Google
Page Rank Algorithm

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AGENDUM

- Facts
- Understanding PageRank
- Simple Calculation of PageRank
- Analysis of PageRank Algorithm
- Case Discussion
- Practical Implementation
- References

FACTS

Page Rank :

- Developed by Larry Page and Sergey Brin in 1998
- Trademark of Google
- Patented by Stanford University
- Back bone of Google Search Technology

UNDERSTANDING PAGERANK

Page Rank Technology :-

- Ranks pages based on the number of other pages that link to it
- Gives an indication of the relative importance of a page.
- Hence, an appropriate SERP listing
- Calculated by nature and number of back links
- Scale : 0 – 10 (Google toolbar shows it)

www.toolbar.google.com

Definition of Page Rank

"We assume page A has pages T1...Tn which point to it (i.e., are citations). The parameter d is a damping factor which can be set between 0 and 1. We usually set d to 0.85. Also C(A) is defined as the number of links going out of page A.

The PageRank of a page A is given as follows:

$$PR(A) = (1-d) + d\,(PR(T1)/C(T1) + \ldots + PR(Tn)/C(Tn))$$

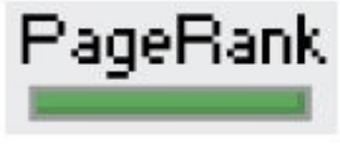
Note that the PageRanks form a probability distribution over web pages, so the sum of all web pages, PageRanks will be one"

CALCULATING PAGE RANK

DEFINITION OF TERMS

- PR: Shorthand for PageRank: the actual, real, page rank for each page as calculated by Google

- Toolbar PR: The PageRank displayed in the Google toolbar in your browser. This ranges from 0 to 10.

