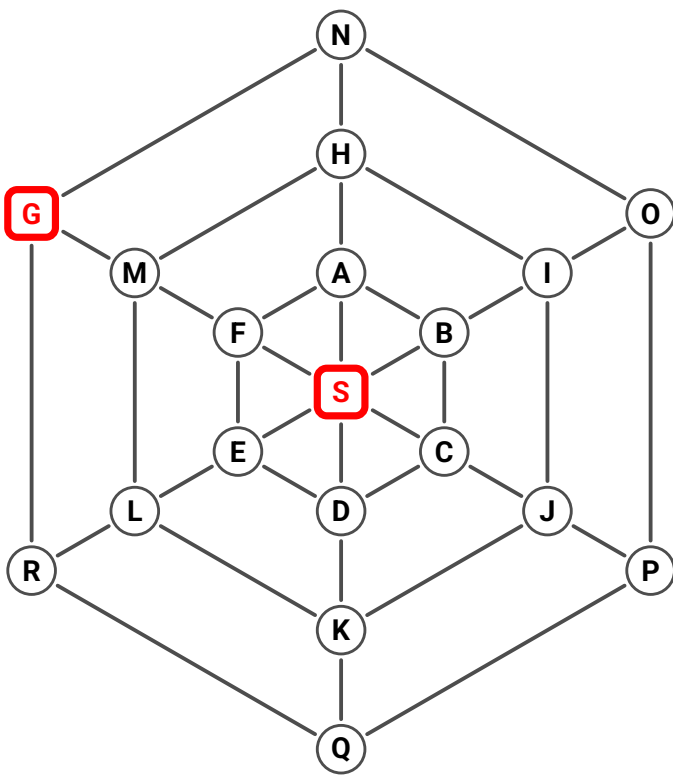


Problem 7

Depth First Search

Prepared by S. Baskaran

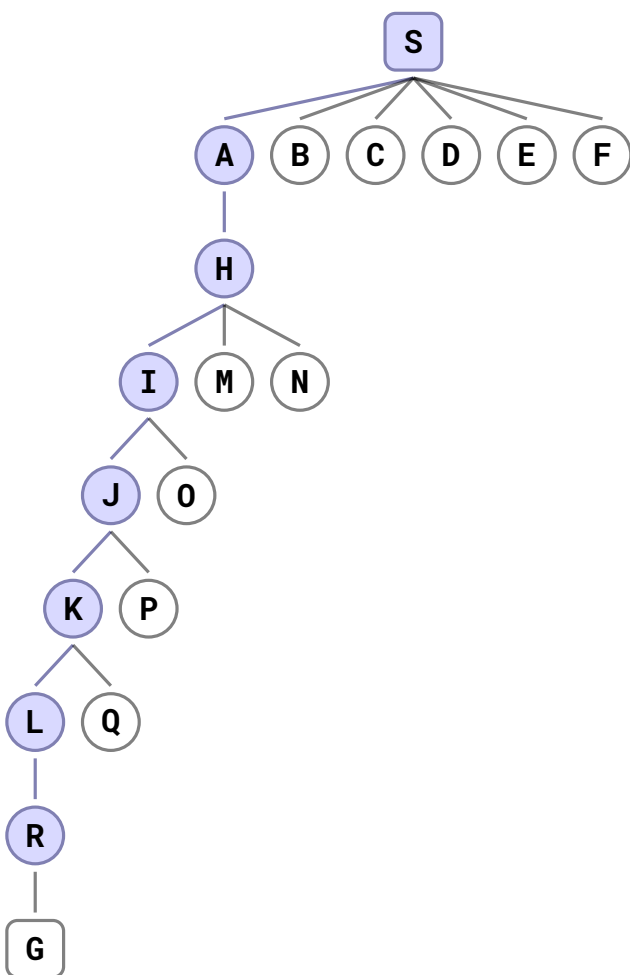
State Space



MoveGen returns nodes in ALPHABETICAL order.

