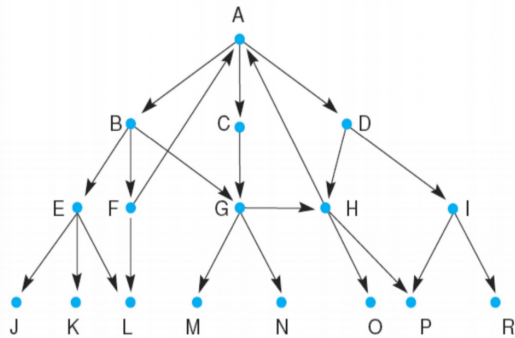


# Exercise 3: Backtracking on Graph

## Exercise 3 : Backtracking on Graph



Check CS = Goal?

Check if CS has children ? Exclude existing ones

**Yes:** growing NSL (add to left)

reset CS

add CS to SL

**NO:** remove current CS =>DE

remove CS from SL & NSL

CS reset by 1<sup>st</sup> from NSL

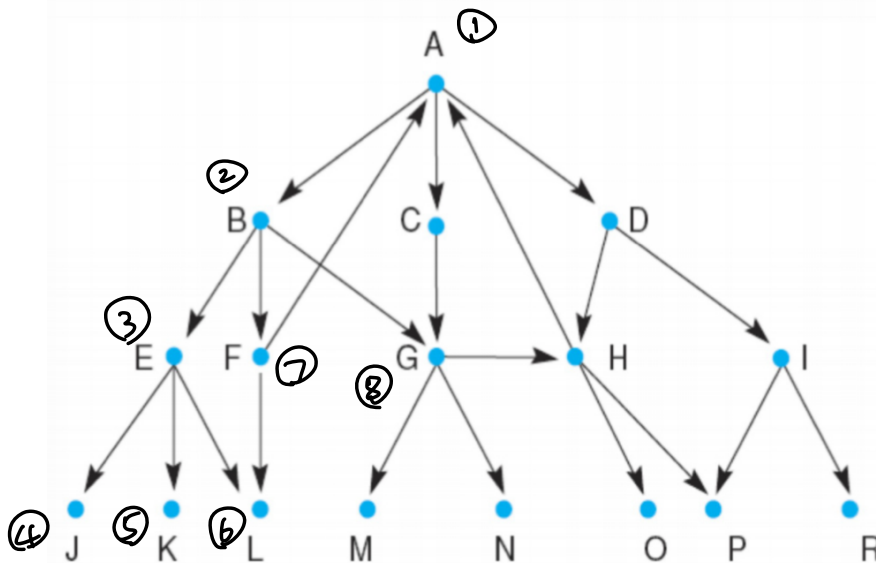
if CS=1<sup>st</sup> SL, loop back to NO.

add CS to SL

Assume: there is no goal state in the search space.

Initialize: SL=[A];NSL=[A]; DE=[ ]; CS=A;

Solution



Iteration	CS	SL	NSL	DE
0	A	A	A	C]
1	<u>②</u> B	<u>③</u> BA	<u>④</u> BCDA	
2	E	EBA	EFG BCDA	
3	J	<del>J</del> EBA	<del>J</del> KL EFG BCDA	
4	<u>④</u> K →	<u>⑤</u> KEBA	<u>②</u> KL EFG BCDA	<u>①</u> J
5	L	<del>L</del> EBA	<del>L</del> EFG BCDA	KJ
	<u>④</u> E	<u>⑤</u> EBA	<u>③</u> EFG BCDA	<u>①</u> LKJ
6	F	FBA	F GBCDA	ELKJ
7	G	GBA	GBCDA	FELKJ

# LIFO&FILO

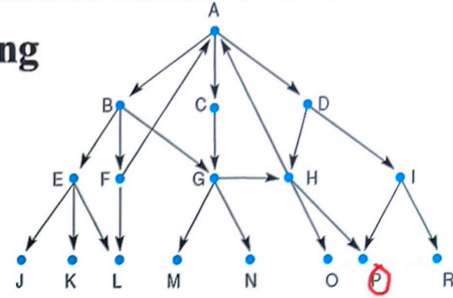
## Exercise 3: The BackTracking

“Hand run” the backtracking algorithm on the right graph

Keep track of the successive values of NSL, SL, CS, DE.

We assume there is no goal state in the search space.

Initialize: SL=[A];NSL=[A]; DE=[]; CS=A;



Loop	CS	SL	NSL	DE
0	A	[A]	[A]	//check CS =goal? Has new children ?
1	B	[B,A]	[B,C,D,A]	//add children to NSL - 'stack'; reset CS; update SL
2	E	[E,B,A]	[E,F,G, B,C,D,A]	//add children to NSL - 'stack'; reset CS; update SL
3	J	[J, E,B,A]	[J,K,L, E,F,G, B,C,D,A]	//J no children: CS=>DE; update SL, NSL; reset CS; update SL
4	K	[K,E,B,A]	[K,L,E,F,G, B,C,D,A]	[J]
5	L	[L,E,B,A]	[L,E,F,G, B,C,D,A]	[K, J] // remove L, E
6	F	[F, B,A]	[F,G,B,C,D,A]	[E, L, K, J]
7	G	[G,B,A]	[G,B,C,D,A]	[F, E, L, K, J]
8	M	[M,G,B,A]	[M,N,H, G, B,C,D,A]	[F, E, L, K, J]
9	N	[N,G,B,A]	[N,H,G,B,C,D,A]	[M, F, E, L, K, J]
10	H	[H,G,B,A]	[H,G,B,C,D,A]	[N, M, F, E, L, K, J]
11	O	[O,H,G,B,A]	[O,P,H,G,B,C,D,A]	[N, M, F, E, L, K, J]
12	P	[P,H,G,B,A]	[P,H,G,B,C,D,A]	[O, N, M, F, E, L, K, J] // remove P,H,G,B
13	C	[C,A]	[C,D,A]	[B,G,H,P, O, N, M, F, E, L, K, J]
14	D	[D,A]	[D,A]	[C,B,G,H,P, O, N, M, F, E, L, K, J]
15	I	[I,D,A]	[I,D,A]	[C,B,G,H,P, O, N, M, F, E, L, K, J]
16	R	[R,I,D,A]	[R,I,D,A]	[C,B,G,H,P, O, N, M, F, E, L, K, J]
17	-	[]	[]	[A,D,I,R, C,B,G,H,P, O, N, M, F, E, L, K, J]