CS 230 : Discrete Computational Structures
Spring Semester, 2021
ASSIGNMENT #11 [**Extra Credit**]
Due Date: Friday, April 30

For the problems below, explain your answers and show your reasoning.

1. [**10 Pts**] If G is a simple graph with n vertices and n edges, is G connected? If *yes*, give a short justification. If *no*, give a counterexample.

2. [**8 Pts**] Consider a graph G that has 7 vertices with degrees of 5, 4, 3, 3, 2, 2, 1. How many edges does G have? Explain.

3. [**12 Pts**] Prove by induction that a complete binary tree of height h has 2^h leaves. Use the inductive definition of complete binary trees.

4. [**20 Pts**] Prove that a graph is a tree if and only if it is acyclic but adding any edge will create a cycle.