

$\sigma(R.x)$     $\sigma(S.y)$

a  
a  
a  
a  
a  
b  
b  
b  
b  
b



a  
a  
b  
b  
c  
c  
d  
d  
e  
e

Max frequency moment MF

MF(R.x) = 5  
MF(S.y) = 2 } use table statistics

Max join partners of max freq.

$$\min \left( \frac{|\sigma(R)|}{MF(R.x)}, \frac{|\sigma(S)|}{MF(S.y)} \right)$$

Max multiplicity per value

$$MF(R.x) * MF(S.y)$$

$\sigma(R.x)$     $\sigma(S.y)$

a  
a  
a  
a  
a  
b  
b  
c  
c  
d



a  
a  
b  
b  
c  
d  
d  
e  
e  
f

$$\text{upper}(|\sigma(R) \bowtie \sigma(S)|) = \min \left( \frac{10}{5}, \frac{10}{2} \right) * 5 * 2 = \mathbf{20} \geq |\sigma(R) \bowtie \sigma(S)| = \mathbf{18}$$