**Problem 4-1.** You are layout editor for Town & Style Magazine, a “luxury lifestyle magazine serving the St. Louis metropolitan area.” You are given a collection of \( n \) news articles \( a_1 \ldots a_n \), such that article \( a_i \) occupies \( \ell_i \) column inches. After laying out all the ads for the paper, you are left with \( n \) slots \( s_1 \ldots s_n \), such that \( s_j \) can hold a news article of up to \( m_j \) column inches.

Any article can be run in any slot. However, if an article is too long for its slot, some text must be cut to make it fit; if the article is too short, you must paste in some random content from Wikipedia to make it long enough to fill the whole slot. Neither change is desirable; it is best to run an article in a slot that is the right size for it.

Give an \( O(n \log n) \)-time algorithm to assign articles to slots so as to minimize the total change required for all articles. If \( a_i \) is assigned to \( s_j \), the change required for \( a_i \) is \( |\ell_i - m_j| \).

**Problem 4-2.** Kleinberg & Tardos Chapter 6, question 24.

*Hint:* Ask yourself: How can we gerrymander precincts 1 to \( j \) for each \( j \) — in particular, you want to see if there is a way to assign precincts out of the first \( j \) to districts to get a particular number of votes in each district. The DP table you will construct is larger than we have seen so far in class and requires a reasonable amount of thought.