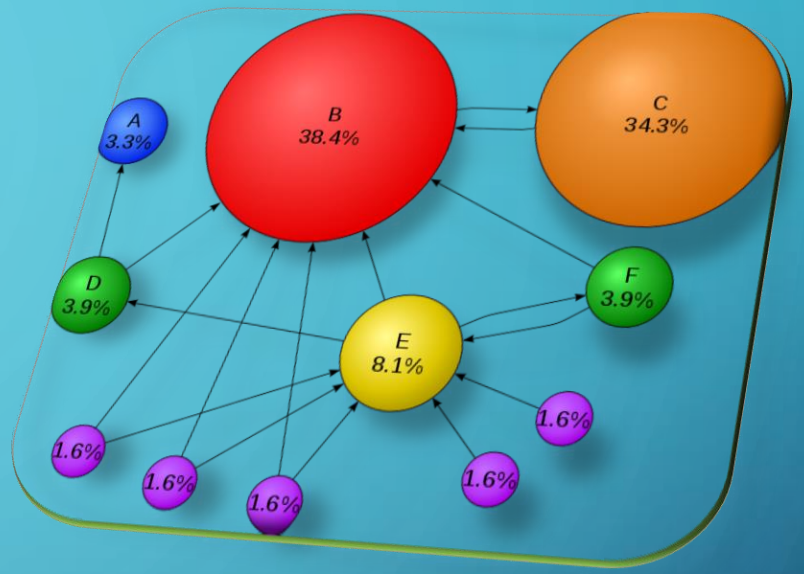
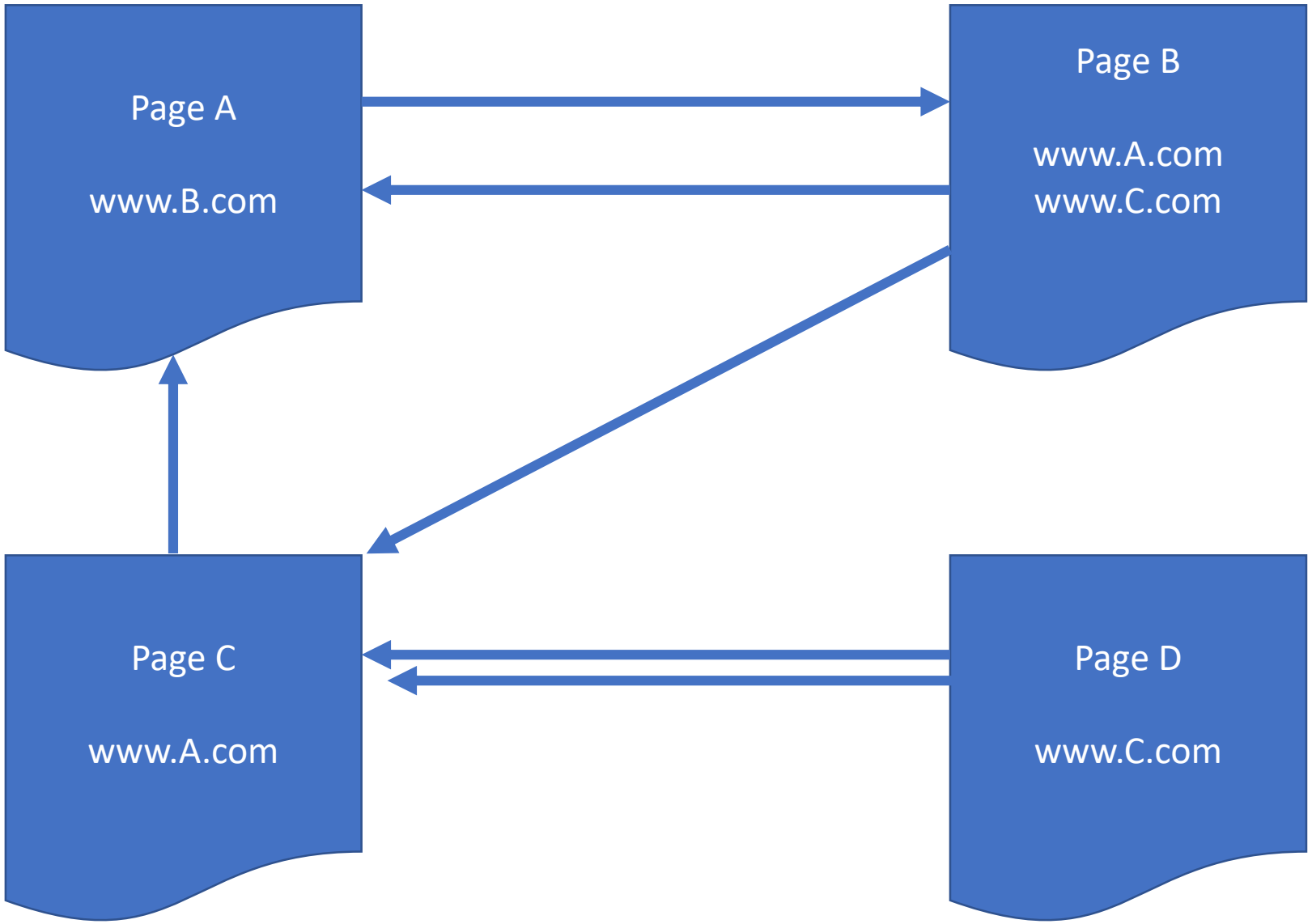


