$$P(t_4 \mid t_2 t_3 t_5 t_6) = \frac{P(t_4 t_6 \mid t_2 t_3 t_5)}{P(t_6 \mid t_2 t_3 t_5)}$$

$$= P(t_4 \mid t_2 t_3 t_5) \cdot \frac{P(t_6 \mid t_2 t_3 t_4 t_5)}{P(t_6 \mid t_2 t_3 t_5)}$$

$$P(t_4 \mid t_2 t_3 t_5)$$

ordre 1

$$P(t_6 \mid t_{i<5}\, t_5) = P(t_6 \mid t_5)$$

Naive Bayes classif

Naive $= \prod_{i=1}^{n} P(w_i | c)$

$$P(c | w_1 \dots w_n) = \frac{P(c) \cdot P(w_1^n | c)}{P(w_1^n)}$$

$P(c) = \frac{3}{4}$

$= \text{compu...}$

$P(C = \text{Med.}) = \frac{1}{4}$

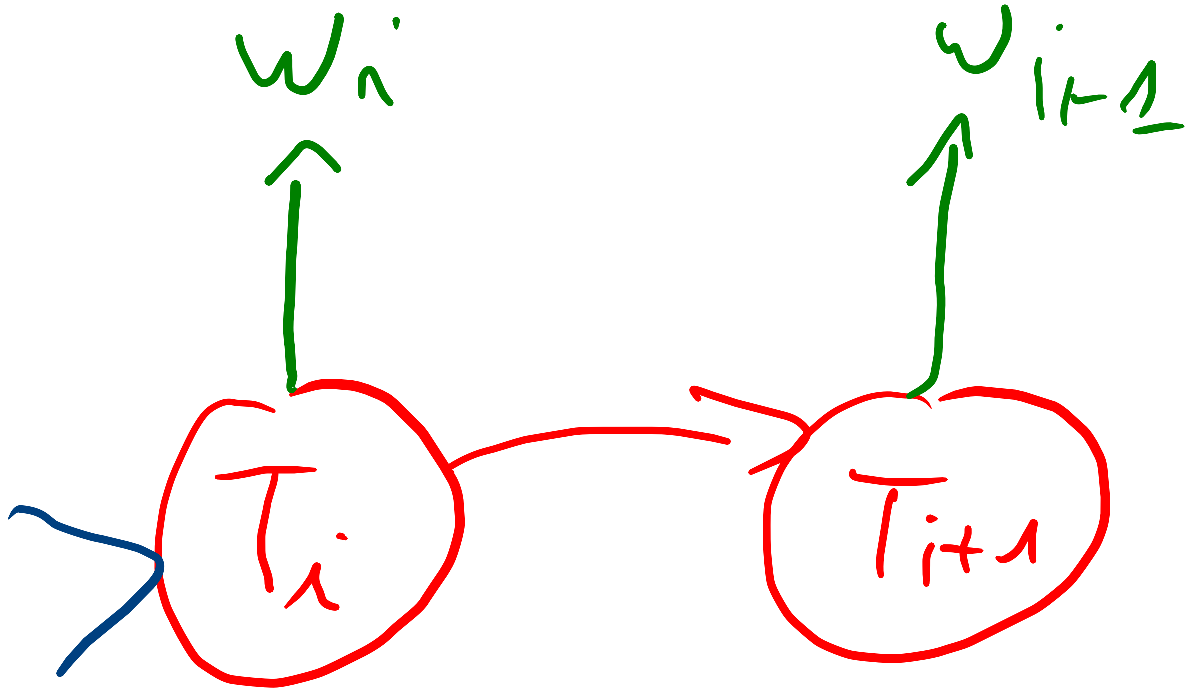
$N = 4$

3

Computer	I don't know
Computer	I don't know either
Computer	Apple I
Medical	You and I ...

