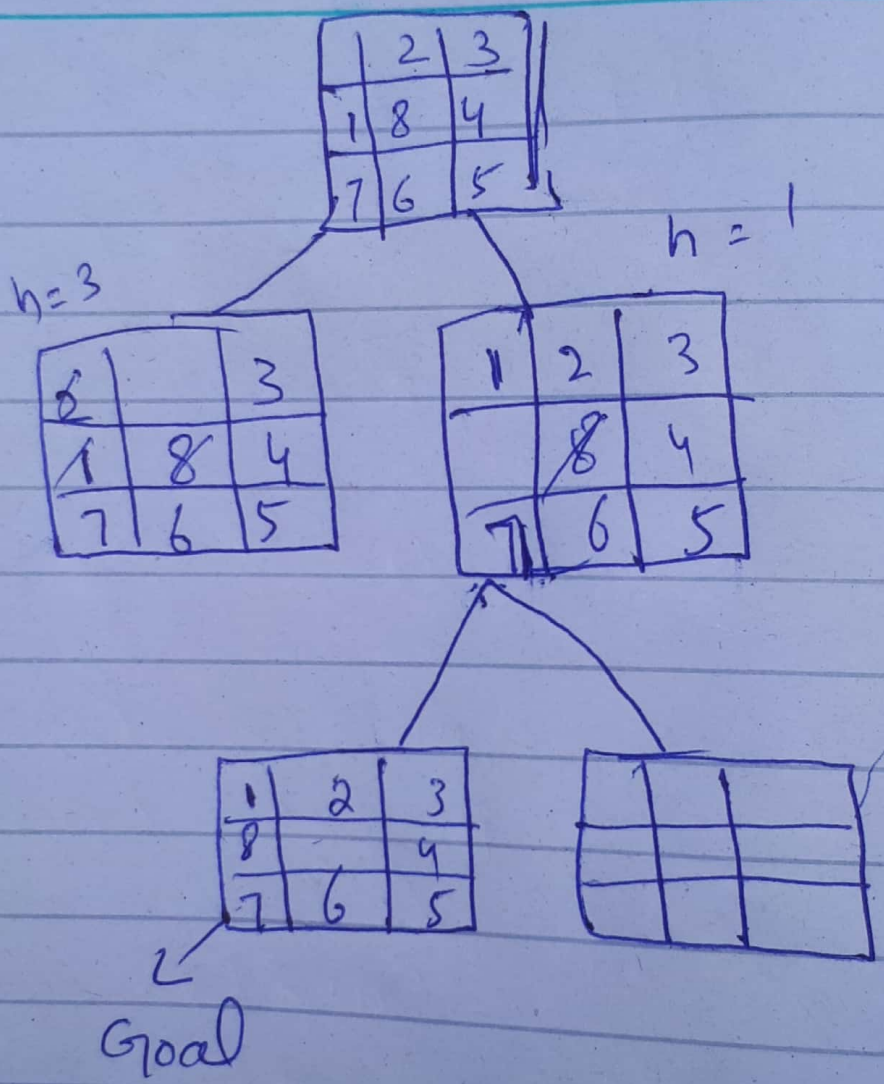
Goal

| | | |
|---|---|---|
| 1 | 2 | 3 |
| 8 | | 4 |
| 7 | 6 | 5 |

h=2




Deapth = 6

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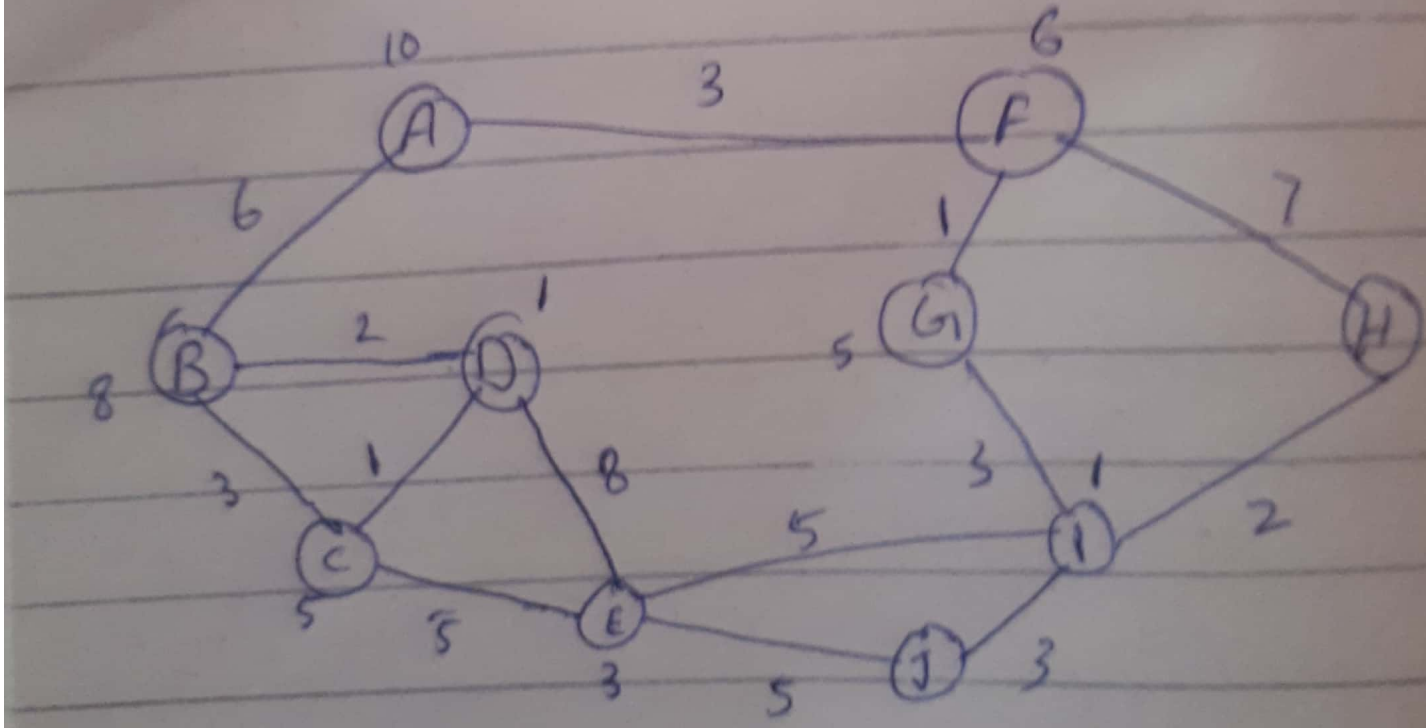
Actual cost
$g \to n$

$f(N) = g(N) + h(N)$ — estimated / heuristic




formula is $f(N) = g(N) + h(N)$

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Solution

Step: 1

We start node 'A'

→ Node B & F can be called for Node A

→ f(B) = 6 + 8 = 14

f(F) = 3 + 6 = 9

Since f(F) < f(B)

then go to F node

P(A→F)

Step 2

N(G) & N(H) coded for N(F)

f(G) = (8+1) + 5 = 9

f(H) ⇒ (8+7) + 3 = 13

f(G) < f(H)

taking f(G)

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P(A → F → G)

**Step 3**

N(I) can be reached N(G)

f(I) = (3+1+3) ≠ 8

go to the Node I

P(A, F, G, I)

**Step 4**

N(E) N(H) & N(J) can be reached N(I)

f(E) = (3+1+3+5) ≠ 3 = 15

f(H) = (3+1+3+2) +3 = 12

f(I) = (3+1+3+3) ≠ 0 = 10

Since f(J) is least so decide go to Node J

P(A, F → G, I, J)

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P( A → F → G → I → J )

This is the required shortest path from node A to node J

P