Computation of the EM Algorithm

- Initialize all unknown parameters randomly
- Repeat until likelihood converges
  - E-step $p(z_{d,w} = j) \propto \pi_{d,j}^{(n)} p^{(n)}(w \mid \theta_j)$

    $p(z_{d,w} = B) \propto \lambda_B p(w \mid \theta_B)$ ←

  - M-step

$\sum_{j=1}^{k} p(z_{d,w} = j) = 1$

What's the normalizer for this one?

$$\pi_{d,j}^{(n+1)} \propto \sum_{w \in V} c(w,d)(1 - p(z_{d,w} = B)) p(z_{d,w} = j)$$

$$p^{(n+1)}(w \mid \theta_j) \propto \sum_{d \in C} c(w,d)(1 - p(z_{d,w} = B)) p(z_{d,w} = j)$$

$\forall d \in C, \sum_{j=1}^{k} \pi_{d,j} = 1$

$\forall j \in [1,k], \sum_{w \in V} p(w \mid \theta_j) = 1$

In general, accumulate counts, and then normalize