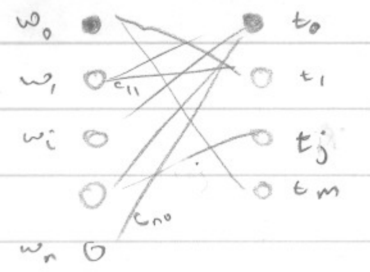

w_0 is (mostly) not wish text

t_0 is "–" template

c_{ij} is the number of times wish i was used in template j

all templates that match stng in the not-wish corpus are connected to w_0

all wishes are linked to t_0

$c(w_i, t_j)$ is the number of times wish i used in template j

The transition matrix:

$$P = \begin{array}{c} \\ w_0 \\ w_1 \\ \vdots \\ w_i \\ \vdots \\ w_n \\ t_1 \\ \vdots \\ t_j \\ \vdots \\ t_m \\ t_0 \end{array} \begin{array}{c} \begin{array}{cccccccccccc} w_0 & w_1 & \cdots & w_i & \cdots & w_n & t_1 & \cdots & t_j & \cdots & t_m & t_0 \end{array} \\ \left[\begin{array}{cccccccc} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & c(w_1,t_1) & c(w_1,t_j) & c(w_1,t_m) & c(w_1,t_0) \\ 0 & 0 & 0 & 0 & \leftarrow & c(w_i,t_j) & \rightarrow & c(w_i,t_0) \\ 0 & 0 & 0 & 0 & \swarrow & \downarrow & \searrow & c(w_n,t_0) \\ c(w_0,t_1) & \nwarrow & \uparrow & \nearrow & 0 & 0 & 0 & 0 \\ c(w_0,t_j) & \leftarrow & c(w_i,t_j) & \rightarrow & 0 & 0 & 0 & 0 \\ c(w_0,t_m) & \swarrow & \downarrow & \searrow & 0 & 0 & 0 & 0 \\ 0 & c(w_1,t_0) & c(w_i,t_0) & c(w_n,t_0) & 0 & 0 & 0 & 0 \end{array}\right] \end{array} \underbrace{./\mathrm{sum}(P,1)}_{\text{i.e. row normalize}}$$

Note the block of P excluding the first row + col is symmetric.
$P_{1,1}$ is an absorbing state.

We define R, Q s.t. $P = \begin{pmatrix} I_1 & 0 \\ R & Q \end{pmatrix}$, since we have 1 absorbing state.

We seek to calculate the expected number of steps until the absorbing state is reached, starting from any template.

Define $N = (I - Q)^{-1}$, then $s = N\underline{1}$ (all ones vector) is this quantity.