Assignment - 1A

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Class: BE/IT

Roll No: 73

Subject: IS LAB

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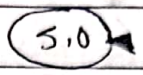
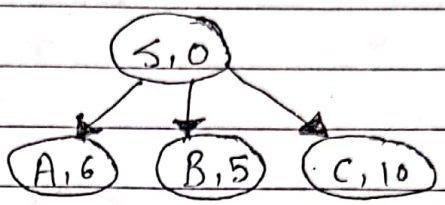
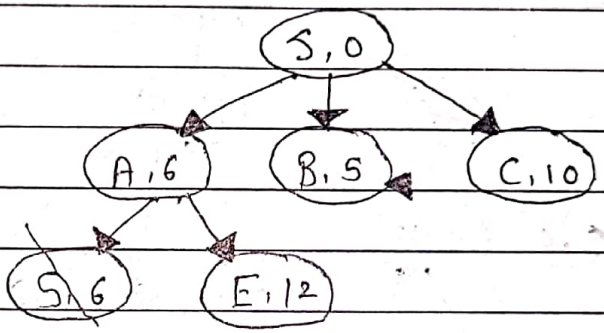
Step 0 :



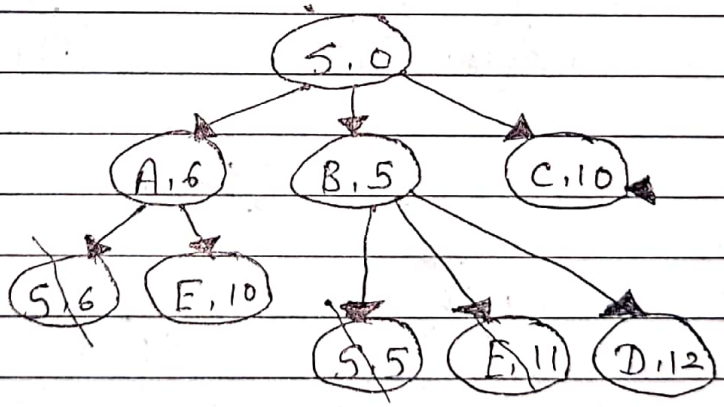
Step 1 :



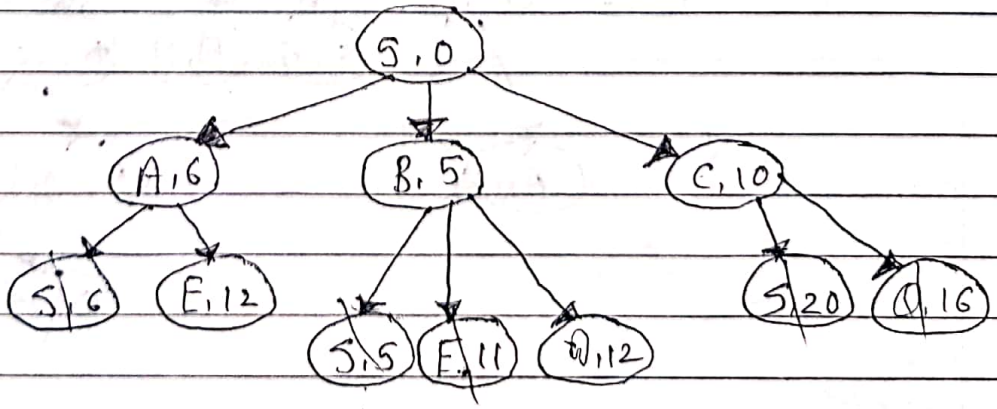
Step 2 :



Step 3 :



Step 4 :



