

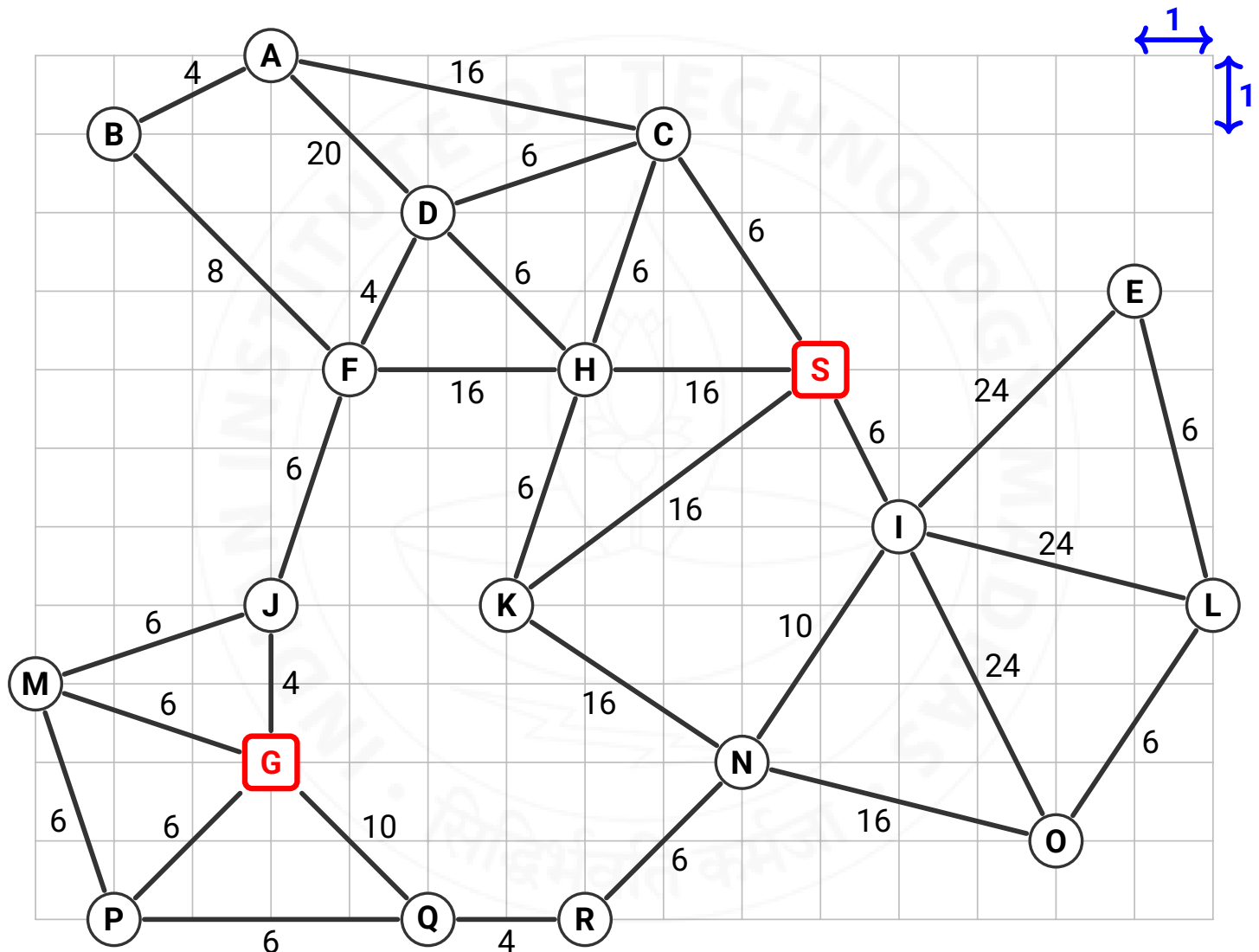
# Practice Assignment: City Map Example

## A\* Search

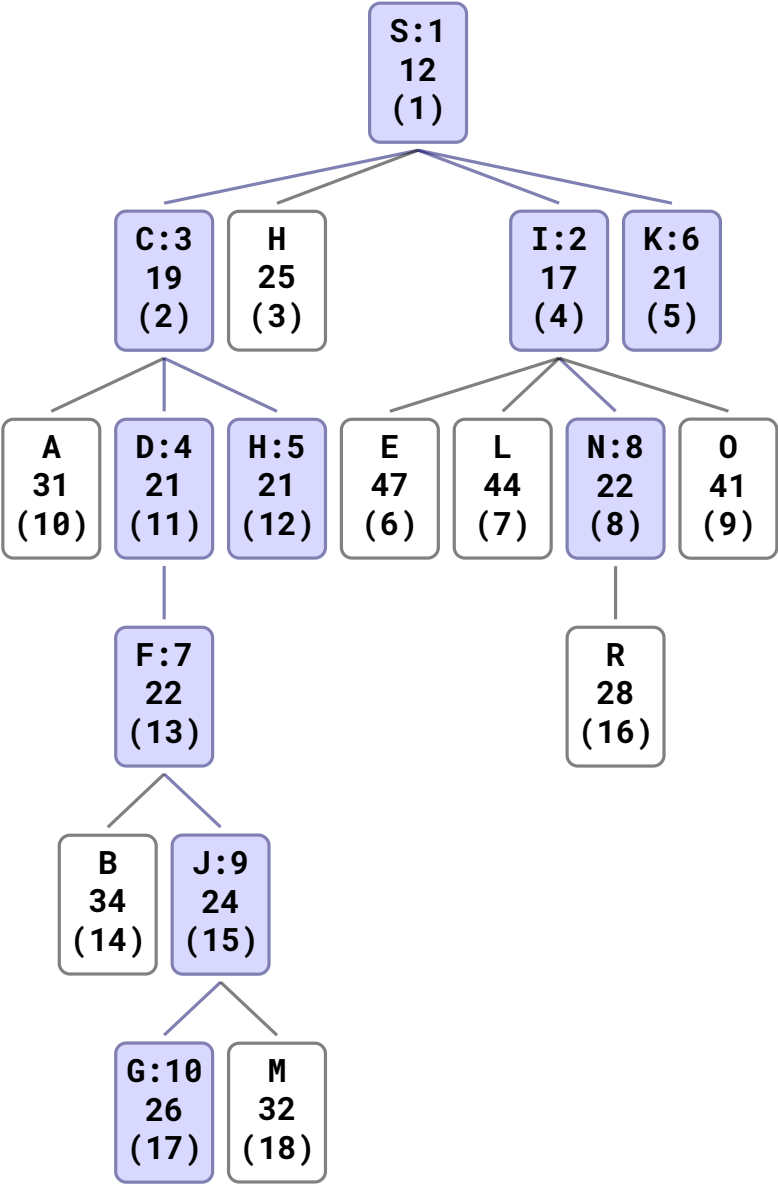
Prepared by S. Baskaran

### State Space

MoveGen returns nodes in ALPHABETICAL ORDER.



# Search Tree



Solution

OPEN and CLOSED carry tuples: (NODE,PARENT,f,g,h)