PAGERANK ALGORITHM

RANK WEBSITES FROM SEARCH ENGINE RESULTS

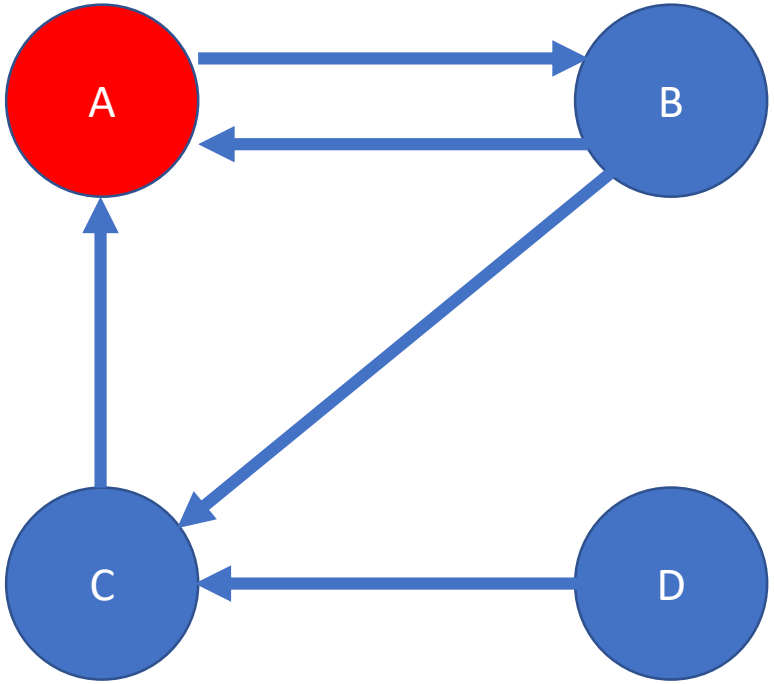

Page A
www.B.com
Page B
www.A.com
www.C.com
Page C
www.A.com
Page D
www.C.com

PageRank

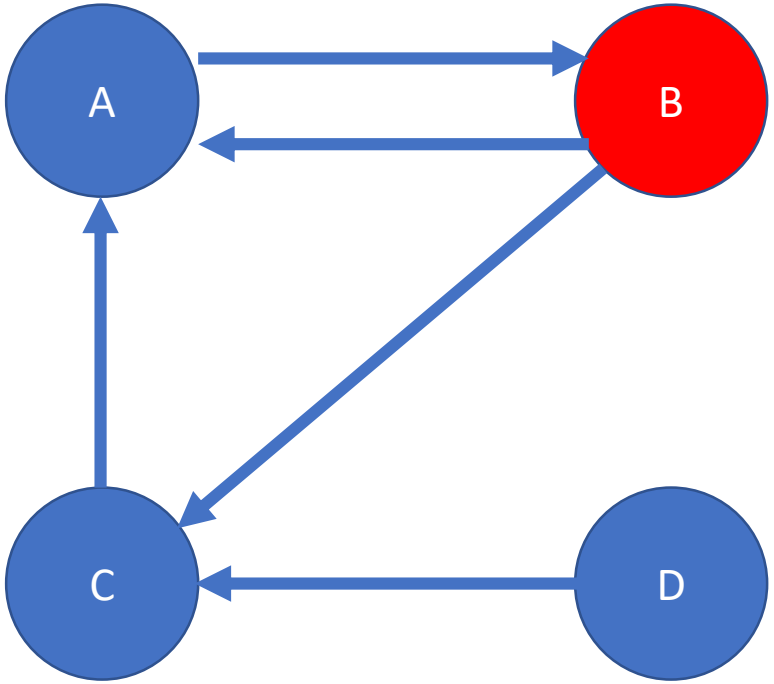
$$PR(p_i) = \frac{1-d}{N} + d \sum_{p_j \in M(p_i)} \frac{PR(p_j)}{L(p_j)}$$