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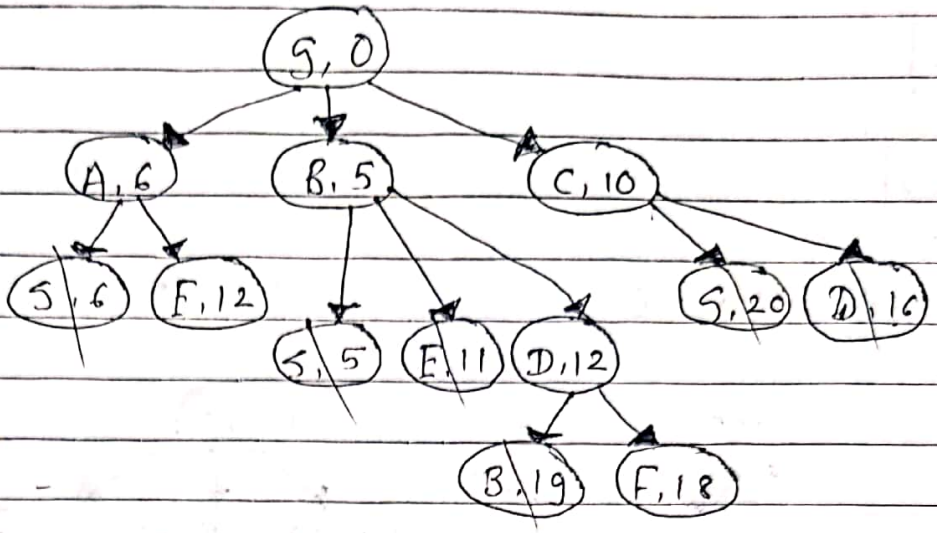
Step 5 :



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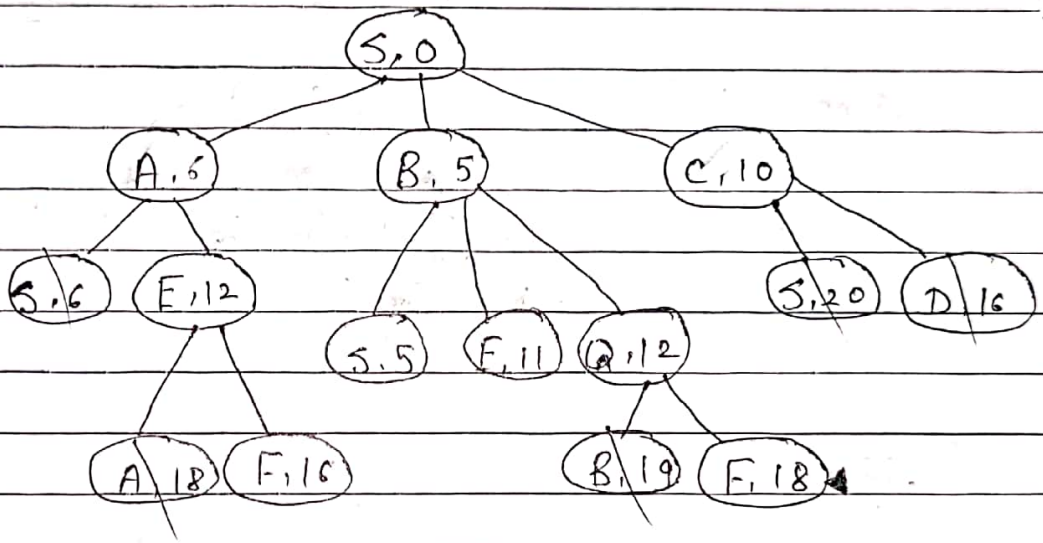

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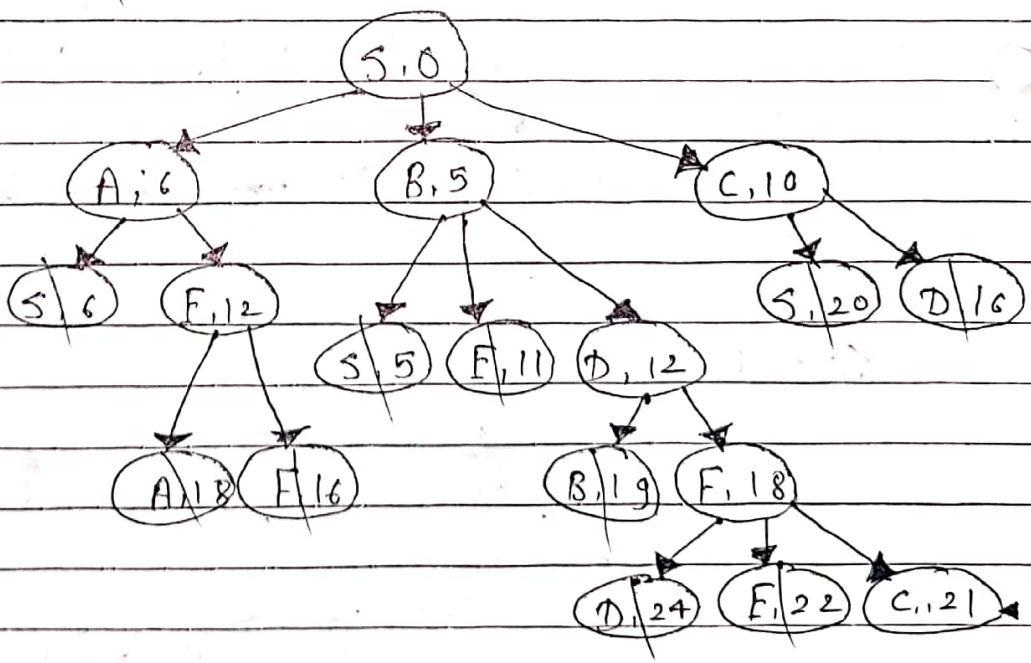