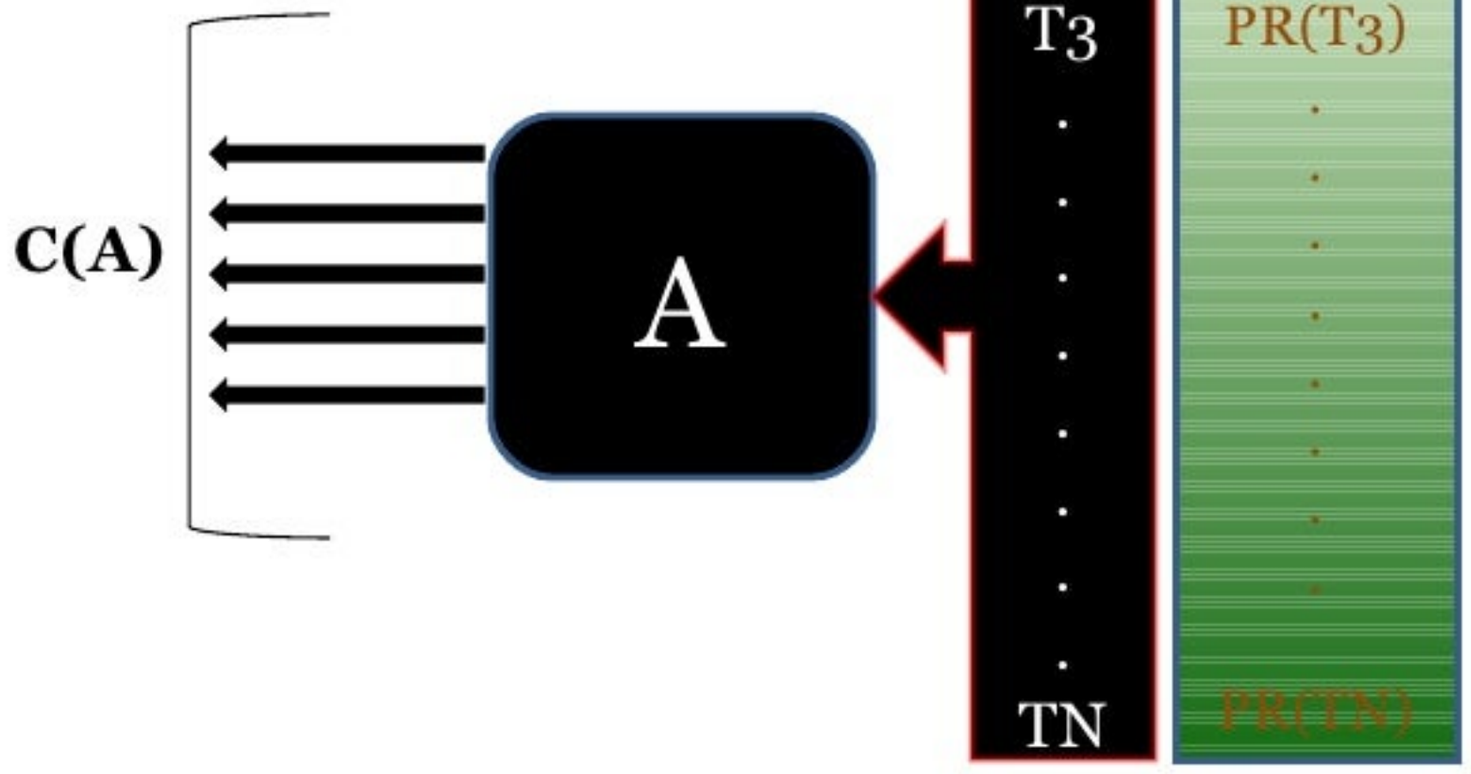


- Back link: If page A links out to page B, then page B is said to have a “back link” from page A.

Toolbar PageRank (log base 10)	Real PageRank
0	0 - 10
1	10 - 100
2	100 - 1,000
3	1,000 - 10,000
4	10,000 - 100,000
5	and so on…

- We, shall be calculating Real PR here.
- Toolbar PR is just an indication

CALCULATION OF PAGERANK



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- The PR of each page depends on the PR of the pages pointing to it.
- We won't know what PR those pages have until the pages pointing to them have their PR calculated
  - .....and so on
- Remember Chicken-Egg Story !!

Seems impossible to do this calculation!

Who came first ?

Chicken Or Egg ?

BUT

THERE IS A SOLUTION

- PageRank can be calculated using a simple *iterative* algorithm.
- It means,

  We can calculate a page's PR without knowing the final value of the PR of the other pages…

