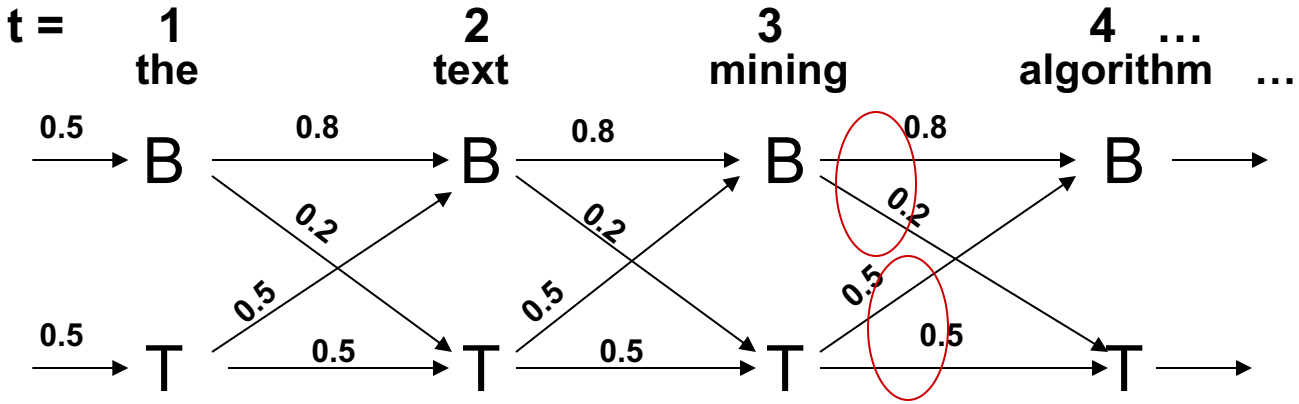
Backward Algorithm: Example

$$p(o_1 ... o_T \mid \lambda) = \sum_{i=1}^{N} \pi_i b_i(o_1) \beta_1(i) = \sum_{i=1}^{N} \alpha_1(i) \beta_1(i) = \sum_{i=1}^{N} \alpha_t(i) \beta_t(i) \quad for\ any\ t$$



. . .

β_3**(B):** 0.8*p("alg"|B)*β_4(B)+ 0.2*p("alg"|T)*β_4(T) β_4**(B):** 1

. . .

β_3**(T):** 0.5*p("alg"|B)*β_4(B)+ 0.5*p("alg"|T)*β_4(T) β_4**(T):** 1

P("the text mining algorithm") = α_1**(B)*** β_1**(B)+** α_1**(T)*** β_1**(T)**
= α_2**(B)*** β_2**(B)+** α_2**(T)*** β_2**(T)**