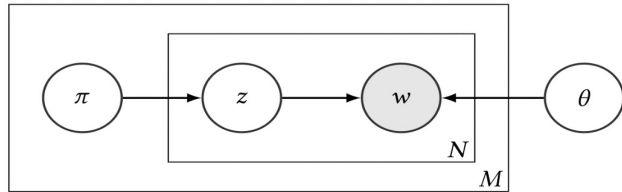


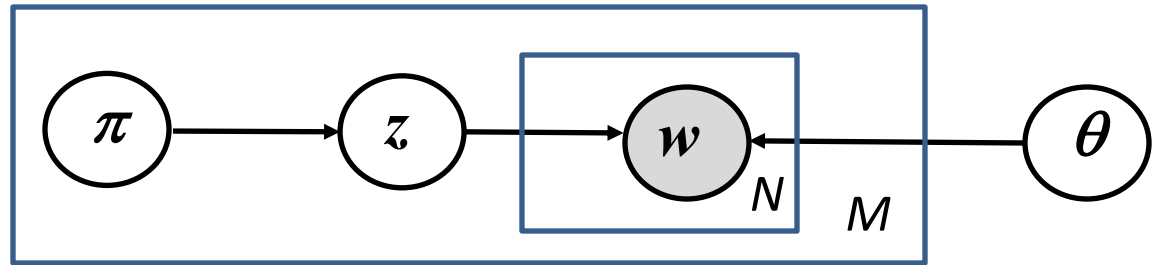
Difference in the likelihood function

- PLSA



$$\begin{aligned}
 p(w_1 \dots w_N | \pi, \theta) &= \prod_{j=1}^N p(z_j, w_j | \pi, \theta) \\
 &= \prod_{j=1}^N \sum_{i=1}^k p(z_j = i | \pi) p(w_j | z_j = i, \theta) \\
 &= \prod_{j=1}^N \sum_{i=1}^k p(z_j = i | \pi) p(w_j | \theta_i)
 \end{aligned}$$

How is this different from the likelihood function of PLSA?



$$\begin{aligned}
 p(\text{doc} | \pi, \theta) = p(w_1 \dots w_N | \pi, \theta) &= \sum_{i=1}^k p(z = i | \pi) p(w_1 \dots w_N | z = i, \theta) \\
 &= \sum_{i=1}^k p(z = i | \pi) \prod_{j=1}^N p(w_j | \theta_i)
 \end{aligned}$$