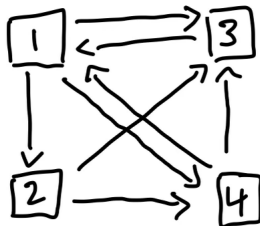


MATH 4310 Lecture Notes (Dylan Tom)

Introduction & Fields



Question: How do we determine the page order for a mini "google"?

1. (Simple Approach) Determine the importance by the number of back links (we expect page 3 should be the top*)
2. (Weighted Approach) Back links from "important" pages should weigh more. Let the "score" of a page be the sum of the scores of its back links.
3. Prevent undue influence by one page linking to too many other pages. If page j contains n_j links, one of which is page k , then boost the score of page k by $\frac{x_j}{n_j}$ where x_j is the score of page j

In our example,

$$\begin{aligned}x_1 &= \frac{1}{1}x_3 + \frac{1}{2}x_4 \\x_2 &= \frac{1}{3}x_1 \\x_3 &= \frac{1}{3}x_1 + \frac{1}{2}x_2 + \frac{1}{2}x_4 \\x_4 &= \frac{1}{3}x_1 + \frac{1}{2}x_2\end{aligned}$$

Answer: $x_1 = \frac{12}{31}$ $x_2 = \frac{4}{31}$ $x_3 = \frac{9}{31}$ $x_4 = \frac{6}{31}$

*We have shown that page 1 should be ranked higher than 3, so our intuition wasn't correct.