General Formula

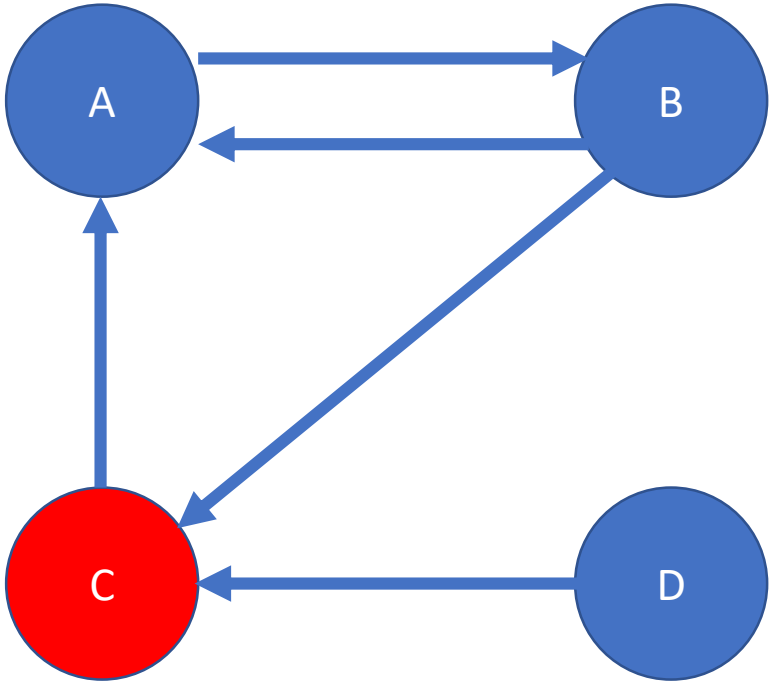
$$\text{PageRank}(A) = \frac{\text{PageRank}(B)}{\text{Outbound links}(B)} + \frac{\text{PageRank}(C)}{\text{Outbound links}(C)} + \frac{\text{PageRank}(D)}{\text{Outbound links}(D)} + \frac{\text{PageRank}(E)}{\text{Outbound links}(E)} + \cdots$$



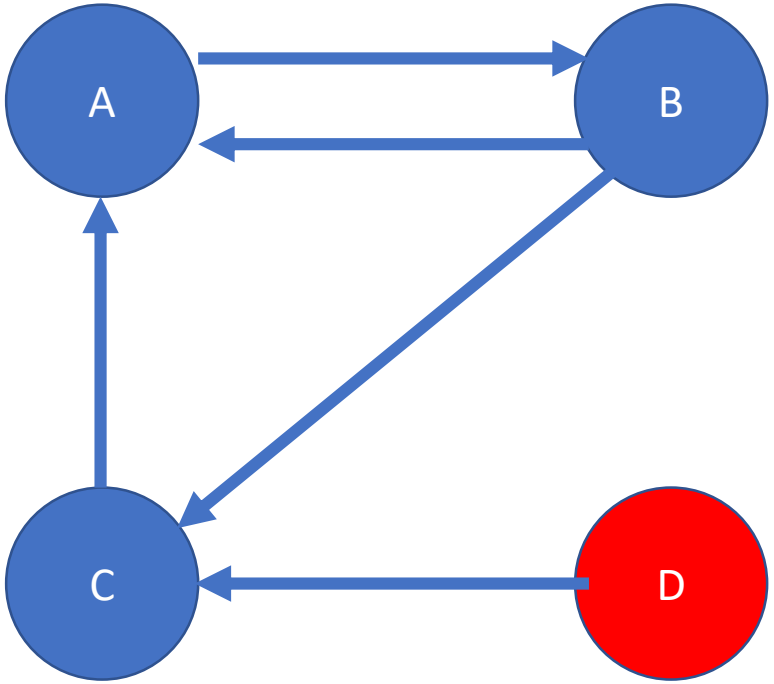
$$\text{PageRank}(A) = \frac{\text{PageRank}(B)}{\text{Count}(2)} + \frac{\text{PageRank}(C)}{\text{Count}(1)}$$



$$\text{PageRank}(B) = \frac{\text{PageRank}(A)}{\text{Count}(1)}$$



$$\text{PageRank}(C) = \frac{\text{PageRank}(B)}{\text{Count}(2)} + \frac{\text{PageRank}(D)}{\text{Count}(1)}$$



PageRank(D) = 0

Damping Factor

- The probability that a user will loose interest in following a chain of links and do another search.