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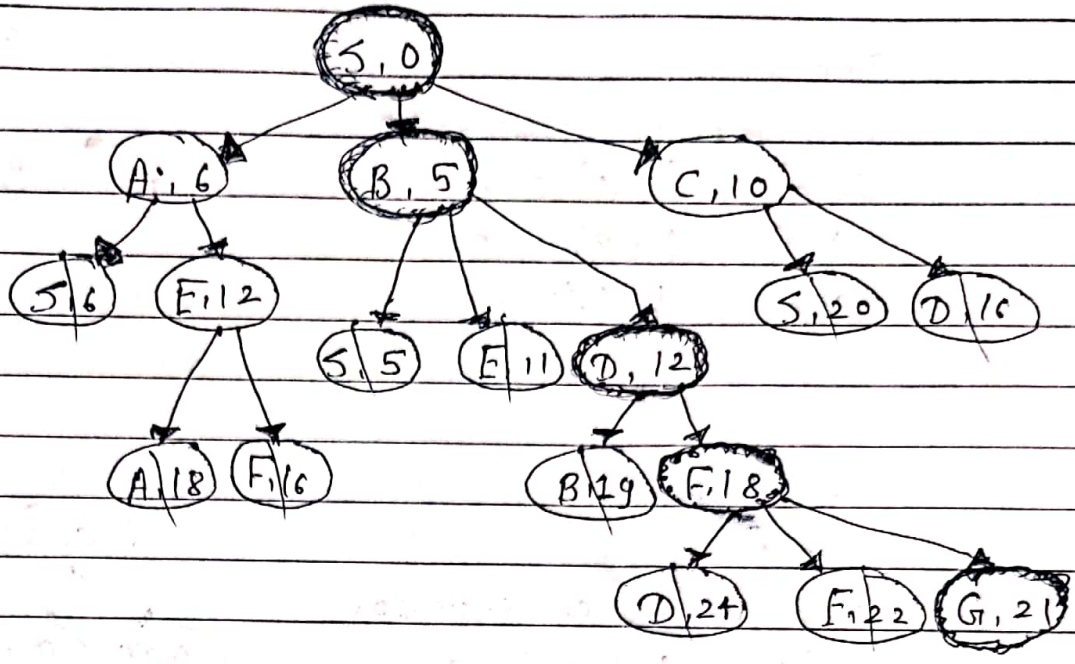
Step 8:



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Initialization: Compute f score for S & put it in the openlist

F- score S : $f(s) = h(s) = 17$

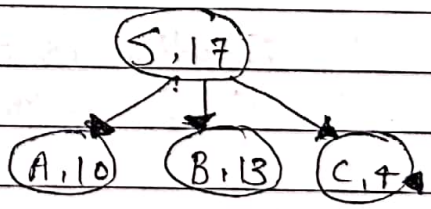
Step 1:

F- Score of Successors

$f(A) = h(A) = 10$

$f(B) = h(B) = 13$

$f(c) = h(c) = 4$

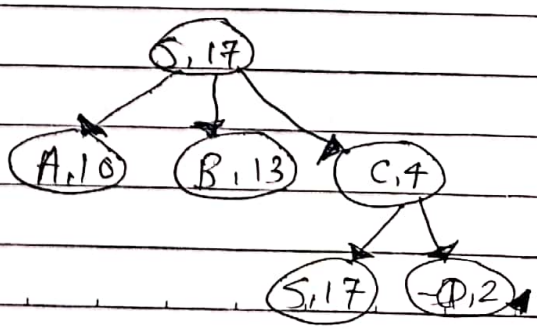


Step 2:

