

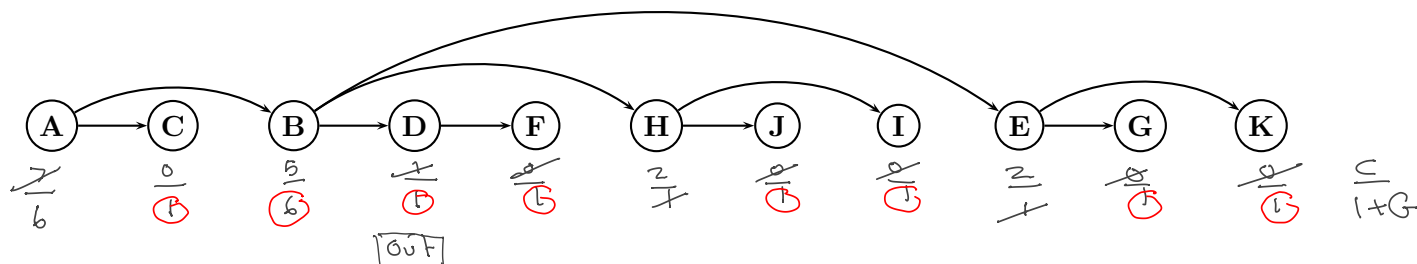
CIS 3223 TMQ 8

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Name: Solutions

Temple ID (last 4 digits):

1 Topological sort of the tree $T = (V, E)$:



For each vertex, let

$T(u)$ denote the subtree of T with root u ,

$L(u)$ = size of the maximal independent set contained in $T(u)$,

$S(u)$ = true if u is counted in $L(u)$ and false otherwise.

$C(u) = \sum_{\text{children } w \text{ of } u} L(w)$

$G(u) = \sum_{\text{grandchildren } w \text{ of } u} L(w)$

Traverse through the topological sort in reverse order (right to left) and complete the table.

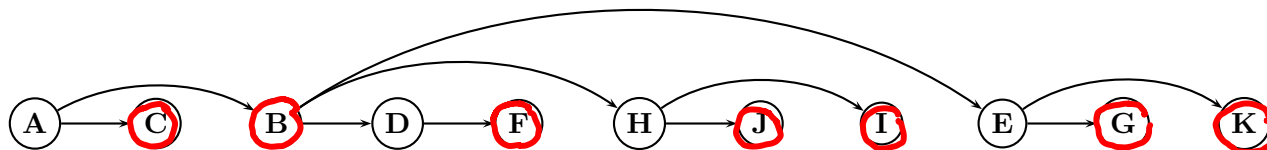
In a tie, include the node in S .

L	7	6	1	1	2	1	1	2	1	1	1
S	0	1	1	1	0	1	1	0	1	1	1
C	7	5	0	1	2	0	0	2	0	0	0
1+G	6	6	1	1	1	1	1	1	1	1	1
V	A	B	C	D	E	F	G	H	I	J	K

If $|S| > L(A)$, traverse the sort from left to right checking children.

S	0	1	1	0	0	1	1	0	1	1	1
V	A	B	C	D	E	F	G	H	I	J	K

List the maximal independent set found (and shade nodes) _____



Can there be more than one maximal independent set (circle)? yes no

If $|V| = n$, what is the runtime for the algorithm? $\Theta(\quad)$