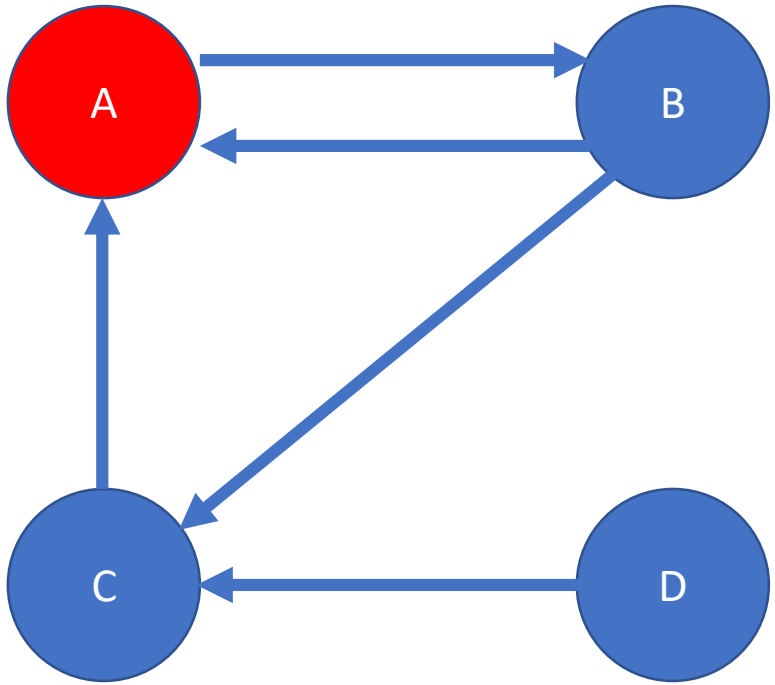
- The recommended default value is 0.85.

$$PR(A) = (1-d) + d * (PR(T1)/C(T1) + \ldots + PR(TN)/C(TN))$$

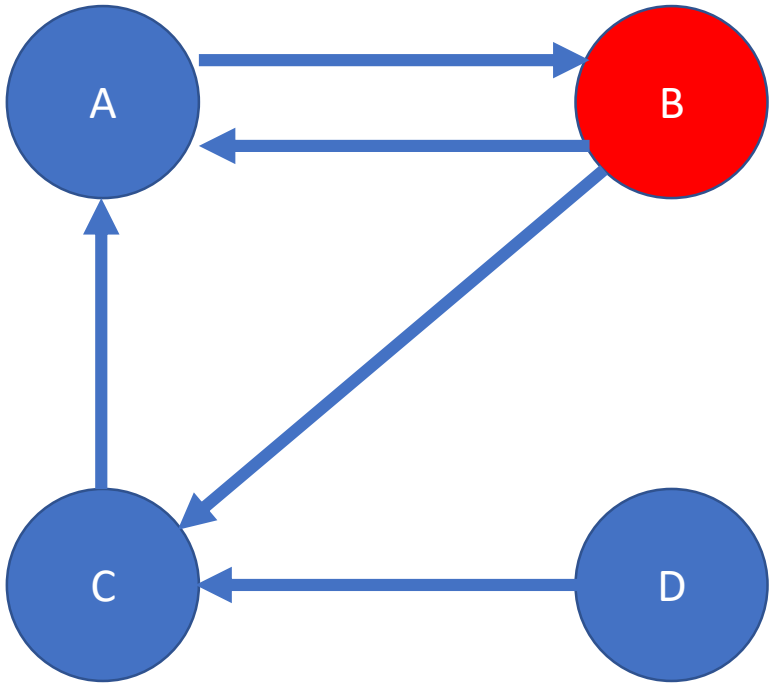
$$= (1-0.85) + 0.85 * (PR(B)/2 + PR(C)/1)$$

