

# Exercises: PageRank

October 18, 2016

## Task 1

Compute the PageRank values for the following graph for three iterations using  $q = 0.5$ .

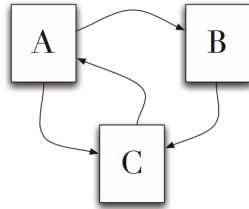


Figure 1: Web graph for Task 1

## Algorithm

- All pages are given equal page rank  $\frac{1}{T}$  (where  $T$  is the number of pages)
- Substitute the values and compute new PageRank values using Equation 1
- Repeat for the required number of iterations

$$PR(a) = \frac{q}{T} + (1 - q) \sum_{i=1}^n \frac{PR(p_i)}{L(p_i)} \quad (1)$$

## Solution

Page	$L(p)$	Iteration 0	Iteration 1	Iteration 2	Iteration 3
A					
B					
C					

Table 1: PageRank values.

## Task 2

Compute the PageRank values for the following graph for three iterations using  $q = 0.15$ .

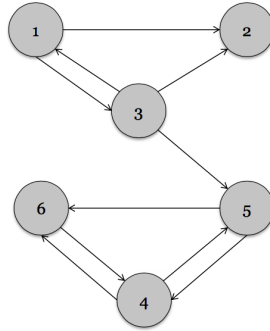


Figure 2: Web graph for Task 2

## Algorithm

- All pages are given equal page rank  $\frac{1}{T}$  (where  $T$  is the number of pages)
- Substitute the values and compute new PageRank values using Equation 2
- Repeat for the required number of iterations
- Notice that node 2 is a rank sink (no outgoing links); pretend that it links to all other nodes

$$PR(a) = \frac{q}{T} + (1 - q) \sum_{i=1}^n \frac{PR(p_i)}{L(p_i)} \quad (2)$$

## Solution

Page	$L(p)$	Iteration 0	Iteration 1	Iteration 2
1				
2				
3				
4				
5				
6				

Table 2: PageRank values.