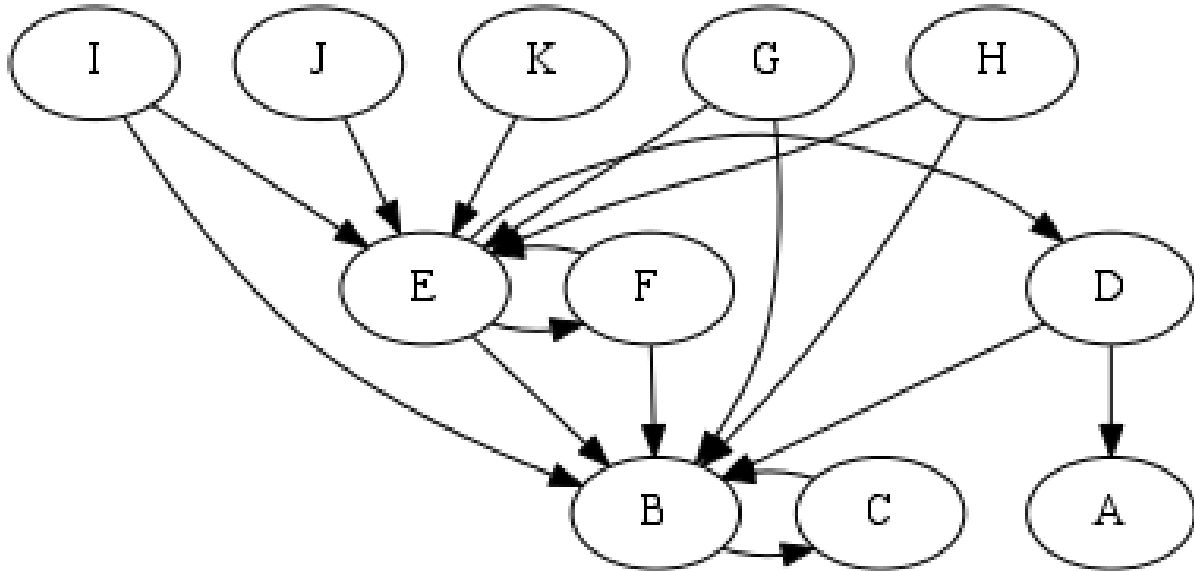


# CPSC 320 Notes, PageRank

January 21, 2015

Imagine the following graph represents the “follows” structure of CS department faculty on Twitter.



Discuss these questions with your neighbour:

- Who’s the biggest bigwig in the group?
- Who’s the second biggest bigwig in the group?
- How should an algorithm decide?
- Which one is Steve? (Just kidding.)

Now, cut out the following handy-dandy randomizers and follow the algorithm on the back of the page:

A	B	C	D	E	F	G	H	I	J	K	X
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1. Repeat until Steve calls time:
  - (a) Pick a random person  $p$  (among A–K) to start on.
  - (b) Put a tick mark next to  $p$ .
  - (c) Choose at random among A–E and X.
  - (d) While you did **not** choose X
    - i. Choose at random among the people  $p$  follows.
    - ii. Make the chosen person your new value of  $p$ .
    - iii. Put a tick mark next to  $p$  (the new  $p$ ).
    - iv. Choose at random among A–E and X.

(Note that A–E are not important in the “Choose at random among A–E and X” step. All that matters is the  $\frac{1}{6}$  chance of stopping.)

## 1 Challenge Problem

What is the expected number of tick marks you write during a single run of this algorithm (i.e., all the steps beneath “Repeat until Steve calls time”)?