Review for Test 1
October, 17

1. Basics of Counting
   - Counting strings. For example string over alphabet A, C, G, T of length 40 with (1) exactly 20 a's, (2) at most 2 a's, (3) at most 98 a's, (4) two consecutive a's.
   - Basic recurrence relations.
2. Graph Theory
   - Definition of a graph. Finding the number of edges of a graph.
   - Euler paths and tours.
3. Algorithms
   - "Big Oh" notation.
   - Basic algorithms: finding maximum, substrings, counting characters.
4. Probability Theory
   - Basic probability using counting.
   - The random string model.
   - Conditional probability, independent events.
   - The posterior probability and Bayes' formula.
5. Alignment
   - The dynamic algorithm for finding an optimal global alignment of two strings (with linear gap penalty).
   - Local alignment problem.
   - The dynamic algorithm for finding an optimal local alignment of two strings (with linear gap penalty).

- Semi-global alignment.
- The affine gap penalty model and the dynamic programming algorithm for the global alignment in this model.
- Time complexity of the above algorithms.