

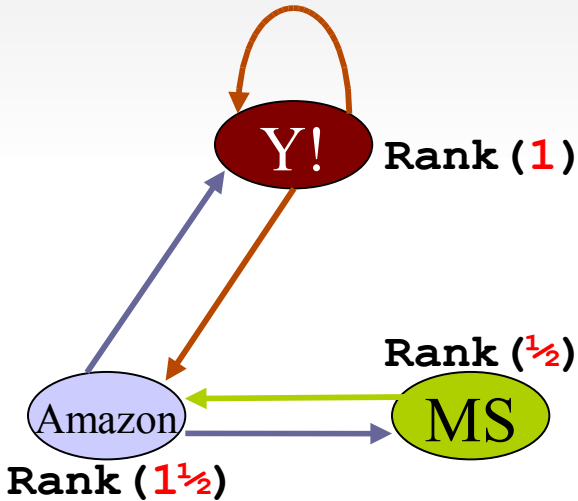
### First Power Iteration:

Highlighted entry shows

Yahoo! giving half of its rank (which = 1) to Amazon.

$$\begin{matrix}
 \mathbf{y} & \mathbf{a} & \mathbf{m} \\
 \mathbf{r} & \mathbf{M} & = \mathbf{r}
 \end{matrix}
 \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}
 \begin{pmatrix} \frac{1}{2} + \frac{1}{2} + 0 \\ \frac{1}{2} + 0 + 1 \\ 0 + \frac{1}{2} + 0 \end{pmatrix}
 = \begin{pmatrix} 1 \\ 1\frac{1}{2} \\ \frac{1}{2} \end{pmatrix}$$

The vector  $r$  represents the rank(s) of  $y$ ,  $a$ , &  $m$  at the beginning and end of each Power Iteration



### Second Power Iteration:

The solution rank vector from the previous power iteration becomes new initial rank vector.

$$\begin{matrix}
 \mathbf{y} & \mathbf{a} & \mathbf{m} \\
 \mathbf{r} & \mathbf{M} & = \mathbf{r}
 \end{matrix}
 \begin{pmatrix} 1 \\ 1\frac{1}{2} \\ \frac{1}{2} \end{pmatrix}
 \begin{pmatrix} \frac{1}{2} + \frac{3}{4} + 0 \\ \frac{3}{4} + 0 + \frac{1}{4} \\ 0 + \frac{3}{4} + 0 \end{pmatrix}
 = \begin{pmatrix} \frac{5}{4} \\ 1 \\ \frac{3}{4} \end{pmatrix}$$

Round:            1            2            3            4            ...    Converge\*

$$\begin{pmatrix} \mathbf{y} \\ \mathbf{a} \\ \mathbf{m} \end{pmatrix} = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} \begin{pmatrix} 1 \\ 3/2 \\ 1/2 \end{pmatrix} \begin{pmatrix} 5/4 \\ 1 \\ 3/4 \end{pmatrix} \begin{pmatrix} 9/8 \\ 11/12 \\ 1/2 \end{pmatrix} \dots \begin{pmatrix} 6/5 \\ 6/5 \\ 3/5 \end{pmatrix}$$

Note\* Convergence occurs when the initial rank vector for iteration  $n-1$  = vector for iteration  $n$ .