

Tutorial 3 Summary

Technique: ordering vertices.

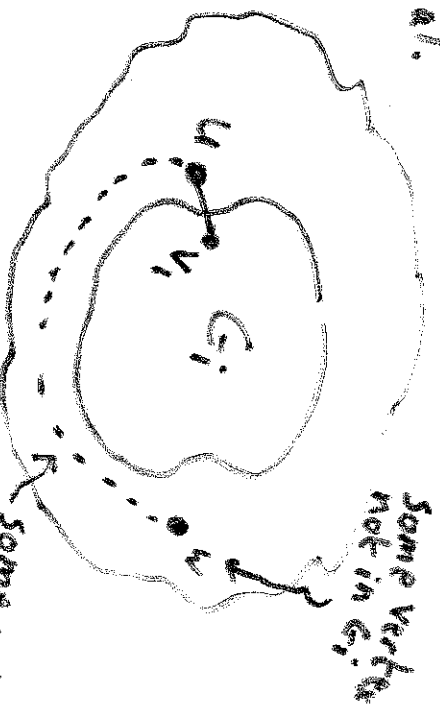
Problem: Let G be a connected graph on n -vertices. Then the vertices can always be enumerated so that $G_i := G[V_1, \dots, V_i]$ is connected for all $1 \leq i \leq n$.

Proof: Induction.

Base case: $n=1$ trivial.

Induction step:

set $V_{i+1} := u$



Corollary: Vertices of a tree can be ordered v_1, v_2, \dots, v_n so that each $v_i, i \geq 2$, has a unique neighbour in $\{v_1, v_2, \dots, v_{i-1}\}$

\Rightarrow a tree has $n-1$ edges.

Corollary: If T is a tree and G is a graph with $\min\{\deg(v) | v \in V(G)\} \geq |T|-1$ then G has a subgraph isomorphic to T .

Proof: Build it inductively as in the previous problems.