

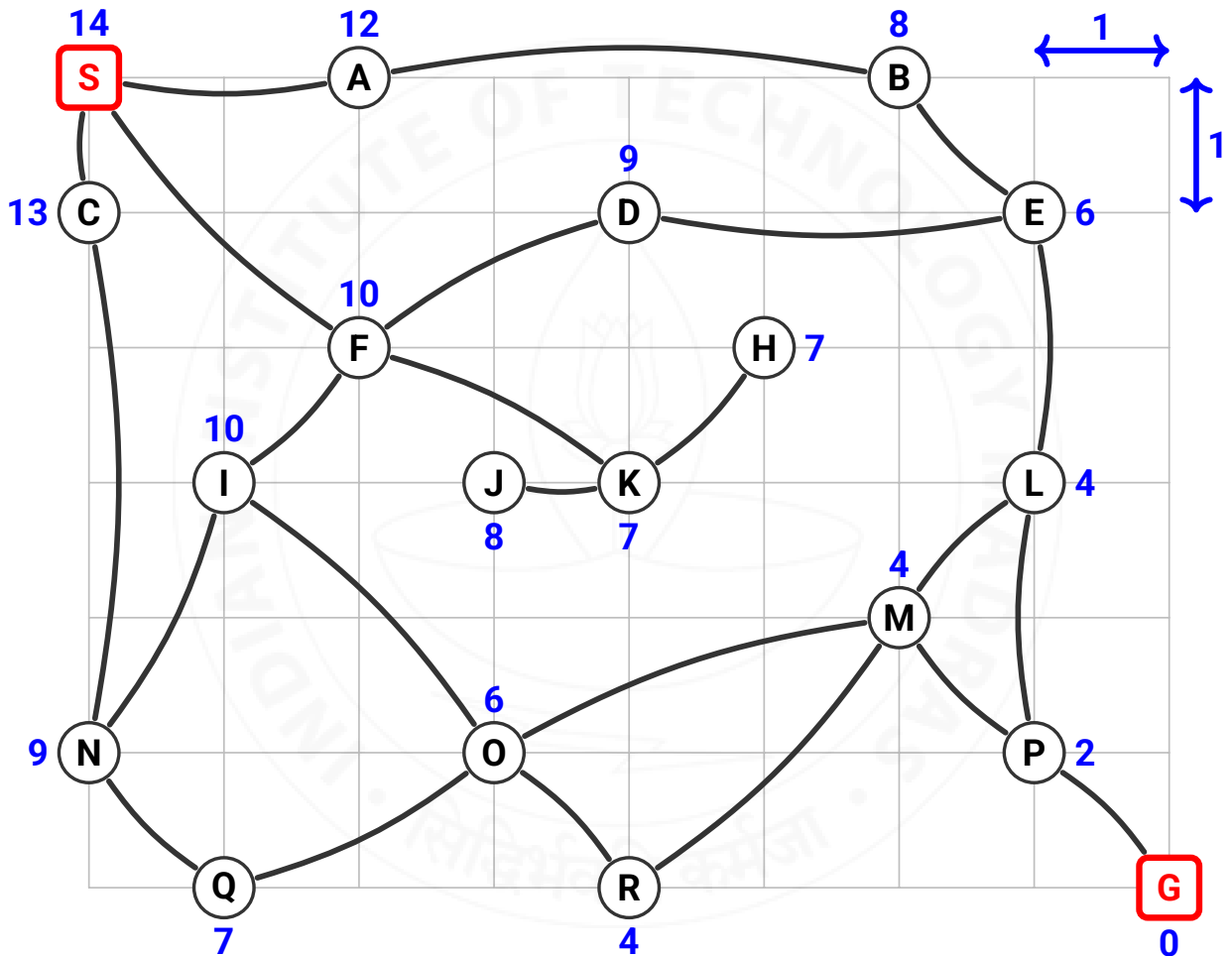
# Lecture Example: City 1

## Best First Search

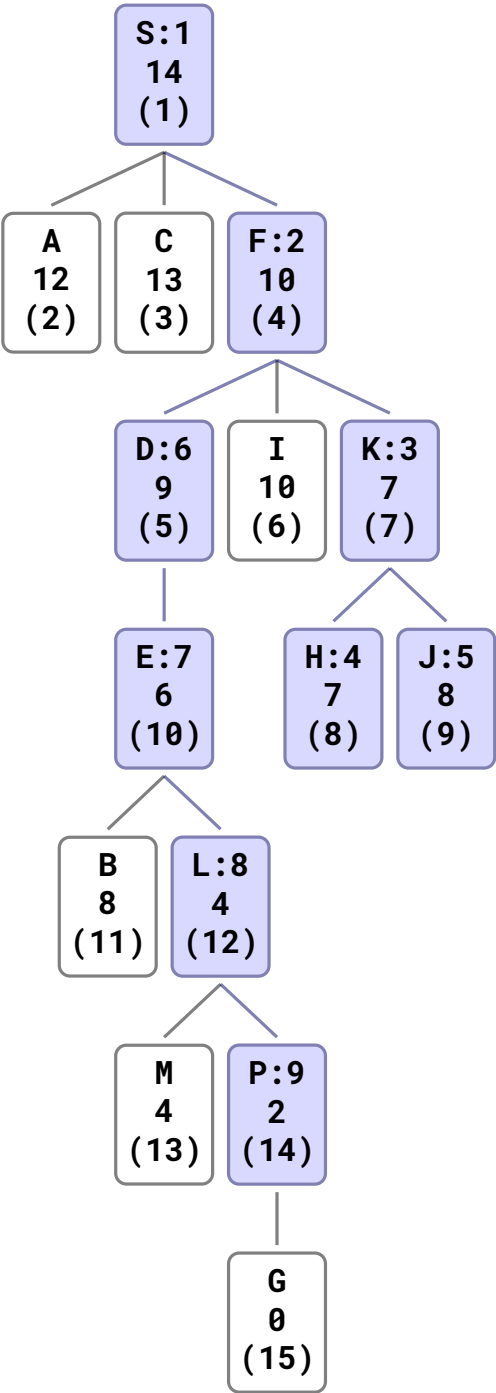
Prepared by S. Baskaran

### State Space

MoveGen returns nodes in ALPHABETICAL ORDER.



# Search Tree



# Solution

OPEN and CLOSED carry tuples: (NODE,PARENT,H-VALUE)

OPEN (S,null,14):[]  
CLOSED []

1.  
NODE S  
close (S,null,14)  
moveGen A:C:F:[]  
newNodes A:C:F:[]  
newPairs (A,S,12):(C,S,13):(F,S,10):[]

OPEN (F,S,10):(A,S,12):(C,S,13):[]  
CLOSED (S,null,14):[]

2.  
NODE F  
close (F,S,10)  
moveGen D:I:K:S:[]  
newNodes D:I:K:[]  
newPairs (D,F,9):(I,F,10):(K,F,7):[]

OPEN (K,F,7):(D,F,9):(I,F,10):(A,S,12):  
(C,S,13):[]

CLOSED (F,S,10):(S,null,14):[]

3.  
NODE K  
close (K,F,7)  
moveGen F:H:J:[]  
newNodes H:J:[]  
newPairs (H,K,7):(J,K,8):[]

OPEN (H,K,7):(J,K,8):(D,F,9):(I,F,10):  
(A,S,12):(C,S,13):[]

CLOSED (K,F,7):(F,S,10):(S,null,14):[]

4.  
NODE H  
close (H,K,7)  
moveGen K:[]  
newNodes []  
newPairs []

OPEN (J,K,8):(D,F,9):(I,F,10):(A,S,12):  
(C,S,13):[]

CLOSED (H,K,7):(K,F,7):(F,S,10):(S,null,14):[]

5.  
NODE J  
close (J,K,8)  
moveGen K:[]  
newNodes []  
newPairs []

OPEN (D,F,9):(I,F,10):(A,S,12):(C,S,13):[]  
