1 Sequence Alignment Algorithms

- Edit Graphs
- Global Alignment: the Needleman-Wunsch Algorithm
- Scoring Function
- Local Alignment: the Smith-Waterman Algorithm
- Gapped Alignment
- Shortest Path in a Graph: Dijkstra’s Algorithm

2 Combinatorial Pattern Matching

- Deterministic Finite Automata and Regular Expressions
- Finding a Pattern in a Text: the Knuth-Morris-Pratt Algorithm
- Failure Function
- Suffix Trees

3 Phylogenetic Trees

- Clustering Methods: the UPGMA Algorithm and the Neighbor-Joining Algorithm
- Find a Tree with the Fewest Mutations: the Parsimony Algorithm

4 Hidden Markov Models

- Markov Chains
- Hidden Markov Models
- The Evaluation Problem: the Forward Algorithm
- The Decoding Problem: the Viterbi Algorithm

5 Genome Assembly

- Representing Overlaps Between Sequences: the De Bruijn Assembly Algorithm