DIMACS

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NEW YORK CITY COLLEGE OF TECHNOLOGY CUNY

Graph Rubbling

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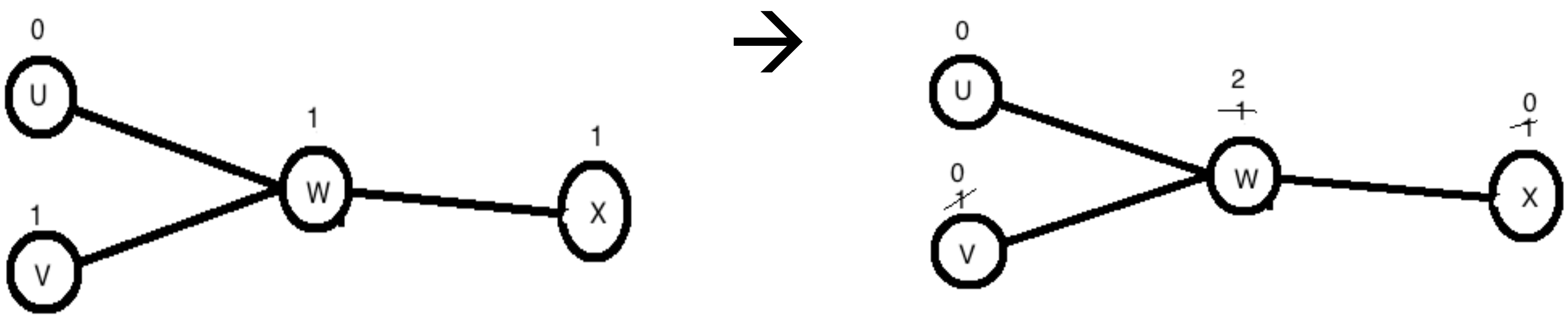
Rubbling Move

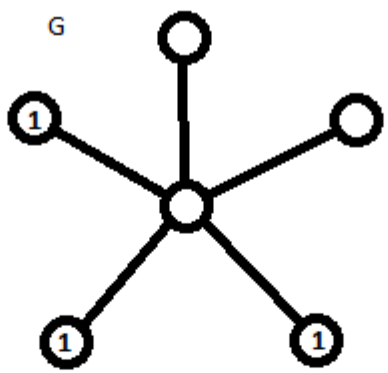
Remove two pebbles from neighbors of w and add one pebble on w.

For example :

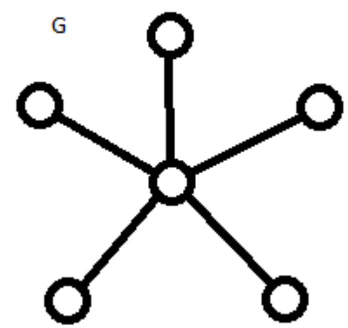


Rubbling Number, ρ(G)

- The minimum number *m* that every vertices of *G* are reachable from any pebble distribution of size *m*.
- For example:



$\rho(G)>3$



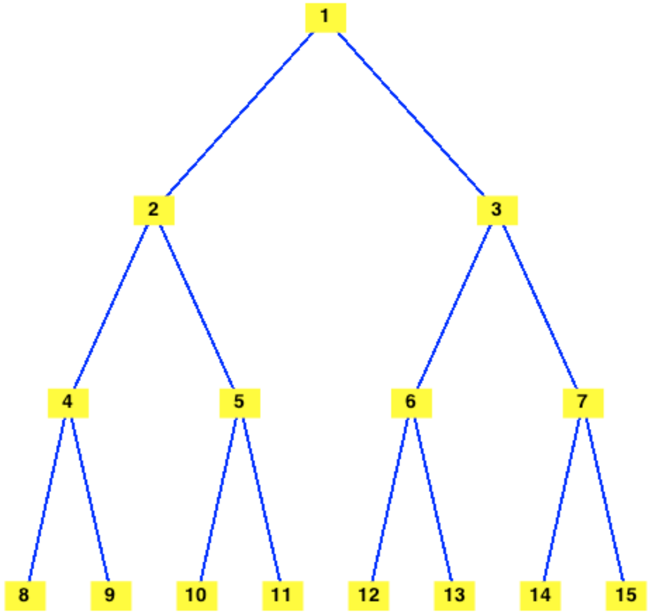
$\rho(G)=?$

Few Facts about Rubbling

- $\rho(K_n)=2$,where K_n is the complete graph($n\geq 2$)
- $\rho(W_n)=4$ where W_n is the wheel graph($n\geq 5$)
- $\rho(C_{2k})=2^K$, where C_{2k} is an even cycle.
- $\rho(T_k)=?$

Tree

- A tree is a connected undirected graph with no circle.
- T_k: a complete binary tree of height k
- Example of T_3



Rubbling Number of a Rooted Complete Binary Tree

- $\rho\ (T_{k,} r)$: The minimum number of pebbles needed so that the root is reachable for any distribution.
- $\rho\ (T_{1,} r)=2$
- $\rho\ (T_{2,} r)=5$
- $\rho\ (T_{k,} r)=k*2^{k-1}+1$

Conjecture for Complete Binary Tree

- $\rho(T_3)=66$
- $\rho(T_k)=2^{2k}+2+(k-3)*^{2k-1}(k\geq3)$.

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Thanks Alma


Thanks!