

$$\begin{aligned} P(D|Q) &\stackrel{\text{rank}}{=} P(Q|D)P(D) \\ &= P(Q|D) \\ &= \prod_{w \in Q} P(w|D) \\ &\stackrel{\text{rank}}{=} \sum_{w \in Q} \log P(w|D) \end{aligned}$$