$$= (1-0.85) + 0.85 * (1 / 2 + 1 / 1)$$

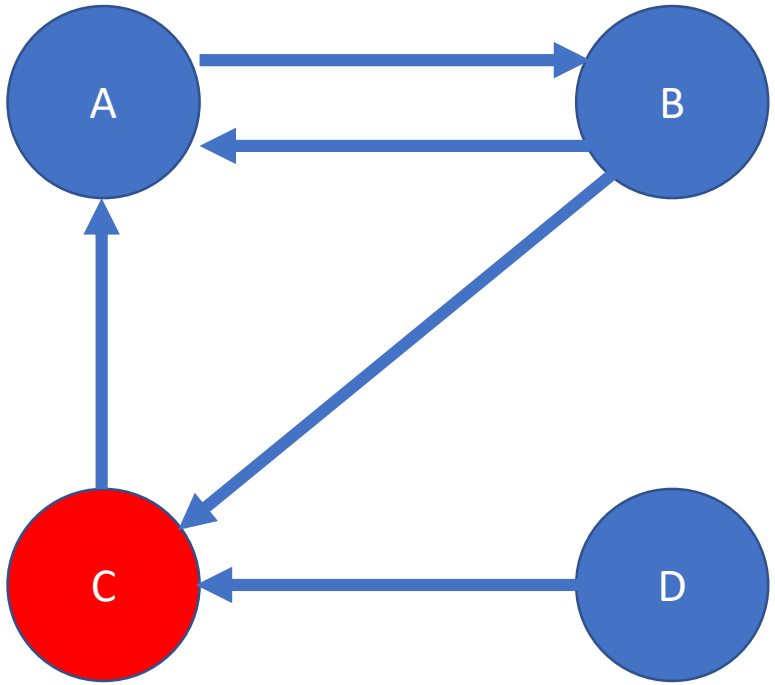
$$= 1.425$$



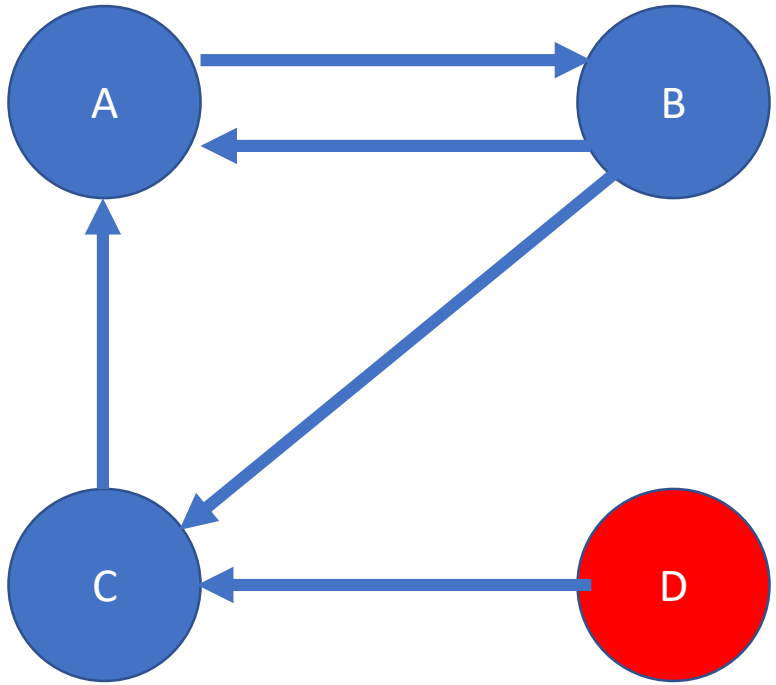
$$PR(B) = (1 - 0.85) + 0.85 * (PR(A) / 1)$$
$$= (1 - 0.85) + 0.85 * (1.425 / 1)$$
$$= 1.361$$