OPEN	(S,null,12,0,12):[]
CLOSED	[]
1.	
NODE	S
close	(S,null,12,0,12)
moveGen	C:H:I:K:[]
new-open	(C,S,19,6,13)
new-open	(H,S,25,16,9)
new-open	(I,S,17,6,11)
new-open	(K,S,21,16,5)
OPEN	(I,S,17,6,11):(C,S,19,6,13):(K,S,21,16,5):(H,S,25,16,9):[]
CLOSED	(S,null,12,0,12):[]
2.	
NODE	I
close	(I,S,17,6,11)
moveGen	E:L:N:O:S:[]
new-open	(E,I,47,30,17)
new-open	(L,I,44,30,14)
new-open	(N,I,22,16,6)
new-open	(O,I,41,30,11)
OPEN	(C,S,19,6,13):(K,S,21,16,5):(N,I,22,16,6):(H,S,25,16,9):(O,I,41,30,11):(L,I,44,30,14):(E,I,47,30,17):[]
CLOSED	(I,S,17,6,11):(S,null,12,0,12):[]
3.	
NODE	C
close	(C,S,19,6,13)
moveGen	A:D:H:S:[]
new-open	(A,C,31,22,9)
new-open	(D,C,21,12,9)
pi-open	(H,C,21,12,9)
OPEN	(D,C,21,12,9):(H,C,21,12,9):(K,S,21,16,5):(N,I,22,16,6):(A,C,31,22,9):(O,I,41,30,11):(L,I,44,30,14):(E,I,47,30,17):[]
CLOSED	(C,S,19,6,13):(I,S,17,6,11):(S,null,12,0,12):[]
4.	
NODE	D
close	(D,C,21,12,9)
moveGen	A:C:F:H:[]
new-open	(F,D,22,16,6)
OPEN	(H,C,21,12,9):(K,S,21,16,5):(F,D,22,16,6):(N,I,22,16,6):(A,C,31,22,9):(O,I,41,30,11):(L,I,44,30,14):(E,I,47,30,17):[]
CLOSED	(D,C,21,12,9):(C,S,19,6,13):(I,S,17,6,11):(S,null,12,0,12):[]
5.	
NODE	H
close	(H,C,21,12,9)
moveGen	C:D:F:K:S:[]
OPEN	(K,S,21,16,5):(F,D,22,16,6):(N,I,22,16,6):(A,C,31,22,9):(O,I,41,30,11):(L,I,44,30,14):(E,I,47,30,17):[]
CLOSED	(H,C,21,12,9):(D,C,21,12,9):(C,S,19,6,13):(I,S,17,6,11):(S,null,12,0,12):[]
6.	
NODE	K
close	(K,S,21,16,5)
moveGen	H:N:S:[]
OPEN	(F,D,22,16,6):(N,I,22,16,6):(A,C,31,22,9):(O,I,41,30,11):(L,I,44,30,14):(E,I,47,30,17):[]
CLOSED	(K,S,21,16,5):(H,C,21,12,9):(D,C,21,12,9):(C,S,19,6,13):(I,S,17,6,11):(S,null,12,0,12):[]
7.	
NODE	F
close	(F,D,22,16,6)
moveGen	B:D:H:J:[]
new-open	(B,F,34,24,10)
new-open	(J,F,24,22,2)
OPEN	(N,I,22,16,6):(J,F,24,22,2):(A,C,31,22,9):(B,F,34,24,10):(O,I,41,30,11):(L,I,44,30,14):(E,I,47,30,17):[]
CLOSED	(F,D,22,16,6):(K,S,21,16,5):(H,C,21,12,9):(D,C,21,12,9):(C,S,19,6,13):(I,S,17,6,11):(S,null,12,0,12):[]
8.	
NODE	N
close	(N,I,22,16,6)
moveGen	I:K:O:R:[]
new-open	(R,N,28,22,6)
OPEN	(J,F,24,22,2):(R,N,28,22,6):(A,C,31,22,9):(B,F,34,24,10):(O,I,41,30,11):(L,I,44,30,14):(E,I,47,30,17):[]
CLOSED	(N,I,22,16,6):(F,D,22,16,6):(K,S,21,16,5):(H,C,21,12,9):(D,C,21,12,9):(C,S,19,6,13):(I,S,17,6,11):(S,null,12,0,12):[]
9.	
NODE	J
close	(J,F,24,22,2)
moveGen	F:G:M:[]
new-open	(G,J,26,26,0)
new-open	(M,J,32,28,4)
OPEN	(G,J,26,26,0):(R,N,28,22,6):(A,C,31,22,9):(M,J,32,28,4):(B,F,34,24,10):(O,I,41,30,11):(L,I,44,30,14):(E,I,47,30,17):[]
CLOSED	(J,F,24,22,2):(N,I,22,16,6):(F,D,22,16,6):(K,S,21,16,5):(H,C,21,12,9):(D,C,21,12,9):(C,S,19,6,13):(I,S,17,6,11):(S,null,12,0,12):[]
10.	
NODE	G
close	(G,J,26,26,0)
GOAL	G
OPEN	(R,N,28,22,6):(A,C,31,22,9):(M,J,32,28,4):(B,F,34,24,10):(O,I,41,30,11):(L,I,44,30,14):(E,I,47,30,17):[]
CLOSED	(G,J,26,26,0):(J,F,24,22,2):(N,I,22,16,6):(F,D,22,16,6):(K,S,21,16,5):(H,C,21,12,9):(D,C,21,12,9):(C,S,19,6,13):(I,S,17,6,11):(S,null,12,0,12):[]
PATH	S:C:D:F:J:G:[]
PATH COST	26