

5

$$(1) h_i^{t+1} = g(h_i^t, \text{Agg}(H_{i,t}'))$$

$$= g(h_i^t, \sum_{j \in i} f_{ji}(h_j^t))$$

where $v_j \in N(v_i)$

$$= g(h_i^t, \sum_{j \in N(v_i)} (v_j^t h_j^t))$$

$$(b) f(h_2^t) = [-2, -2]$$

$$f(h_3^t) = [0.2, -2]$$

$$f(h_4^t) = [2, 0]$$

$$\text{Agg}(H_{i,t}') = [0.6, 0.2, 0.2] \begin{bmatrix} [-2, -2] \\ [0.2, -2] \\ [2, 0] \end{bmatrix}$$

$$= [-0.8, 0.8]$$

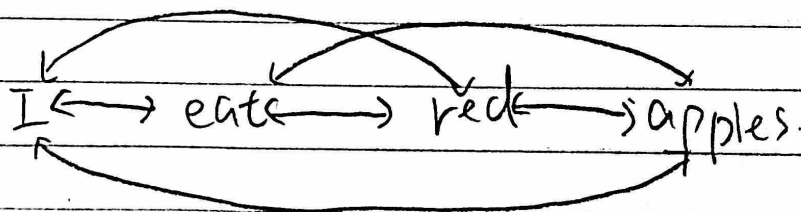
$$h_i^{t+1} = W(h_i^t)^T + \max \{ \text{Agg}(H_{i,t}'), 0 \}$$

$$= [1, 1] \begin{bmatrix} 1 \\ -1 \end{bmatrix} + \max \{ \text{Agg}(H_{i,t}'), 0 \}$$

$$= 0 + [-0.8, 0.8]$$

$$= [0, 0.8]$$

(c)



G has 12 edges