$$PR(C) = (1-0.85) + 0.85 * (PR(B)/2 + PR(D)/1)$$
$$= (1-0.85) + 0.85 * (1.361 / 2 + 1 / 1)$$
$$= 1.597$$



$$PR(D) = (1-0.85) + 0.85 * 0$$
$$= 0.15$$



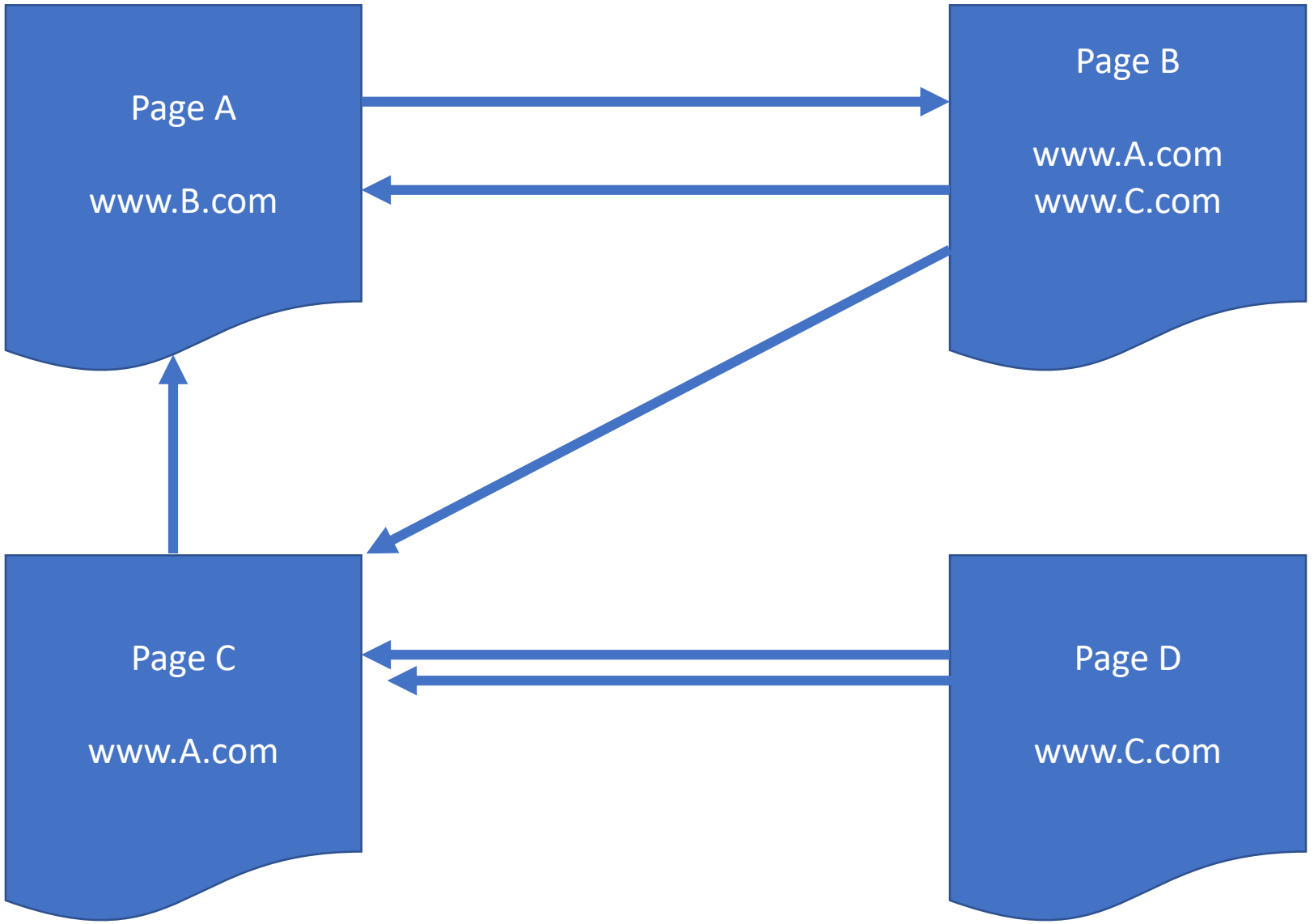
Iteration 1

PR(A) = 1.425

PR(B) = 1.361

