(A)
Posterior probabilities:
$PP_e^{(i)}(\alpha,\beta) = \mathbb{P}(\chi^{(i)}(u)=\alpha, \chi^{(i)}(v)=\beta \mid \mathscr{D}^{(i)}; T, \Theta)$
0
1
2
...
m
-1
$PP_e^{(i)} =$
u/v	0	1	...	m	-1
0					
1	0		0	0	
...	0	0		0	
m	0	0	0		
-1	0	0	0	0	
$S_{0,0}(e,i) = PP_e^{(i)}(0,0)$
$S_{0,\alpha}(e,i) = \sum_{\alpha\in\Sigma'} PP_e^{(i)}(0,\alpha)$
$S_{\alpha,\alpha}(e,i) = \sum_{\alpha\in\Sigma'} PP_e^{(i)}(\alpha,\alpha)$
$S_{\alpha,-1}(e,i) = \sum_{\alpha\in\Sigma'} PP_e^{(i)}(\alpha,-1)$
$S_{-1,-1}(e,i) = PP_e^{(i)}(-1,-1)$
$S_{0,-1}(e,i) = PP_e^{(i)}(0,-1)$
(B) Expectation-Maximization
E-step
$\forall e \in E(T)$ compute:
$S_{0,0}(e,i)$ $S_{0,\alpha}(e,i)$
$S_{\alpha,\alpha}(e,i)$ $S_{0,-1}(e,i)$
$S_{-1,-1}(e,i)$ $S_{\alpha,-1}(e,i)$
M-step
$\max_{\Theta} \sum_{e\in E(T)} f\left\{ S_{0,0}(e,i), S_{\alpha,\alpha}(e,i), S_{0,\alpha}(e,i), S_{0,-1}(e,i), S_{\alpha,-1}(e,i) \right\}$