

Base hash matrix

$$Q_{R \times w}[u] = \begin{bmatrix} q_{11} & q_{12} & \cdots & q_{1w} \\ q_{21} & q_{22} & \cdots & q_{2w} \\ \vdots & \vdots & \ddots & \vdots \\ q_{l_i 1} & q_{l_i 2} & \cdots & q_{l_i w} \\ \vdots & \vdots & \ddots & \vdots \\ q_{l_{\max} 1} & q_{l_{\max} 2} & \cdots & q_{l_{\max} w} \\ \vdots & \vdots & \ddots & \vdots \\ q_{R1} & q_{R2} & \cdots & q_{Rw} \end{bmatrix}$$

Hash matrix for  $\text{SFBF}_{\max}$ 

$$Q_{l_{\max} \times w}[u] = \begin{bmatrix} q_{11} & q_{12} & \cdots & q_{1w} \\ q_{21} & q_{22} & \cdots & q_{2w} \\ \vdots & \vdots & \ddots & \vdots \\ q_{l_i 1} & q_{l_i 2} & \cdots & q_{l_i w} \\ \vdots & \vdots & \ddots & \vdots \\ q_{l_{\max} 1} & q_{l_{\max} 2} & \cdots & q_{l_{\max} w} \end{bmatrix}$$

Hash value range

$$\{0, m_{\max} - 1\}$$

Hash matrix for  $\text{SFBF}_i$ 

$$Q_{l_i \times w}[u] = \begin{bmatrix} q_{11} & q_{12} & \cdots & q_{1w} \\ q_{21} & q_{22} & \cdots & q_{2w} \\ \vdots & \vdots & \ddots & \vdots \\ q_{l_i 1} & q_{l_i 2} & \cdots & q_{l_i w} \end{bmatrix}$$

$$\{0, m_i - 1\}$$