K.G.C.E.
Karjat - Raigad

Assignment - 1 (A)

Page No. :
Date :

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Name :- Shweta. G. Bhoir

Class :- BE/IT

Roll No :- 09

Subject :- IS Lab

DOA	DOC	Remark	Sign

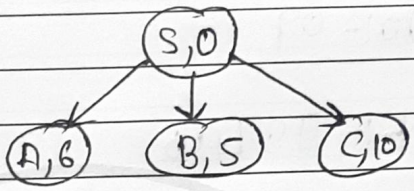
Assignment - 1(A)

Q.1

1.1 →

Step 0 :

Step 1 :



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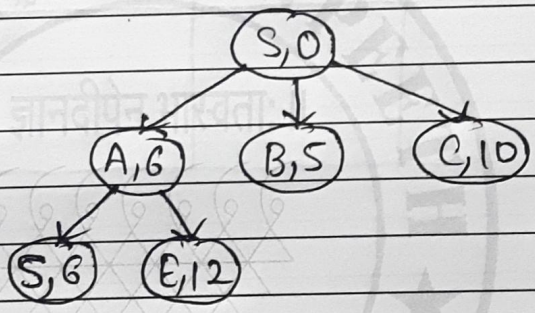

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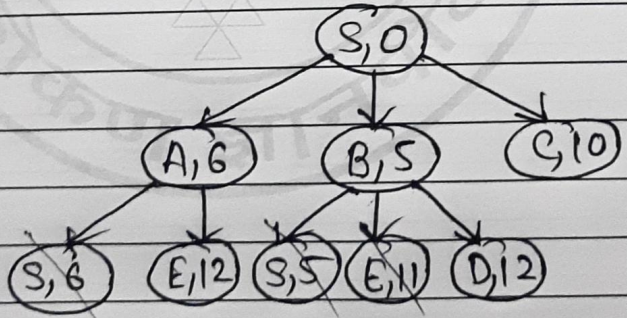

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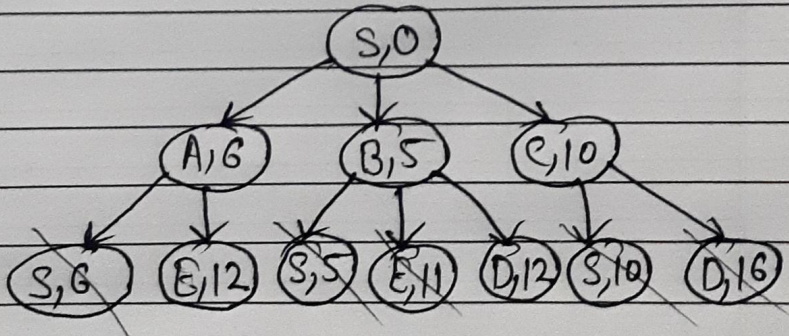

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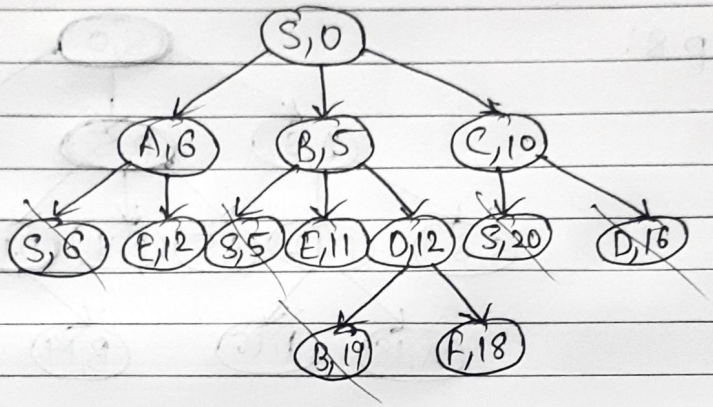