What we need to do :-

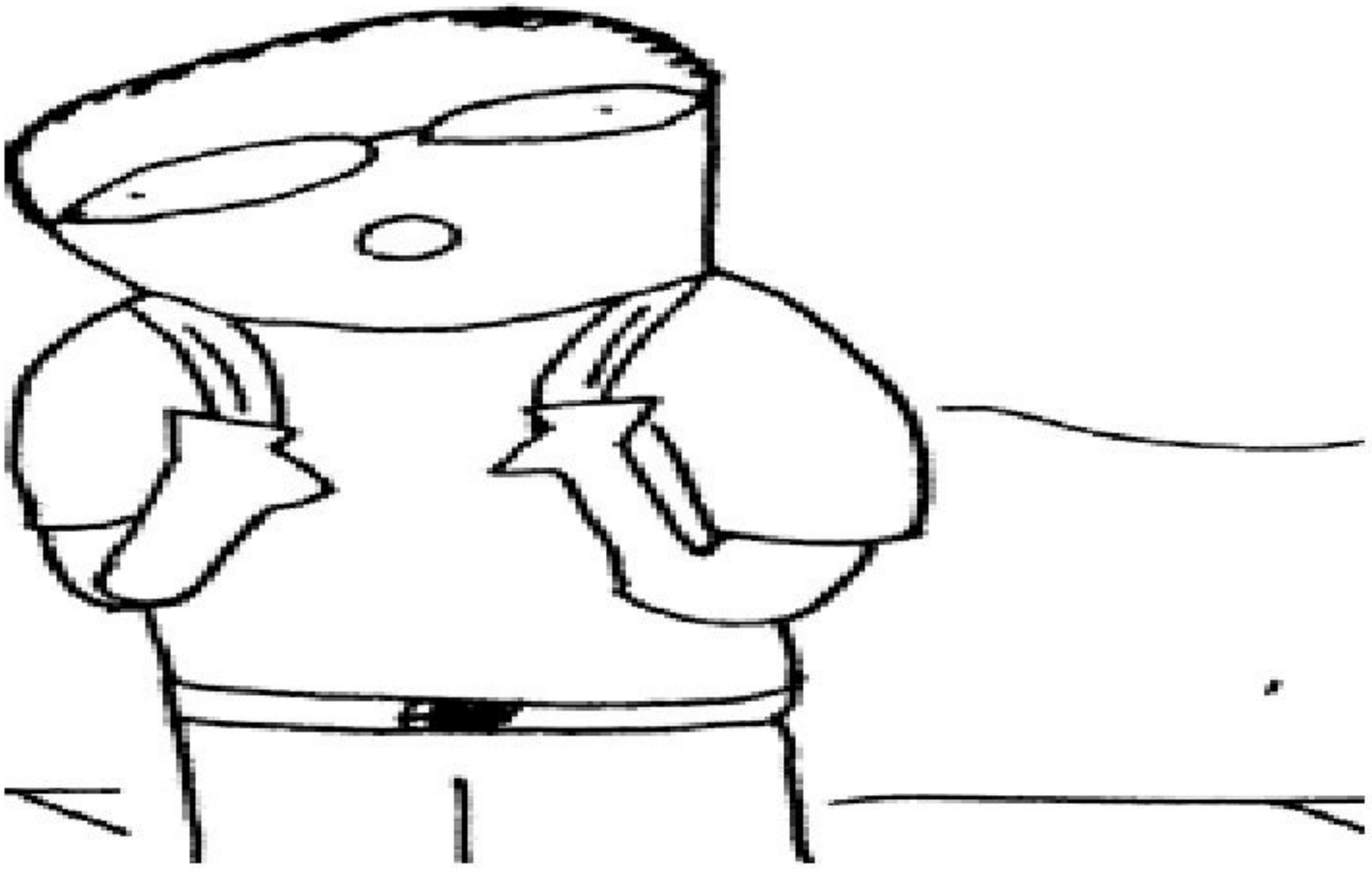
- Remember the each value we calculate
- Repeat the calculations lots of times

HOW MANY

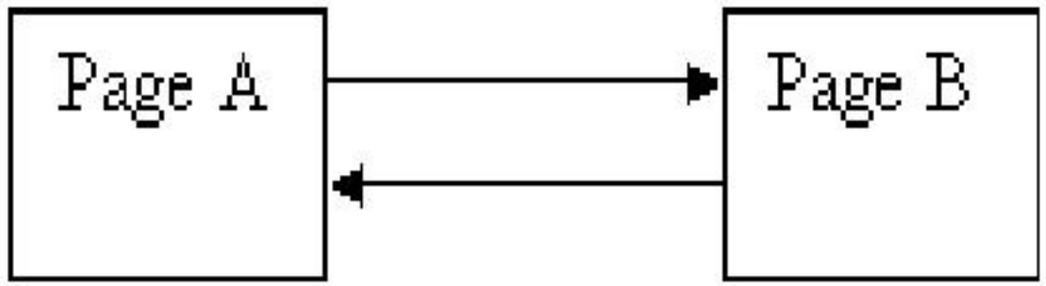
TIMES ?

Until
the numbers
stop *changing* much.

i don't know...
how?



Lets Learn
By
Examples !



C(A) = 1 and C(B) = 1

Let, us assume that PR =1.0 & d = 0.85 (by theory !!)

PR(A) = (1 – d) + d(PR(B)/1)

PR(B) = (1 – d) + d(PR(A)/1)

i.e.

PR(A) = 0.15 + 0.85 * 1 = 1

PR(B) = 0.15 + 0.85 * 1= 1

The numbers aren't changing at all ! We made a lucky guess !!

OK

BUT WHY SHOULD I ASSUME,

PR = 1 ?

WHAT IF NOT ?

