About final

- About 8–10 problems.
- Covers everything.
  - Basic counting (Before Midterm 1): About 35%;
  - Advanced counting (Between midterms): About 40%;
  - Graph theory and design theory: About 25%.

To review

> **Please review lecture notes/homeworks/midterms, and let me know any topics/problems that you want me to cover in the two lectures next week.**

- For material before Midterm 1, please see review lectures on Jan. 30 and Feb. 1;
- For material before Midterm 2, please see review lectures on Mar. 13 and Mar. 15;
- For graph theory, please see Mar. 31 lecture.
- For design theory:
  - Definition of (v, b, r, k)-design and (v, b, r, k, λ)-design.
    - v: Number of symbols;
    - b: Number of blocks;
    - r: How many times each symbol appears in the array;
    - k: How many symbols in each block;
    - λ: How many times each pair of symbols appear, that is the number of blocks each pair of symbols are in.
  - Necessary conditions:
    - For (v, b, r, k)-designs: Two ways of counting symbols must give the same answer.

$$v\, r = b\, k. \tag{1}$$

    - For (v, b, r, k, λ)-designs: Two ways of counting pairs of symbols must give the same answer.

$$\lambda\, (v - 1) = r\, (k - 1). \tag{2}$$

  - For Latin squares:
    - Definition of $n \times n$ Latin squares.
    - Simple ways to construct Latin squares.
    - Definition of orthogonal Latin squares.