

# An Example

There are several things to worry about in regards to this way of defining importance:

- do all page-to-page matrices have eigenvalue 1?
- eigenvectors are not unique (any multiple is also an eigenvector, so how can we come up with a unique importance vector?)
- are there always eigenvectors with all non-negative entries?

The second issue here is easy to resolve: Normalize the eigenvector by dividing it by the sum of its entries. Then each entry represents some fraction of 1. Let's try this out in our simple web:

$$0 = (A - 1I)x = \begin{bmatrix} -1 & \frac{1}{2} & \frac{1}{2} & \frac{1}{3} \\ 0 & -1 & 0 & \frac{1}{3} \\ 0 & \frac{1}{2} & -1 & \frac{1}{3} \\ 1 & 0 & \frac{1}{2} & -1 \end{bmatrix} x$$