F- Score of Successors

$f(s) = h(s) = 17$

$f(@) = h(@) = 2$



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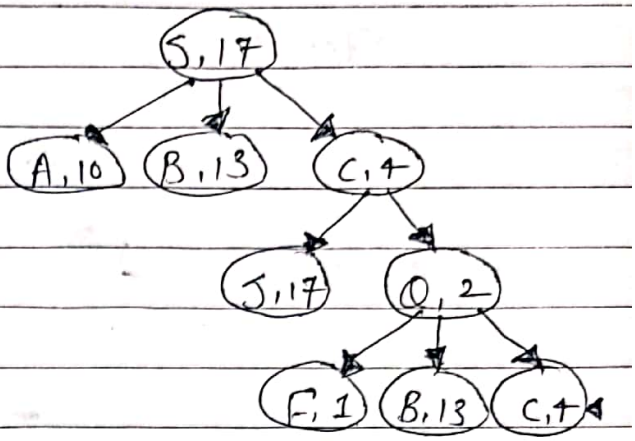
Step 3 :

F - Score of Successor

$f(c) = h(c) = 4$

$f(B) = h(B) = 13$

$f(F) = h(F) = 1$



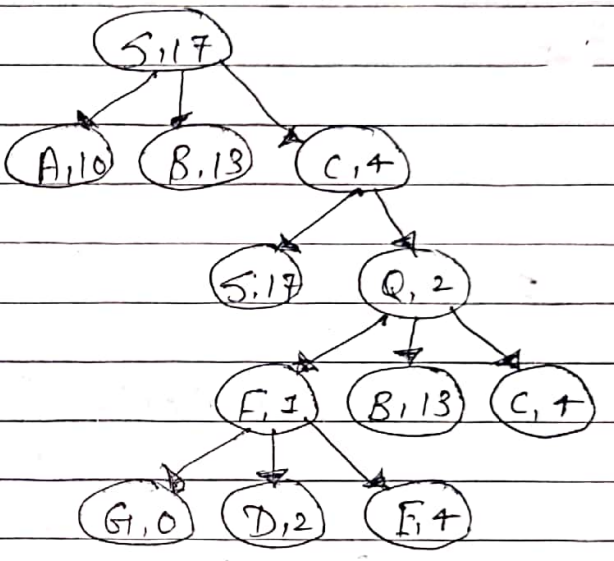
Step 4 :

F - Score of Successor

$F(Q) = h(Q) = 2$

$f(E) = h(E) = 4$

$f(4) = h(4) = 0$



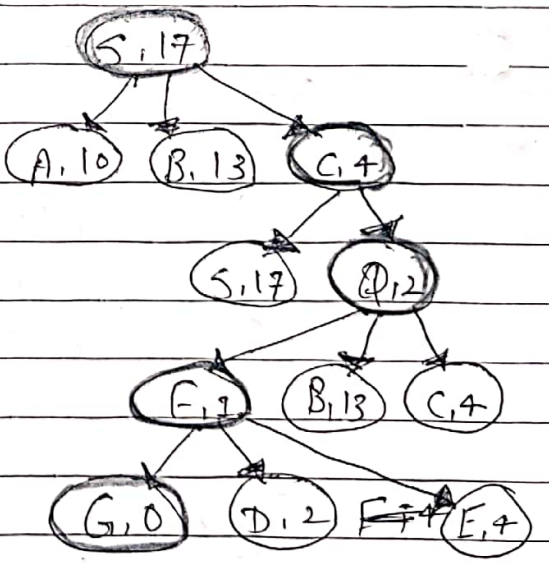
Step 5 :

Solution is -

S → C → D → F → G with

Solution cost : 10 + 6 + 6 + 3

= 25



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The lowest path cost g(n) can be the cost to reach the goal configuration in least steps.

In our case, we can reach the final configuration in at least 4 moves: UP, UP, LEFT, LEFT.

Since all moves are equally costly, we compute g(n) as

$$g(n) = 1 + 1 + 1 + 1$$
$$g(n) = 4$$

Consider the foll. 8-puzzle instance:

8	7	6
2	1	5
-	3	4

Solution can be represented as:

{{8,7,6}{2,1,5}{-,3,4}} → {{8,7,6}{2,1,5},{3,-,4}} → {{8,7,6}{2,1,5}{3,4,-}} → {{8,7,6}{2,1,-},{3,4,5}} → {{8,7,-}{2,1,5}{3,4,5}} → {{8,-,7}{2,1,6}{3,4,5}} → {{-,8,7},{2,1,6},{3,4,5}}