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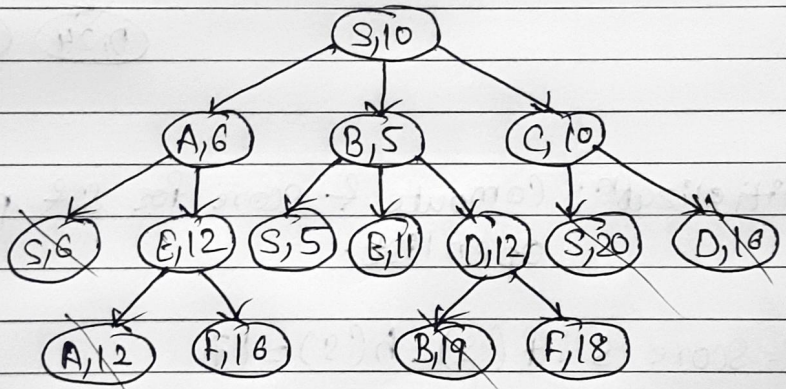

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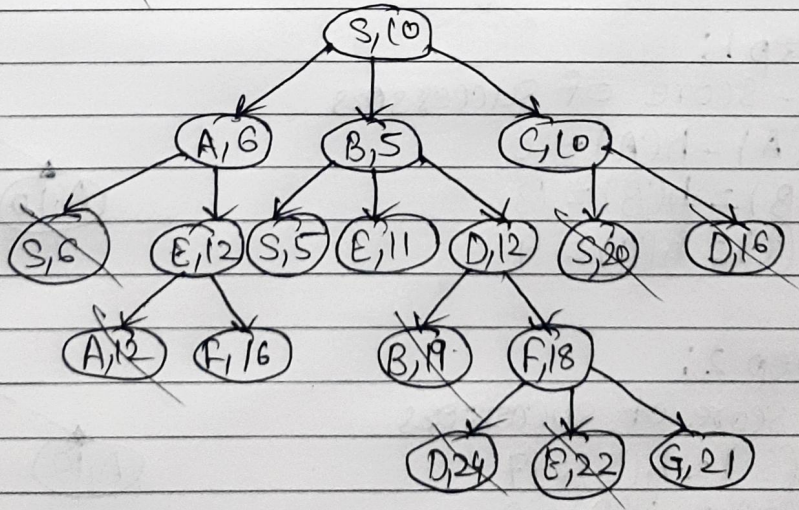
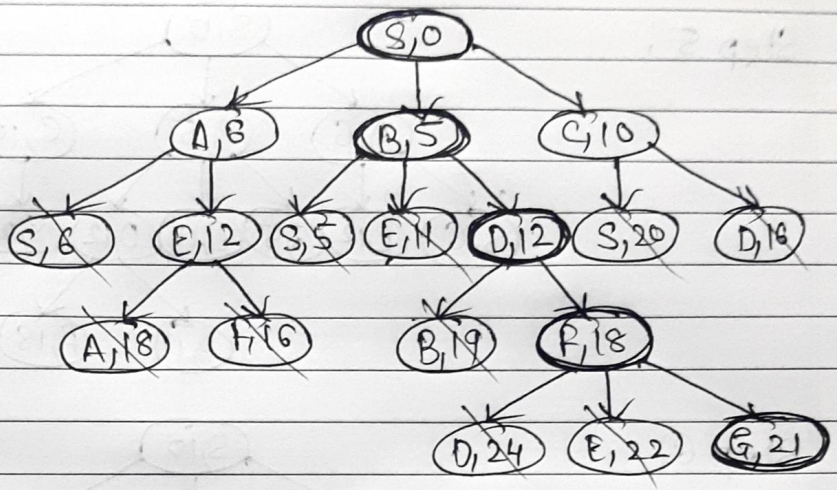


Step 8:

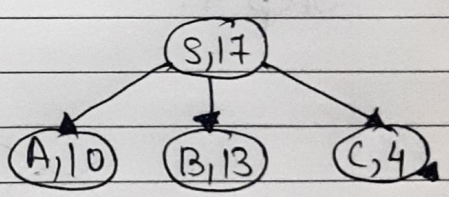


1.4 →

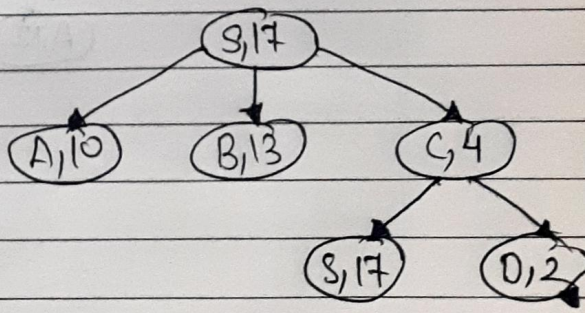
Initialization: Compute f score for S & put it in the open list.