$P(I | \text{Computer}) = \frac{3+\alpha}{9+\alpha M}$

order 1



$P_I(t)$

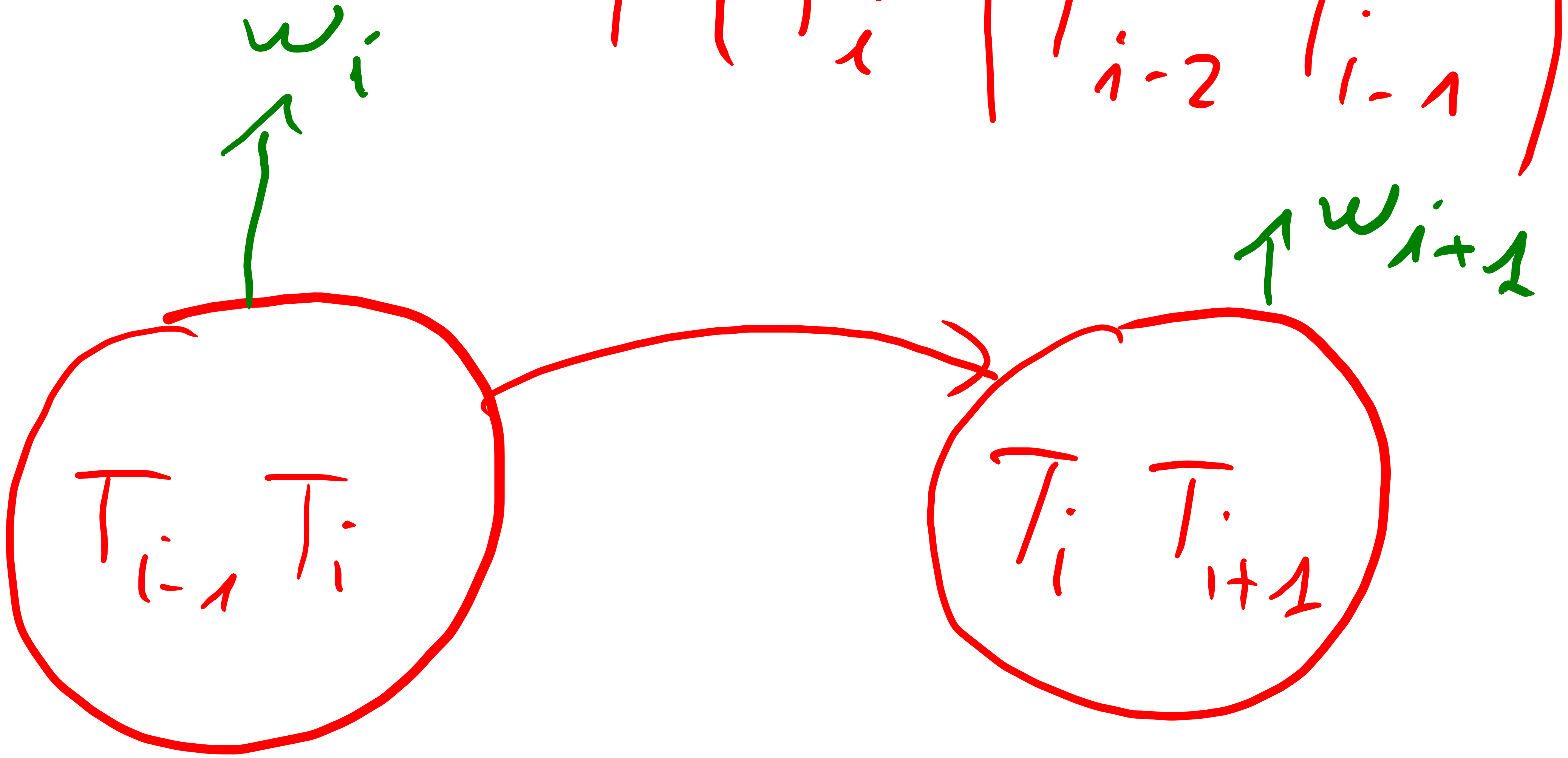
$P_I(t)$

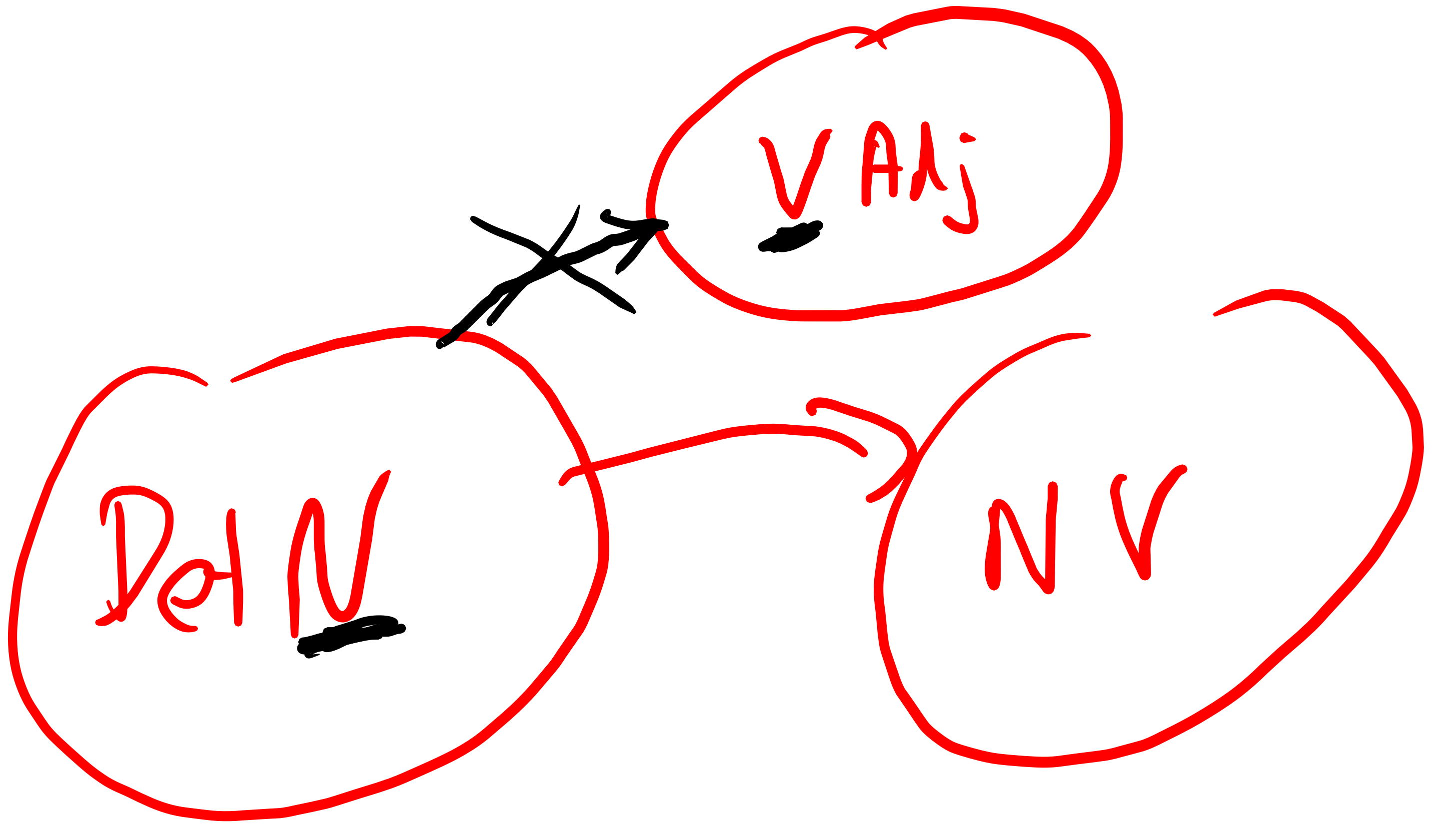
$P_{trans}(t|t')$

