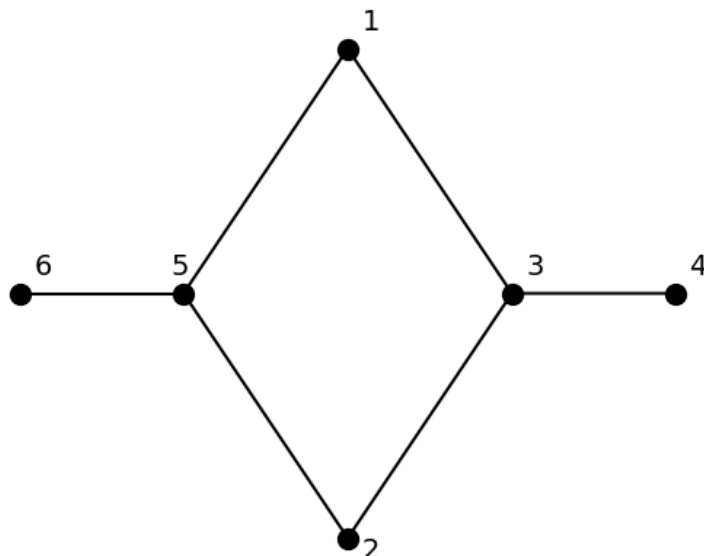# Linear Data Chapter 2

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1. (a) What is numeration?

   (b) Give an example of coding in the context of numeration.

2. Suppose we wanted to understand on what type of device students watched lecture videos: phone, tablet, laptop, desktop. Devise a one-hot encoding scheme for this classification.

3. Consider the graph/network plotted below.

   Explicitly give (i.e., write down all of the entries) the adjacency matrix $\mathbf{A}$ of the graph.

4. Using Python/Jupyter or Matlab/Matlab Live Script, perform the following:

   - Generate three different random row vectors with 4 entries, $\vec{a}$, $\vec{b}$, and $\vec{c}$.
   - Set $\vec{d} = \vec{a} + \vec{b} + \vec{c}$.
   - Set $\vec{e} = \vec{b} + \vec{c} + \vec{a}$.
   - Test if $\vec{d}$ and $\vec{e}$ are the same up to uncertainty in floating point arithmetic. (Sometimes, but not always, they will be exactly the same, but you cannot count on that.)