

MCS-381 Social Computing  
Project 2: PageRank and Link Analysis  
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We implemented the Page Rank algorithm created by Larry Page and Sergey Brin using a damping factor of 0.85 and an equilibrium factor of 0.000000002, with 100 iterations. To choose a smaller equilibrium or larger # of iterations is to lessen the percentage of rounds out of the requested number of iterations that are actually performed. Below are the first 10 pages (ranked in descending order) of each graph with the time it took to run each graph with the specified values above. The full results of each graph are submitted as individual files, with this one, on Moodle. The results include the number of iterations hit, the rankings of each page, and the time it took to rank the pages.

dolphins.txt

Time: 0.004

```
iterations hit: 93
1 id: "Grin" rankScore: 0.03214448249476021
2 id: "Jet" rankScore: 0.031728132665753465
3 id: "Trigger" rankScore: 0.03129934833500013
4 id: "Web" rankScore: 0.03009536363992522
5 id: "SN4" rankScore: 0.029875329175134198
6 id: "Topless" rankScore: 0.029514194154213063
7 id: "Scabs" rankScore: 0.028423061162800856
8 id: "Patchback" rankScore: 0.026458542479696416
9 id: "Gallatin" rankScore: 0.026156869092635423
10 id: "Beescratch" rankScore: 0.024650709972619825
...
```

karate.txt

Time: 0.004

```
iterations hit: 99
1 id: 34 rankScore: 0.10091917111765979
2 id: 1 rankScore: 0.09699727483303222
3 id: 33 rankScore: 0.07169321808930794
4 id: 3 rankScore: 0.05707850289142309
5 id: 2 rankScore: 0.05287691812381061
6 id: 32 rankScore: 0.037158083110921995
7 id: 4 rankScore: 0.03585985382818795
8 id: 24 rankScore: 0.03152251147815866
9 id: 9 rankScore: 0.029766052782497512
10 id: 14 rankScore: 0.02953645285339418
...
```

polblogs.txt

Time: 0.093

```
iterations hit: 94
1 id: 155 rankScore: 0.01883567472868529
2 id: 55 rankScore: 0.01598536110774225
3 id: 1051 rankScore: 0.013253402116861953
4 id: 855 rankScore: 0.013113382170234727
5 id: 641 rankScore: 0.013052155007687923
6 id: 1153 rankScore: 0.011453305234728782
7 id: 963 rankScore: 0.011244700570668056
8 id: 729 rankScore: 0.011070190102112375
9 id: 1245 rankScore: 0.009379794047452632
10 id: 798 rankScore: 0.009042242845923013
...
```

Toy Example: Now we provide a small graph whose Page Rank Score was calculated by hand and tested via the algorithm (they were the same).

Test file:

site0	0	site1	0
site1	0	site0	0
site0	0	site3	0
site3	0	site0	0
site1	0	site3	0
site3	0	site1	0
site3	0	site4	0
site4	0	site3	0
site3	0	site2	0
site2	0	site3	0

Time: 0.002

```
iterations hit: 100
1 id: "site3" rankScore: 0.38613758429609607
2 id: "site0" rankScore: 0.19487692876281446
```

```
3 id: "site1" rankScore: 0.19487692876281446
4 id: "site4" rankScore: 0.11205423535076936
5 id: "site2" rankScore: 0.11205423535076936
Time taken: 0.002
```