So, Lets Start with PR=0

$PR(A) = 0.15 + 0.85 * 0 = 0.15$

$PR(B) = 0.15 + 0.85 * 0.15 = 0.2775$

Again,

$PR(A) = 0.15 + 0.85 * 0.2775 = 0.385875$

$PR(B) = 0.15 + 0.85 * 0.385875 = 0.47799375$

And again

$PR(A) = 0.15 + 0.85 * 0.47799375 = 0.5562946875$

$PR(B) = 0.15 + 0.85 * 0.5562946875 = 0.622850484375$

Inference : PR *approaches 1*

OK.. OK..

HOW CAN YOU SAY THAT

PR WON'T CROSS 1 ?

NO.. IT WONT

LET'S SEE HOW !

Let us assume : PR(A) = 40, PR(B) = 40

First calculation :

PR(A)= 0.15 + 0.85 * 40= 34.15

PR(B)= 0.15 + 0.85 * 34.15= 29.1775

And again :

PR(A)= 0.15 + 0.85 * 29.1775=24.950875

PR(B)= 0.15 + 0.85 * 24.950875= 21.35824375

…… PR will approach and settle down @ 1

CODE FOR PR

```
#!/usr/bin/perl
    print "Content-Type: text/html\n\n<pre>\n";
    $damp = 0.85;
    $a = 0; $b = 0;
    $i = 40; # loop 40 times
    # forward links
    # a -> b - 1 outgoing link
    # b -> a - 1 outgoing link

    # i.e. "backward" links (what's pointing to me?)
    # a <= b
    # b <= a

print "I've rounded to 5 decimal places to make the output easier to read\
n";

while ($i--) {
    printf("a: %.5f b: %.5f\n", $a, $b);
    $a = (1 - $damp) + $damp * ($b);
    $b = (1 - $damp) + $damp * ($a);
}
printf("Average pagerank = %.4f\n", ($a + $b) / 2);
```

a: 0.00000 b: 0.00000
a: 0.15000 b: 0.27750
a: 0.38588 b: 0.47799
a: 0.55629 b: 0.62285
a: 0.67942 b: 0.72751
a: 0.76838 b: 0.80313
a: 0.83266 b: 0.85776
a: 0.87909 b: 0.89723
a: 0.91265 b: 0.92575
a: 0.93689 b: 0.94635
a: 0.95440 b: 0.96124
a: 0.96705 b: 0.97200
a: 0.97620 b: 0.97977
a: 0.98280 b: 0.98538
a: 0.98757 b: 0.98944
a: 0.99102 b: 0.99237
a: 0.99351 b: 0.99449
a: 0.99531 b: 0.99602
a: 0.99661 b: 0.99712

