

Earliest End Time

Intuition: If u has the earliest end time, and u overlaps with v and w then v and w also overlap.

Why?

Approximation Ratio

For a minimization problem (find the shortest/smallest/least/etc.)

If $OPT(I)$ is the value of the best solution for input I , and $ALG(I)$ is the value that your algorithm finds, then ALG is an α approximation algorithm if for every I ,

$$\alpha \cdot OPT(I) \geq ALG(I)$$

i.e. you're always within an α factor of the real best.

Sometimes use big- \mathcal{O} notation on the ratio.

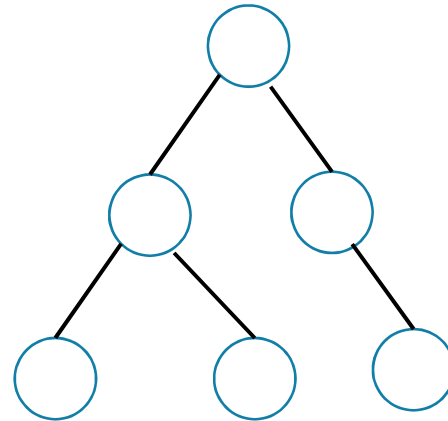
Vertex Cover

Vertex Cover

A set S of vertices is a vertex cover if for every edge (u, v) : u is in S , or v is in S , (or both)

Find the minimum vertex cover in a graph.

We're picking a set of *vertices* so that the *vertices* cover every edge.



Non-optimal

Showing idea 1 doesn't work is a good exercise!

Focus on idea 2, come up with a graph where it could give you the optimal VC, and another where it doesn't.

Idea 2: At least one good one

Choose an (arbitrary) edge (u, v) . At least one of u, v is in the minimum VC. But both in your VC. Delete all incident edges.