$P_{emit}(w|t)$

order 2

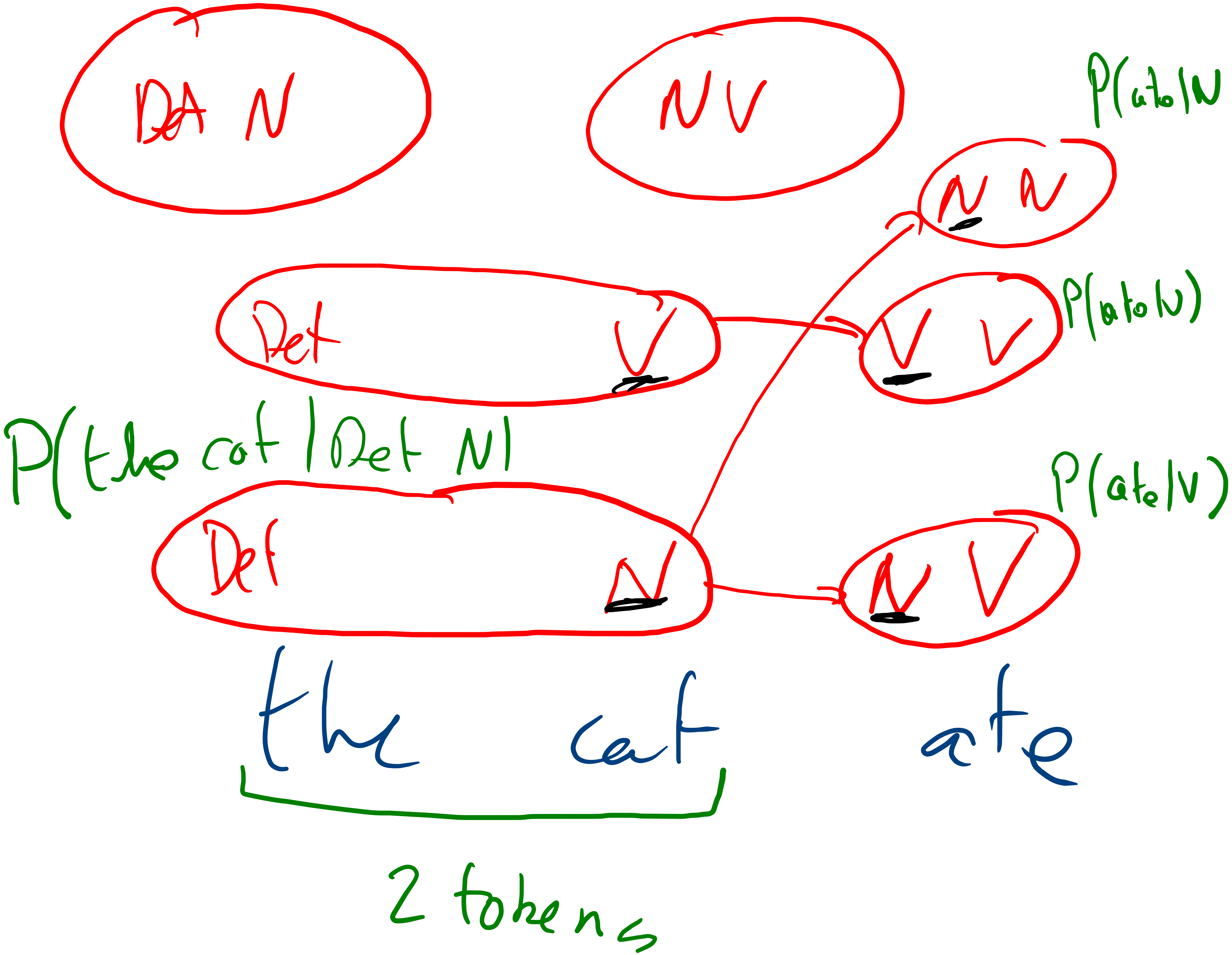
$P(T_i | T_{i-2} T_{i-1})$





$$P(w_1 \dots w_n \; t_1 \dots t_n) = P(t_1) \cdot P(w_1 | t_1) \cdot \prod_{i=2}^{n} P(t_i | t_{i-1}) P(w_i | t_i)$$

$$P(w_i | \dots \dots t_i \dots) = P(w_i | t_i)$$


DA N
N V
P(ate|N
N N
P(ate|V)
Det V
V V
P(the cat | Det N)
P(ate|V)
Det N
N V
the cat
ate
2 tokens

