Machine, Data and Learning
Assignment 2

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1. → States : Possible states can be various permutations of blocks and block stacks on the table.
eg. [A, B, C] , [A B C]

→ actions : An action is to take a block that is not under another and move it to a new location.

→ Initial state can be any of the possible states.
eg. [A C B D]

→ goal test : For example testing the goal state for S=[A B] can be
S[0] == A and S[1] == B

→ Path cost : Every action can be assigned a cost of K.

2. Initial state = [C A B]

final state = [A B C]

// assuming the table is only wide enough for 3 blocks.

BFS

iteration 1

[C A B, A B C, A B C]

iter 2:

[A B C, A B C, A B C, C B A, C B A, C A B]

iter 3

[A B C, A B C, C B A, C B A, C A B, C A B]

DFS

Iteration

1: [C A B, A B C, A B C]

2:

2: [A B C, C A B, C B A, C B A, C A B, A B C]

3: [C A B, A B C, C A B, C B A, C B A, A B C]

Uniform Cost

iteration:

1: [C A B, A B C, A B C]

2: [A B C, A B C, A B C, C B A, C A B, C A B]

3: [A B C, A B C, C B A, C B A, C A B, C A B]

3. → One possible heuristic is the measure the absolute difference in toward width of the state and goal.

Eg.

S = [A B C], goal = [A / B / C]

width = 3, width = 1

widthDiff(S) = |3 − 1| = 2

→ Another heuristic is to count the number of blocks that are at the wrong height.

Eg.

S = [A BC] goal = [A / B / C]

only BC is at the right height

correctHeight (S) = 1