S -> A, B, C, D, E, F
A -> B, F, H, S
B -> A, C, I, S
C -> B, D, J, S
D -> C, E, K, S
E -> D, F, L, S
F -> A, E, M, S
H -> A, I, M, N
I -> B, H, J, O
J -> C, I, K, P
K -> D, J, L, Q
L -> E, K, M, R
M -> F, G, H, L
N -> G, H, O
O -> I, N, P
P -> J, O, Q
Q -> K, P, R
R -> G, L, Q
G -> M, N, R

Depth First Search – Search Tree



Depth First Search – Solution

OPEN and CLOSED carry pairs: (NODE,PARENT)

OPEN (S,null):[]
CLOSED []

1.
NODE S
close (S,null)
moveGen A:B:C:D:E:F:[]
newNodes A:B:C:D:E:F:[]
newPairs (A,S):(B,S):(C,S):(D,S):(E,S):(F,S):[]

OPEN (A,S):(B,S):(C,S):(D,S):(E,S):(F,S):[]
CLOSED (S,null):[]

2.
NODE A
close (A,S)
moveGen B:F:H:S:[]
newNodes H:[]
newPairs (H,A):[]

OPEN (H,A):(B,S):(C,S):(D,S):(E,S):(F,S):[]
CLOSED (A,S):(S,null):[]

3.
NODE H
close (H,A)
moveGen A:I:M:N:[]
newNodes I:M:N:[]
newPairs (I,H):(M,H):(N,H):[]

OPEN (I,H):(M,H):(N,H):(B,S):(C,S):(D,S):(E,S):(F,S):[]
CLOSED (H,A):(A,S):(S,null):[]

4.
NODE I
close (I,H)
moveGen B:H:J:O:[]
newNodes J:O:[]
newPairs (J,I):(O,I):[]

OPEN (J,I):(O,I):(M,H):(N,H):(B,S):(C,S):(D,S):(E,S):(F,S):[]
CLOSED (I,H):(H,A):(A,S):(S,null):[]

5.
NODE J
close (J,I)
moveGen C:I:K:P:[]
newNodes K:P:[]
newPairs (K,J):(P,J):[]

OPEN (K,J):(P,J):(O,I):(M,H):(N,H):(B,S):(C,S):(D,S):(E,S):(F,S):[]
CLOSED (J,I):(I,H):(H,A):(A,S):(S,null):[]

6.
NODE K
close (K,J)
moveGen D:J:L:Q:[]
newNodes L:Q:[]
newPairs (L,K):(Q,K):[]

OPEN (L,K):(Q,K):(P,J):(O,I):(M,H):(N,H):(B,S):(C,S):(D,S):(E,S):(F,S):[]
CLOSED (K,J):(J,I):(I,H):(H,A):(A,S):(S,null):[]

7.
NODE L
close (L,K)
moveGen E:K:M:R:[]
newNodes R:[]
newPairs (R,L):[]

OPEN (R,L):(Q,K):(P,J):(O,I):(M,H):(N,H):(B,S):(C,S):(D,S):(E,S):(F,S):[]
CLOSED (L,K):(K,J):(J,I):(I,H):(H,A):(A,S):(S,null):[]

8.
NODE R
close (R,L)
moveGen G:L:Q:[]
newNodes G:[]
newPairs (G,R):[]

OPEN (G,R):(Q,K):(P,J):(O,I):(M,H):(N,H):(B,S):(C,S):(D,S):(E,S):(F,S):[]
CLOSED (R,L):(L,K):(K,J):(J,I):(I,H):(H,A):(A,S):(S,null):[]

9.
NODE G
GOAL G

OPEN (G,R):(Q,K):(P,J):(O,I):(M,H):(N,H):(B,S):(C,S):(D,S):(E,S):(F,S):[]
CLOSED (R,L):(L,K):(K,J):(J,I):(I,H):(H,A):(A,S):(S,null):[]

PATH S:A:H:I:J:K:L:R:G:[]