Since all the moves are equally costly the cost would be

$$g(n) = 6$$

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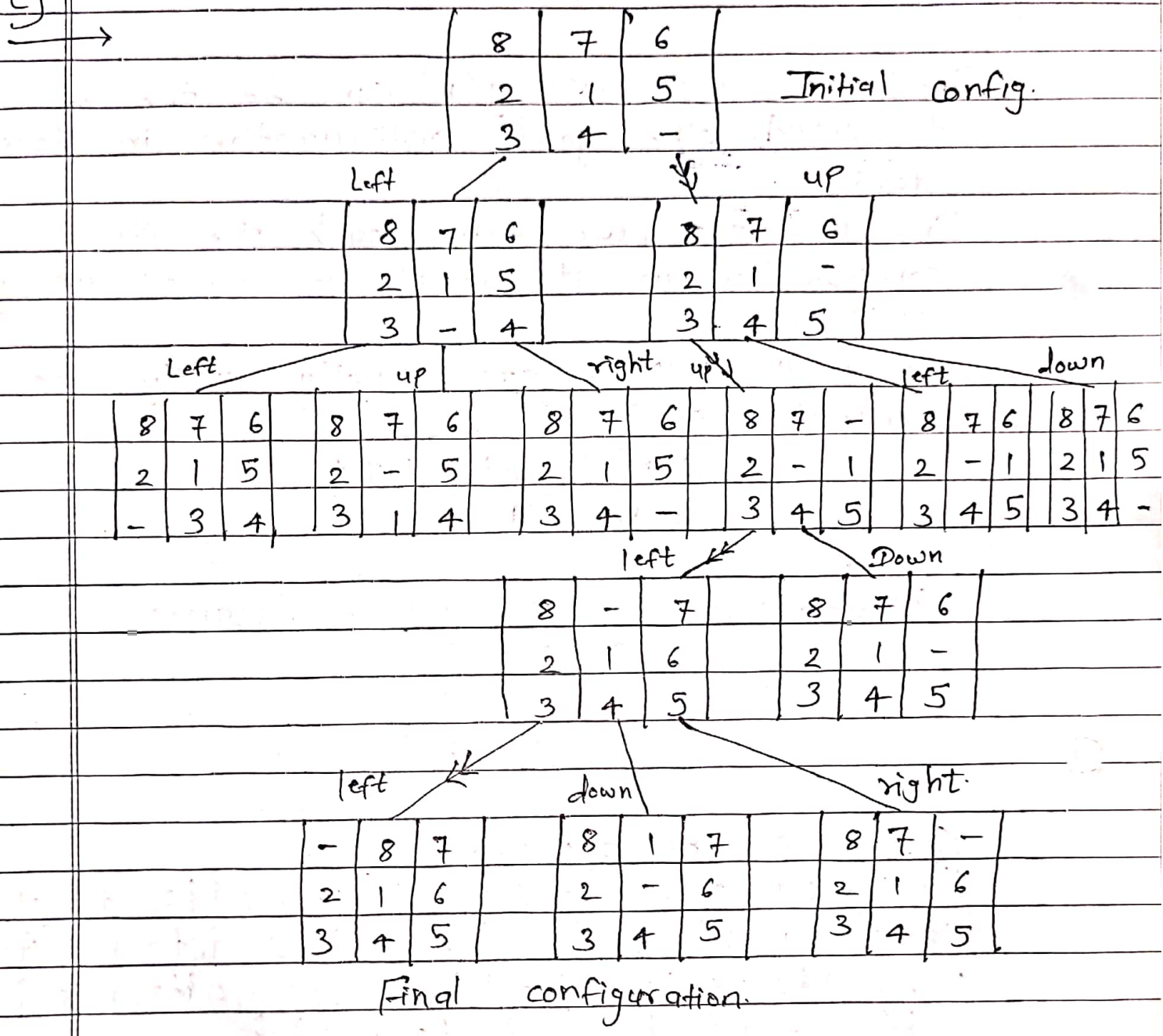
5. path :

c)



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For i = 1 , n = initial state

h_1 (initial) = Misplaced tiles count except space

h_1 (initial) = 4

n = goal state

h_1 (goal) = 0

For i = 2, n = initial state

h_2 (initial) = Correctly explored files count except space

h_2 (initial) = 4

For n = goal state

h_2 (goal) = 8

For i = 3 , n = initial state

h_3 (initial) = Sum of translation dist. between current & correct position of all files except space.

h_3 (initial) = 0 + 0 + 0 + 0 + 1 + 1 + 1 + 1

= 4

For n = goal State

h_3 (goal) = 0.