BMI/CS 576 – Day 8

- Today
  - Dynamic programming!
- Next week
  - Variants of the pairwise alignment task
    - local alignment, affine gap alignment
  - Dynamic programming algorithms to solve the variants
  - Intro/review of probability
    - random variables, independence, distributions

HW1

- Reminder: Due Monday
- If you turn it in after Monday, consider using some of your free “slip” days
- HW2 will be assigned next week

Muddiest points

- How are log-odds ratios connected to alignment scores?
  - We will get to this in 1.5 weeks when we discuss substitution matrices and their probabilistic derivations
- For global alignment, why is the matrix (m+1) x (n +1) instead of (m) x (n)?
  - Each entry of the matrix corresponds to a subproblem
  - Entry (m, n) is the subproblem corresponding to the full problem
  - Entries (0, j) are needed: correspond to best alignment of prefix of length j of second sequence to empty string
    - Conversely for entries (i, 0)

Are the highroad and lowroad alignments suboptimal?

highroad
lowroad

- No
- highroad and lowroad alignment are defined within the set of all alignments that have the **optimal** score
- Highroad and lowroad alignments may have more spaces than a “middle road” optimal alignment, but they have the same score