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

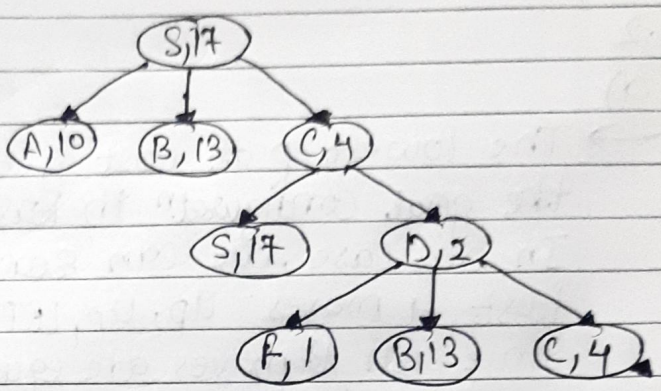
Step 1:
f - score of successors
$f(A) = h(A) = 10$
$f(B) = h(B) = 13$
$f(C) = h(C) = 4$



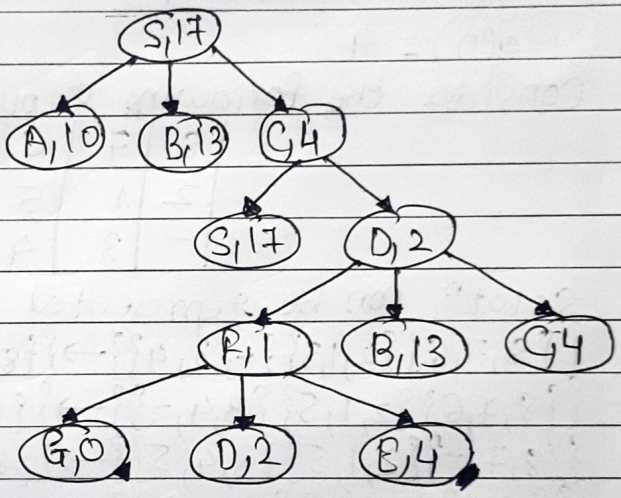
Step 2:
f-score of successors
$f(S) = h(S) = 17$
$f(D) = h(D) = 2$



Step 3:
F - Score of successor
f(C) = h(C) = 4
f(B) = h(B) = 13
f(f) = h(f) = 1

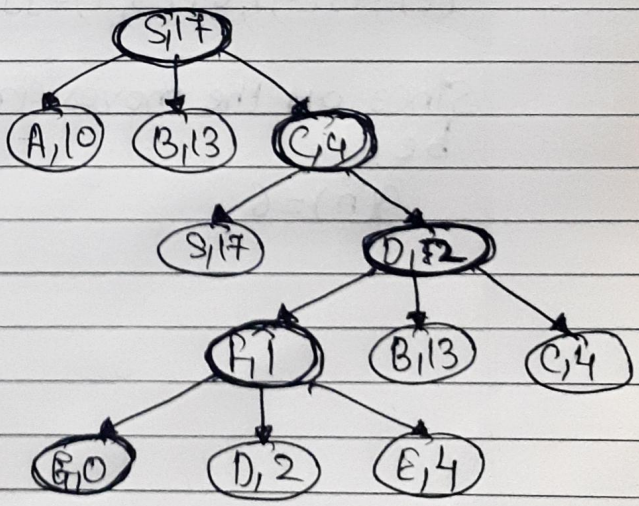


Step 4:
F-Score of successor
f(D) = h(D) = 2
f(E) = h(E) = 4
f(G) = h(G) = 0



Step 5:
Soln is
S → C → D → F → G with

Soln cost: 10+6+6+3
= 25



Q.2

a)

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

In our case, we can reach the final configuratn 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 following 8-puzzle instance