$$AP(q) \qquad q: \; R(q) = \{d_2, d_3, d_5\}$$

$$= \frac{1}{|R(q)|} \sum_{d \in R(q)} P_{@\text{rank of } d}$$

$$= \frac{1}{3}\left(P_{@2} + P_{@3} + P_{@5}\right)$$

$$= \frac{1}{3}\left(\frac{1}{2} + \frac{2}{3} + \frac{3}{5}\right)$$

q

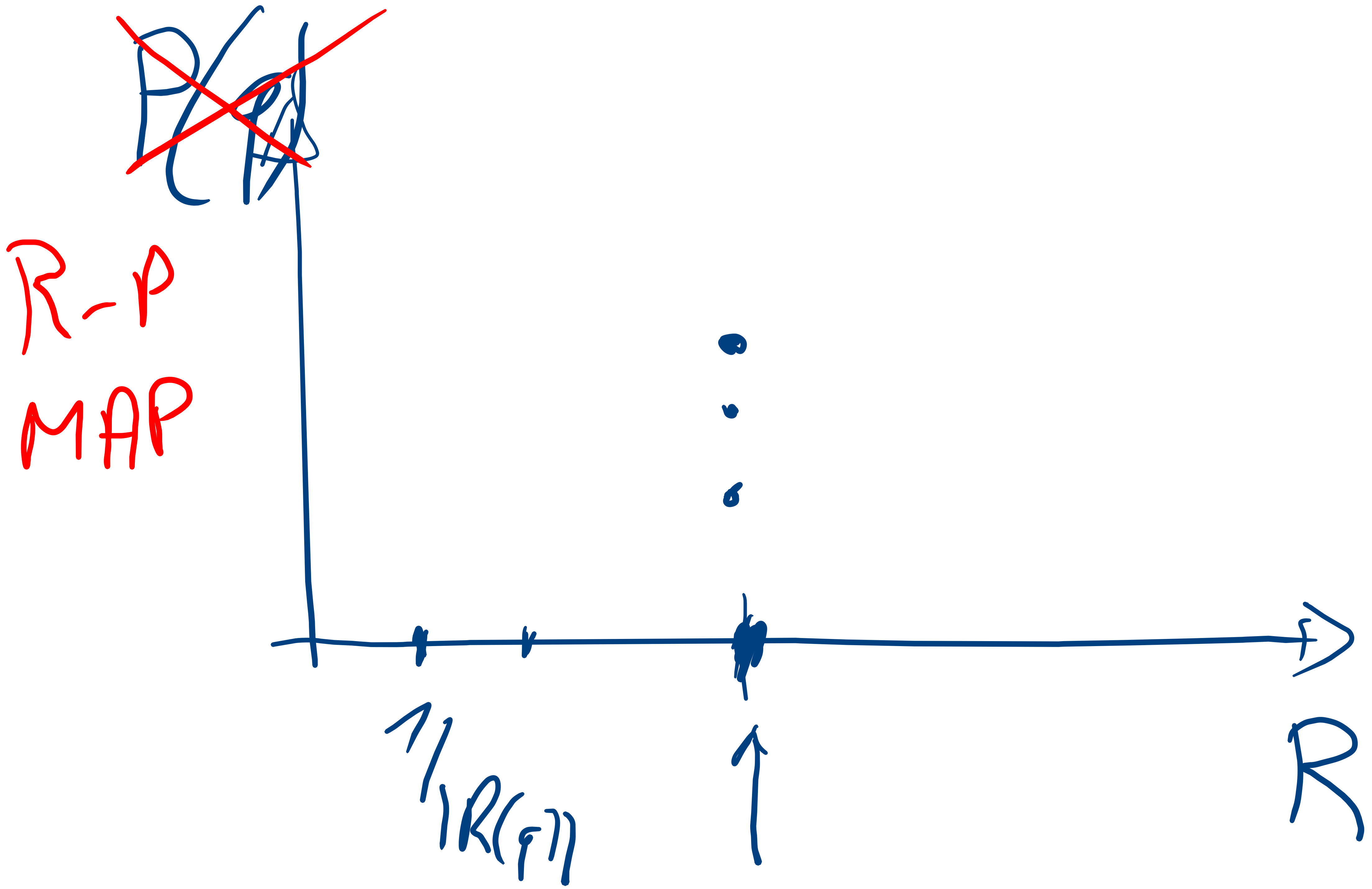
d_1

d_2 ←

d_3 ←

d_4

d_5



q

Σ output:

d_1

d_2

d_3

⋮

d_n

$P(V \mid Det) = 2 \cdot 10^{-4}$

$\rho_3(V)$

$P(can \mid N) = 10^{-5}$

$P(can \mid V) = 7 \cdot 10^{-5}$