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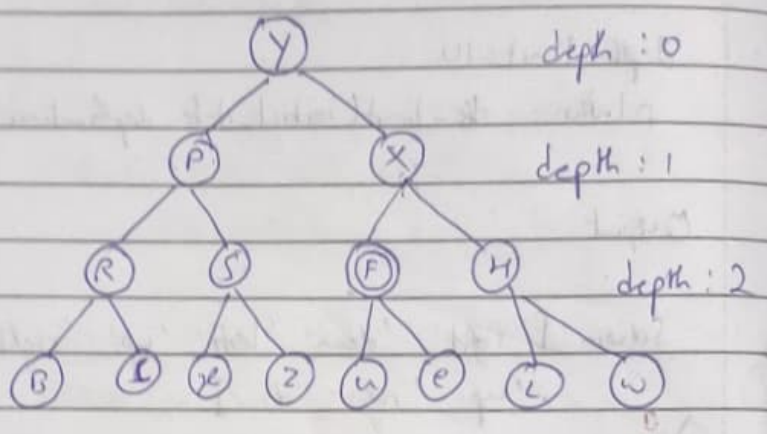
Lab-4

Iterative deepening search algorithm



Step 1 : Print the root node

Y

Step 2 : Print the children of the root node

Y — Goal : Not found depth : 0

Y P X — Goal : Not found depth : 1

Y P R S X F H — Goal : Found depth : 2

~~Y P R B I J S Z X F W E H L W~~

Return F

1 + 2 + 1 + 4 = 2

Using A*, 8 puzzle problem

Initial state			Goal state		
1	2	3	2	8	1
8	0	4	0	4	3
7	6	5	7	6	5

The blank space can move in 4 direction which is 2, 8, 6, 4

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when moved to 2

1	0	3
8	2	4
7	6	5

Heuristic distance = 2 + 2 + 1 + 1 + 0 + 0 + 2
= 8

when moved to 8

1	2	3
0	8	4
7	6	5

distance = 2 + 1 + 1 + 1 + 0 + 0 + 0 + 1
= 6

we know $f(n) = g(n) + h(n)$
$h(n)$ = no. of displaced tiles / heuristic distance
$g(n)$ = depth of node

initially

$h(n) = 7$
$g(n) = 0$
$f(n) = 0 + 7 = 7$

after 1st move

1	2	3
0	8	4
7	6	5

$h(n) = 6$
$g(n) = 1$
$f(n) = 1 + 6 = 7$

after 2nd move

1	2	3
8	4	0
7	6	5

$h(n) = 6$
$g(n) = 1$
$f(n) = 6 + 1 = 7$

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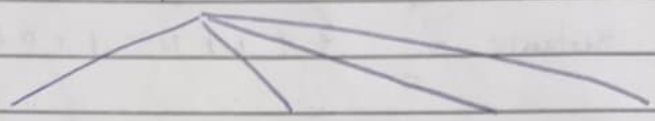
after 3rd move

1 0 3
8 2 4
7 6 5

h(n) = 8
g(n) = 1
f(n) = 9

2 8 1
0 4 3
7 6 5

1 2 3
8 0 4
7 6 5

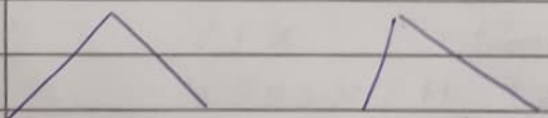


1 2 3
0 8 4
7 6 5
h(n) = 6
g(n) = 1
f(n) = 7

1 2 3
8 4 0
7 6 5
h(n) = 6
g(n) = 1
f(n) = 7

1 2 3
8 6 4
7 0 5
h(n) = 8

1 0 3
8 2 4
7 6 5



0 2 3
1 8 4
7 6 5
h(n) = 7
g(n) = 2

1 2 3
7 8 4
0 6 5
h(n) = 7
g(n) = 2

1 2 0
8 4 3
7 6 5
h(n) = 5
g(n) = 2

1 2 3
8 4 5
7 6 0
h(n) = 7
g(n) = 2

h(n) = 4
8 2 2
0 4 3
7 6 5

1 0 2
8 4 3
7 6 5
h(n) = 6

0 1 2
8 4 3
7 6 5
h(n) = 5

8 1 2
4 0 3
7 6 5
h(n) = 5

8 1 2
7 4 3
0 6 5
h(n) = 5