PR(C) = 1.597

PR(D) = 0.15



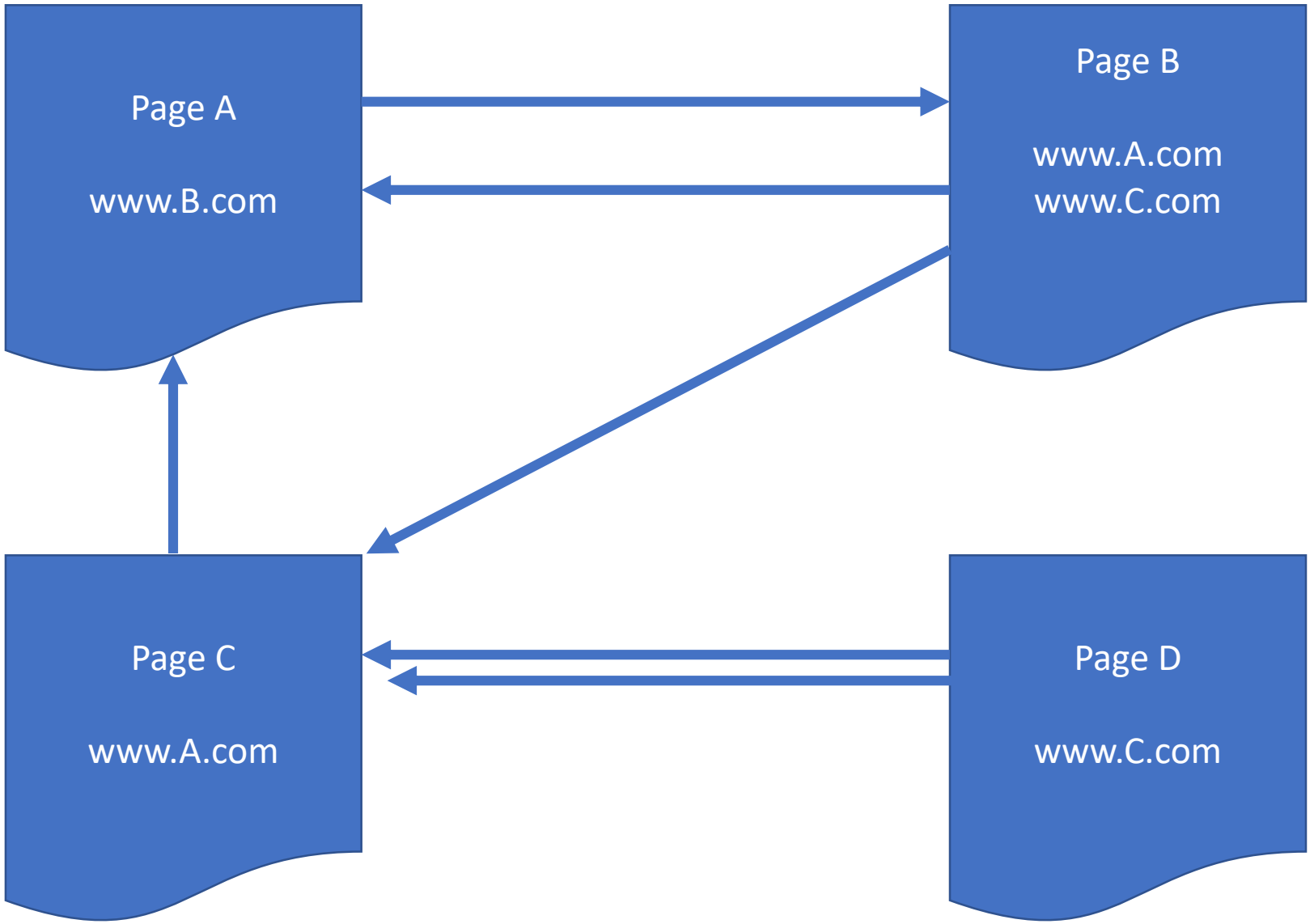
Iteration 2

PR(A) = 2.070

PR(B) = 1.909

PR(C) = 1.087

PR(D) = 0.15



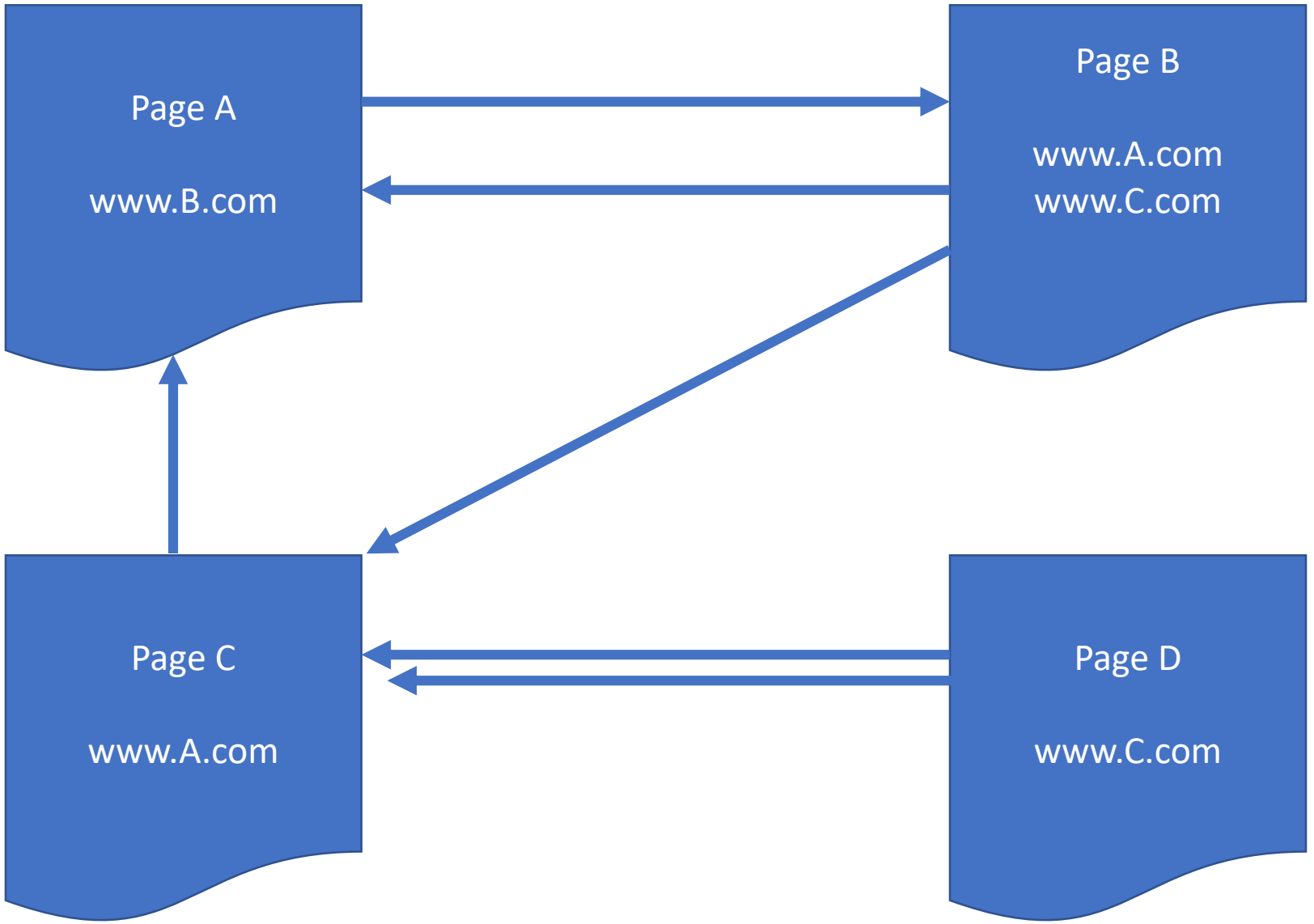
Iteration 3

PR(A) = 1.887

PR(B) = 1.754

