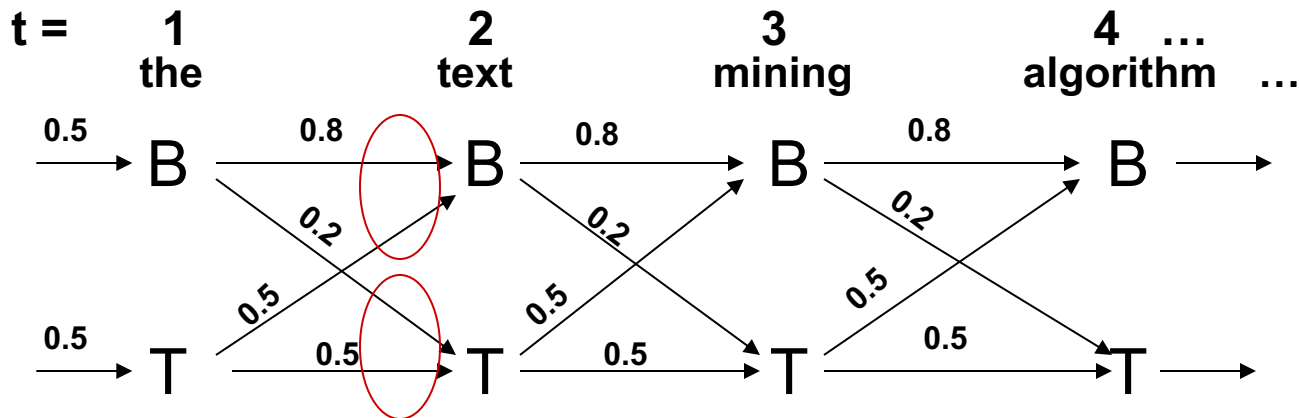


Forward Algorithm: Example

$$p(o_1 \dots o_T | \lambda) = \sum_{i=1}^N \alpha_T(i)$$

$$\alpha_t(i) = b_i(o_t) \sum_{j=1}^N \alpha_{t-1}(j) a_{ji}$$



$$\alpha_1(\mathbf{B}): 0.5 * p(\text{"the"} | \mathbf{B}) \quad \alpha_2(\mathbf{B}): [\alpha_1(\mathbf{B}) * 0.8 + \alpha_1(\mathbf{T}) * 0.5] * p(\text{"text"} | \mathbf{B}) \dots\dots$$

$$\alpha_1(\mathbf{T}): 0.5 * p(\text{"the"} | \mathbf{T}) \quad \alpha_2(\mathbf{T}): [\alpha_1(\mathbf{B}) * 0.2 + \alpha_1(\mathbf{T}) * 0.5] * p(\text{"text"} | \mathbf{T}) \dots\dots$$

$$P(\text{"the text mining algorithm"}) = \alpha_4(\mathbf{B}) + \alpha_4(\mathbf{T})$$