8	7	6
2	1	5
-	3	4

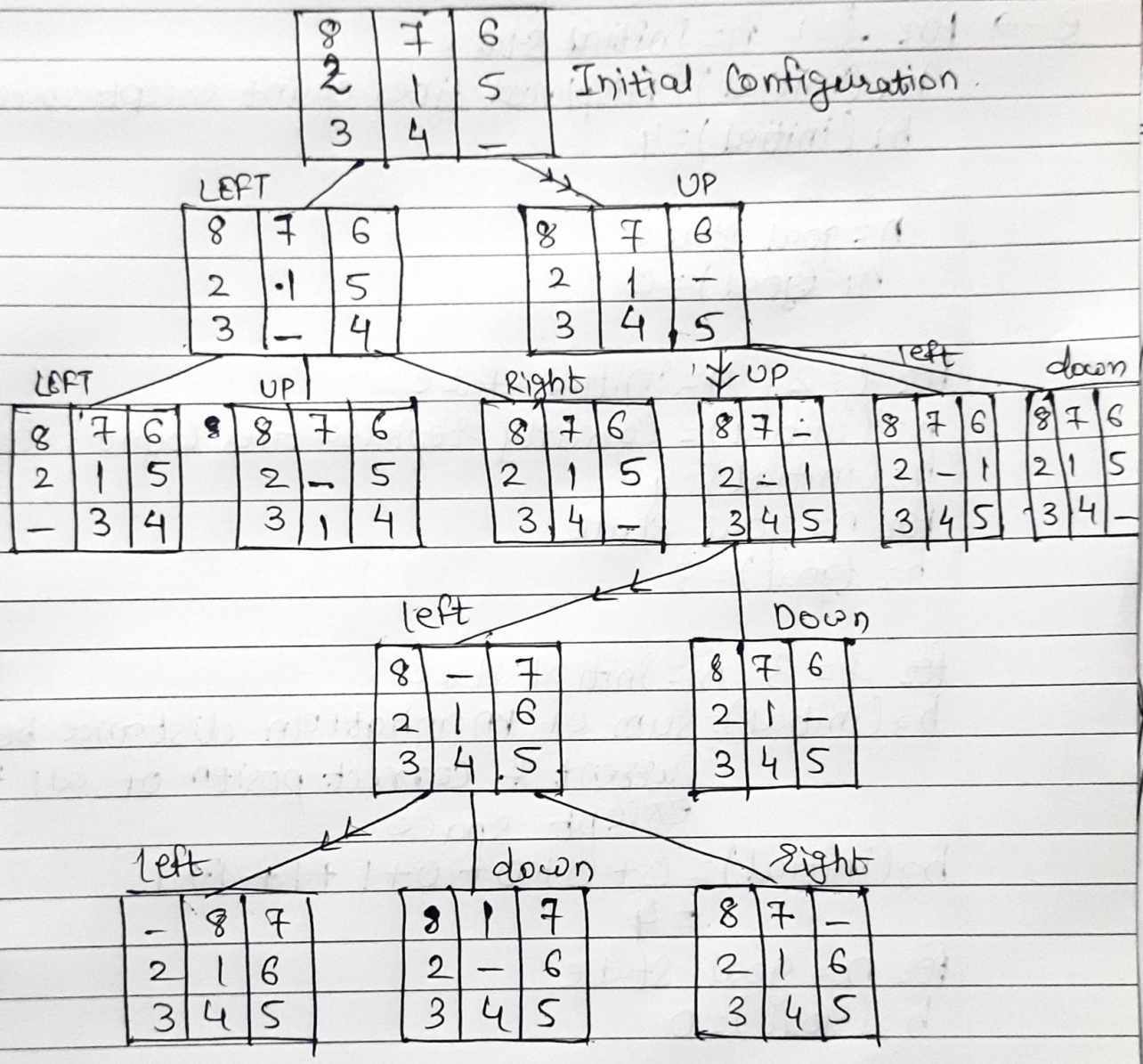
Solutn can be represented as:

{{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

$g(n) = 6$

C→



Final Configuration

e → 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 replaced tiles 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 manhatten distance between Current & correct posith of all tiles except space

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

= 4

for n = goal state

h_3(goal) = 0.