Assignment 2

COMP 4500 Due: February 2, 2024 by 11:59 p.m. Upload your Word, PDF, or LaTeX file(s) to Blackboard

Exercises from the Textbook (40 points):

Page 107: 1, 3, 4, 5

Additional Exercises (60 points):

1. Prove the following claim by induction:

$$\sum_{i=1}^{n+1} i \cdot 2^{i} = n \cdot 2^{n+2} + 2, n \in \mathbb{Z}, n \ge 0$$

- 2. Draw an undirected graph with four vertices of degrees 1, 2, 3, and 4, respectively, or explain why one does not exist. Note that the graph does not need to be a simple graph.
- 3. In a group of 25 people, is it possible for each to shake hands with exactly 3 other people? Explain.
- 4. Draw all non-isomorphic simple graphs with four vertices.
- 5. Draw a tree with twelve vertices and fourteen edges or explain why one does not exist.
- 6. Prove that every tree with two or more vertices has at least two vertices with degree 1.

Extra Credit (10 points):

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