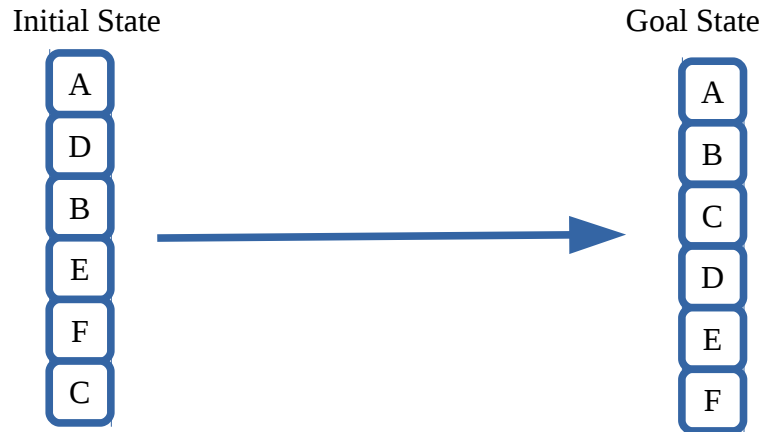


Assignment 1 (Repeaters)
Last Date for Submission: 14/05/2018
Full Marks: 15

- Solve the following block world problem using hill climbing algorithm.



Note: Only show each step that is taken and the value of the heuristic function.

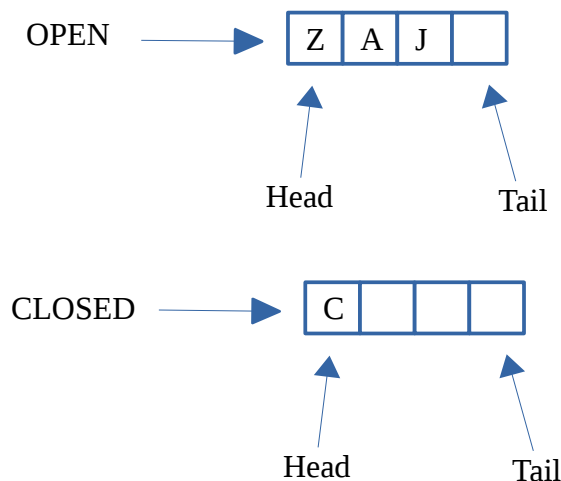
Where,

$h'(x) = +1$ for all blocks in the support structure if a block (b) is correctly positioned*
 -1 for all blocks in the support structure if a block (b) is not correctly positioned*

* if ALL blocks below considered block (b) are correct.

[Note: Refer to slide 6 in Heuristic Search]

- Let the current OPEN (PriorityQueue) and CLOSED lists of an A*-algorithm be



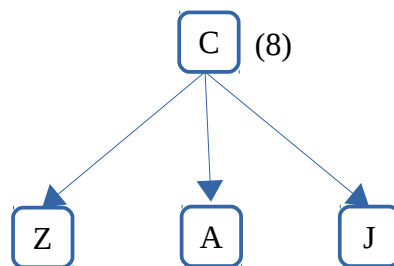
Show the next two steps* of the algorithm by

- Writing down the OPEN and CLOSED list for each new step.
- Calculating the **f'** and **parent link** of new nodes [as well as for the already generated Z, A and J]
- Changing **f'** and **parent link** if necessary of any node that has already been generated.

Note: * Each step considers a **single** element in the OPEN list to expand.

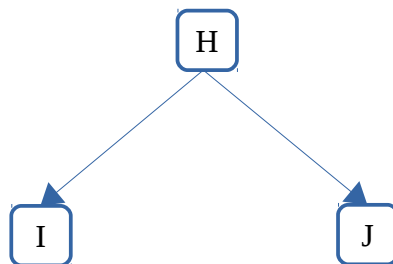
Given,

- Current search state is

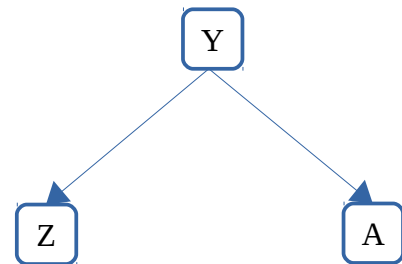


* The value within the brackets () is the heuristic value of node C [$h'(C)$]

- Every node (Except C) expands to two children which correspond to the next two letters of the parent node (cycles to first letter if next two letters go past 'Z').
 - Examples:



Example: 1



Example: 2

- $h'(node) = [f(node) + 6] \% 26$
- $f(node)$ = position of the node letter in the english alphabet starting from 0 (i.e., A = 0, B = 1, C = 2,...).
- Example:
 - $h'(C) = [f(C) + 6] \% 26$
 $= [2 + 6] \% 26 = 8 \% 26 = 8$

Note: Please read A*-Algorithm from slide 25 onwards.