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|--------------|-------------|--|----|
| WT21-B37-76 | 0.002694474 | home page of The Economist newspaper | N |
| WT21-B37-75 | 0.001533179 | The Economist Newspaper | N |
| WT25-B39-116 | 0.001468501 | some information on security assurance | I |
| WT23-B21-53 | 0.001373525 | web dev team of the page | RP |
| WT24-B26-10 | 0.001276157 | What is Psychiatry Star? And the team that runs it | RP |
| WT24-B40-171 | 0.001245293 | The Evening News on the Internet every weeknight with the day's top stories featured | N |
| WT23-B39-340 | 0.001242913 | Streetlink financial report :: reports of various firms | I |
| WT23-B37-134 | 0.001205421 | information page having disclaimer and copyright info of health Dept of WA | RP |
| WT08-B18-400 | 0.001144777 | disclaimer of tdbank | RP |
| WT13-B06-284 | 0.001136558 | development team of lawlead.com | RP |

Table1: PageRank of the documents with description of the page and category

The top 10 pages sorted by PageRank can be divided into three categories:

- News portal (N) i.e. pages containing daily news reports
- Information portal (I) i.e. pages containing some good information on a key topic
- Related to pages (RP) having good info and a high PageRank i.e. teams that run the page or the disclaimers and copyright information

The pages in the first two categories are providing information that a lot of users will actually look for. The news portals like WT21-B37-75 or WT24-B40-171 contain daily news reports on various hot topics and that will be required and accessed by different user communities. So they are linked with a lot of pages and with higher page ranks. The information portals like WT23-B39-340 also contain information/links on financial reports of various companies that might be required by a large user community and by the companies for whom the page has a report. So it might be linked to the pages of those companies or the portals that analyze financial reports which have a high PageRank.

The pages in the last category are something that a user may not like to have a look till the user is specifically looking for that information. They might be a result of very specific queries looking for the information on the page but not to the queries that are looking for information on the pages that these pages are linked to. E.g. pages like WT23-B21-53 or WT13-B06-284 contains the information of dev teams of the pages that are highly ranked, so their PageRank proceed downwards and these pages get a high PageRank. Also pages like WT23-B37-134 and WT08-B18-400 contain disclaimer and copyright information that are in-linked with a lot of pages that may have high PageRank as the information contained might be required on each parent page.

The formula to get the PageRank used here is:

$$PR = a + b + \sum d * PR(p) / \text{outlinks}(p)$$

where $PR(p)$ is the PageRank of parent i.e. the page that directs to this page

$\text{outlinks}(p)$ is the number of out-links of the parent

d is the teleportation factor(constant)

$a = (1-d)/N$ which is a constant for a set

$b = d * \text{sinkPR} / N$ which is a constant for an iteration
sinkPR is the sum of PageRanks of the sinks

So the main factor that affects the PageRank of the pages is the sum of ratio of PageRank of the parent and its out-links and subsequently the ratio of PageRank and out-link of each page.

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|--------------|------|-------------|
| WT21-B37-76 | 2568 | 0.002694474 |
| WT18-B29-37 | 2269 | 8.25E-05 |
| WT01-B18-225 | 2260 | 9.55E-04 |
| WT23-B27-29 | 1940 | 3.85E-04 |
| WT21-B37-75 | 1704 | 0.001533179 |
| WT27-B34-57 | 1257 | 5.06E-04 |
| WT27-B32-30 | 1255 | 5.01E-04 |
| WT08-B19-222 | 1041 | 6.50E-04 |
| WT08-B18-400 | 1011 | 0.001144777 |
| WT10-B36-88 | 946 | 2.02E-04 |

Table1: In-Links and PageRank of the documents

If we look at the first two rows, they have relatively small gap in number of in-links (299) but the difference of the PageRank is quite huge (0.002611974).

The highest and lowest PageRank of a page and its ratio with its out-links for the two documents along with the average of the ratios are as below:

WT21-B37-76::

Highest PR and ratio to out-link:

WT21-B37-75::0.0015331790999983839
3.0663581999967676E-4

Lowest PR and ratio to out-link:

WT21-B40-104::1.5068566125094735E-6
3.013713225018947E-7

Average of the ratios of all in-links:

1.2337213310609566E-6

WT18-B29-37::

Highest PR and ratio to out-link:

WT18-B28-378::3.0657410364221603E-6
1.5328705182110801E-6

Lowest PR and ratio to out-link:

WT18-B30-113::1.5068566125094735E-6
7.534283062547367E-7

Average of the ratios of all in-links:

5.587232383313982E-7

The highest contributing page for WT21-B37-76 has a way higher value than that of WT18-B29-37. But its vice-versa for the lowest contributors even though they have same PageRank. Here the number of out-links act as a factor. However, WT21-B37-76 has a higher average ratio of PageRank to out-links than average ratio of WT18-B29-37. So even if the ratio is evenly distributed and we try to scale down the

number of in-links, document WT21-B37-76 will have a higher PageRank than WT18-B29-37, keeping other factors constant, because the contributing pages have a higher ratio. So it's the PageRank of the parent, its out-links and the number of in-links from a highly ranked page define the PageRank of a page and not just the number of in-links alone.