Degree sequences

- Read 2.3, pages 43-47
  - What do we refer to as **degree sequence** of a graph?
  - Write down all possible degree sequences for all graphs of order 2, 3 and 4.
  - True or False: all sequences of non-negative numbers are **graphical**
  - Theorem 2.10 describes a process of testing if a non-increasing sequence is graphical.
    * Carry out that process to determine if the sequence $3, 3, 2, 1, 1$ is graphical. If it is, construct a graph with that sequence.
    * Prove the backward direction of the theorem: If the constructed sequence s_1 is graphical, then we can explicitly construct a graph for the original sequence s by extending the graph for s_1.
    * Prove the forward direction of the theorem: If s is graphical, show that s_1 is also graphical by suitable manipulation of the graph corresponding to s. There are two cases to distinguish: If there is a graph with degree sequence s where a vertex of degree d_1 is connected to the vertices with the next d_1 degrees, i.e. $d_2, d_3, \cdots, d_{d_1+1}$, and if there is no such graph. In particular, make sure you understand the meaning of the diamond graphs in Figure 2.15.
  - Study example 2.11 on page 46.
  - Problems to work on: 2.31, 2.32