

# Randomness: Gibbs Sampling

- Run the Gibbs sampling multiple times to make it more likely you find the global optimal.
- Can increase the use of randomness to further avoid getting stuck in local optima by choosing new  $x_i$  randomly.

Set  $(x_1, x_2, \dots, x_p)$  to random positions in each input string.

**repeat until** the best  $(x_1, x_2, \dots, x_p)$  doesn't change too often

**for**  $i = 1 \dots p$ :

Build a profile  $Q$  using sequences at  $(x_1, x_2, \dots, x_p)$  except  $x_i$

Choose  $x_i$  according to the profile probability distribution of  $Q$  in string  $i$ .