Week 9: Link Analysis

# Assignment 1: PageRank

a) Compute the pageRank score for the following network. Start by writing down the adja- cency matrix. Assume a random jump probability of 0.15.

|  |  |  |  |
| --- | --- | --- | --- |
| adjacency matrix | A | B | C |
| A | 0 | 1 | 0 |
| B | 1 | 0 | 0 |
| C | 0 | 1 | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| transition matrix | A | B | C |
| A | 0.05 | 0.9 | 0.05 |
| B | 0.9 | 0.05 | 0.05 |
| C | 0.05 | 0.9 | 0.05 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **A** | **B** | **C** |
| **t = 1** | 0.3333 | 0.6167 | 0.0500 |
| **t = 2** | 0.5742 | 0.3758 | 0.0500 |
| **t = 3** | 0.3695 | 0.5805 | 0.0500 |
| **t = 4** | 0.5435 | 0.4065 | 0.0500 |
| **t = 5** | 0.3956 | 0.5544 | 0.0500 |
| **t = 6** | 0.5213 | 0.4287 | 0.0500 |
| **t = 7** | 0.4144 | 0.5356 | 0.0500 |
| **t = 8** | 0.5052 | 0.4448 | 0.0500 |
| **t = 9** | 0.4280 | 0.5220 | 0.0500 |
| **t = 10** | 0.4937 | 0.4563 | 0.0500 |
| **t = 11** | 0.4379 | 0.5121 | 0.0500 |
| **t = 12** | 0.4853 | 0.4647 | 0.0500 |
| **t = 13** | 0.4450 | 0.5050 | 0.0500 |
| **t = 14** | 0.4793 | 0.4707 | 0.0500 |
| **t = 15** | 0.4501 | 0.4999 | 0.0500 |
| **t = 16** | 0.4749 | 0.4751 | 0.0500 |
| **t = 17** | 0.4538 | 0.4962 | 0.0500 |
| **t = 18** | 0.4717 | 0.4783 | 0.0500 |
| **t = 19** | 0.4565 | 0.4935 | 0.0500 |

b) PageRank is initialized with identical scores for each web page. What would be a better method to initialize pageRank so that less iterations are necessary?

You can consider the amount of links to a node. At first, give each node one share. Then give each node another share for every incoming link. Using this technique, A would get 2 shares, B three shares and C one share, leading to default values of

A = 0.33

B = 0.5

C = 0.17

# Assignment 2: (Programming) Link Analysis

Print the ranking of Wikipedia titles and snippets in Wikipedia together with its NDCG value for the queries:

a) “ LINKTO schnitzelmitkartoffelsalat ”

query: LINKTO schnitzelmitkartoffelsalat

Hommingberger Gepardenforelle:

der englische Begriff Nigritude ultramarine und der Versuchsaufbau von Schnitzelmitkartoffelsalat

Liste geflugelter Worte/H: ̈

der englische Begriff Nigritude ultramarine und der Versuchsaufbau von Schnitzelmitkartoffelsalat

Schnitzelmitkartoffelsalat:

Der Begriff Schnitzelmitkartoffelsalat ist ein Testbegriff von Webmaster um die Eigenschaften von Suchmaschine zu erforschen Er wurde am 15 November

SEO Contest:

Such und Bewertungsverfahren aufmerksam werden Bekannte Wettbewerbsthemen Hommingberger Gepardenforelle Schnitzelmitkartoffelsalat

Englische Sprache:

der englische Begriff Nigritude ultramarine und der Versuchsaufbau von Schnitzelmitkartoffelsalat