PR(C) = 1.023

PR(D) = 0.15



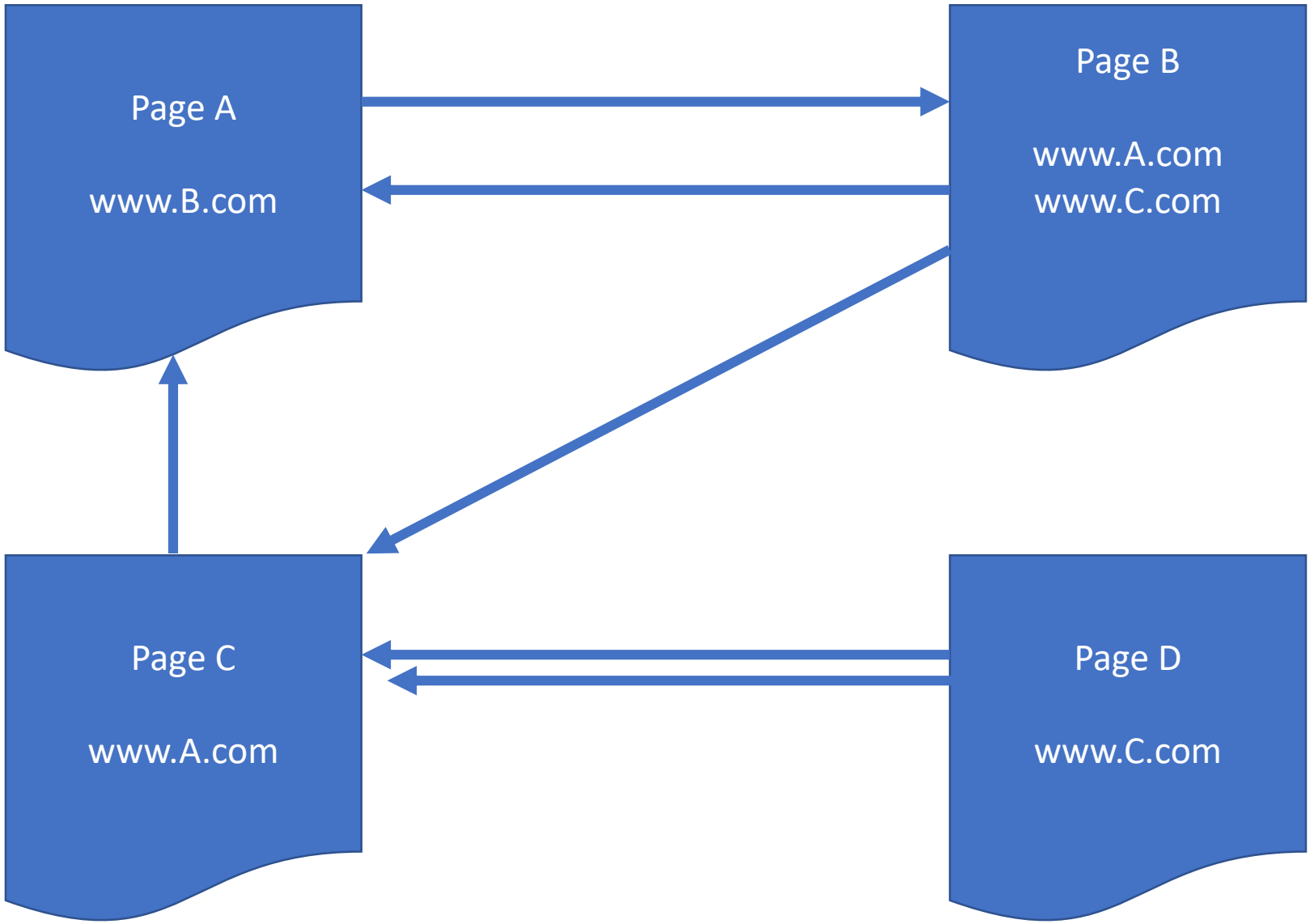
Iteration 4

PR(A) = 1.765

PR(B) = 1.650

PR(C) = 0.979

PR(D) = 0.15



Equilibrium
(iteration 17)

PR(A) = 1.519

PR(B) = 1.441

PR(C) = 0.890

PR(D) = 0.15