CLOSED (J,K,8):(H,K,7):(K,F,7):(F,S,10):  
(S,null,14):[]

6.  
NODE D  
close (D,F,9)  
moveGen E:F:[]  
newNodes E:[]  
newPairs (E,D,6):[]

OPEN (E,D,6):(I,F,10):(A,S,12):(C,S,13):[]  
CLOSED (D,F,9):(J,K,8):(H,K,7):(K,F,7):  
(F,S,10):(S,null,14):[]

7.  
NODE E  
close (E,D,6)  
moveGen B:D:L:[]  
newNodes B:L:[]  
newPairs (B,E,8):(L,E,4):[]

OPEN (L,E,4):(B,E,8):(I,F,10):(A,S,12):  
(C,S,13):[]

CLOSED (E,D,6):(D,F,9):(J,K,8):(H,K,7):  
(K,F,7):(F,S,10):(S,null,14):[]

8.  
NODE L  
close (L,E,4)  
moveGen E:M:P:[]  
newNodes M:P:[]  
newPairs (M,L,4):(P,L,2):[]

OPEN (P,L,2):(M,L,4):(B,E,8):(I,F,10):  
(A,S,12):(C,S,13):[]

CLOSED (L,E,4):(E,D,6):(D,F,9):(J,K,8):  
(H,K,7):(K,F,7):(F,S,10):(S,null,14):[]

9.  
NODE P  
close (P,L,2)  
moveGen G:L:M:[]  
newNodes G:[]  
newPairs (G,P,0):[]

OPEN (G,P,0):(M,L,4):(B,E,8):(I,F,10):  
(A,S,12):(C,S,13):[]

CLOSED (P,L,2):(L,E,4):(E,D,6):(D,F,9):  
(J,K,8):(H,K,7):(K,F,7):(F,S,10):  
(S,null,14):[]

10.  
NODE G  
GOAL G

OPEN (G,P,0):(M,L,4):(B,E,8):(I,F,10):  
(A,S,12):(C,S,13):[]

CLOSED (P,L,2):(L,E,4):(E,D,6):(D,F,9):  
(J,K,8):(H,K,7):(K,F,7):(F,S,10):  
(S,null,14):[]

PATH S:F:D:E:L:P:G:[]