THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

CS 2312: Lab 09

GW SCHOOL OF ENGINEERING & APPLIED SCIENCE

Shared Degree

Given a graph with $n \geq 2$ vertices, prove that there are at least two vertices with the same degree.

Two Terminals

Prove that if *G* is a DAG (has zero cycles) with at least two distinct sinks such that there is a path from every source to every sink, then *G* must have at least one node of outdegree ≥ 2.

1-3 Trees

We say that a tree, *T* is a 1-3 tree if each of the vertices in the tree have either a degree of 3 or a degree of 1.

- Prove that if a 1-3 tree has *l* leaves, then it has *l* - 2 vertices of degree 3.
- Let *T* be a 1-3 tree with at least 4 leaves. Prove that in *T* there exists an internal vertex that is adjacent to exactly two leaves.