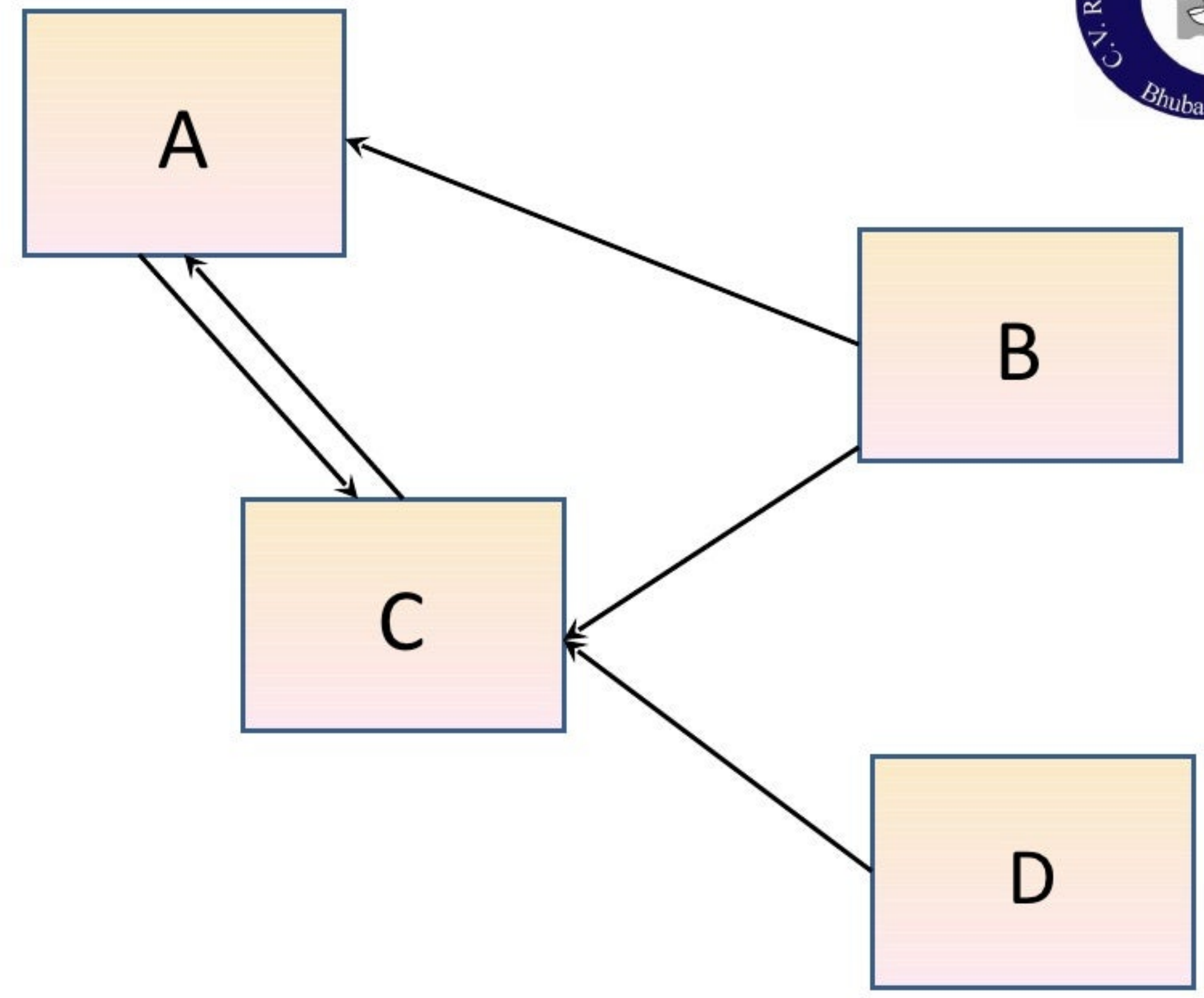
.....executing

a: 0.99823 b: 0.99850
a: 0.99872 b: 0.99891
a: 0.99908 b: 0.99922
a: 0.99933 b: 0.99943
a: 0.99952 b: 0.99959
a: 0.99965 b: 0.99970
a: 0.99975 b: 0.99979
a: 0.99982 b: 0.99985
a: 0.99987 b: 0.99989
a: 0.99991 b: 0.99992
a: 0.99993 b: 0.99994
a: 0.99995 b: 0.99996
a: 0.99996 b: 0.99997
a: 0.99997 b: 0.99998
a: 0.99998 b: 0.99998
a: 0.99999 b: 0.99999
a: 0.99999 b: 0.99999
a: 0.99999 b: 0.99999
a: 0.99999 b: 1.00000

Average pagerank = 1.00000

PRINCIPLE

- It doesn't matter where we start our guess !
- Once the PageRank calculations have settled down: the *"normalized probability distribution"* (the average PageRank for all pages) will be 1.0


A
B
C
D

CODE FOR GETTING PR


```
#!/usr/bin/perl
print "Content-Type: text/html\n\n<pre>\n";
$damp = 0.85;
$norm = 1 - $damp;
$a = 0;
$b = 0;
$c = 0;
$d = 0;
$i = 40; # loop 40 times
# forward links
# a -> b, c    - 2 outgoing links
# b -> c       - 1 outgoing link
# c -> a       - 1 outgoing link
# d -> a       - 1 outgoing link
# i.e. "backward" links (what's pointing to me?)
```


```
# a <= c
# b <= a
# c <= a, b, d
# d Đ nothing

while ($i--) {
    printf(
        "a: %5f b: %5f c: %5f d: %5f\n",
        $a, $b, $c, $d
    );
    $a = $norm + $damp * $c;
    $b = $norm + $damp * ($a/2);
    $c = $norm + $damp * ($a/2 + $b + $d);
    $d = $norm;
}
printf("Average pagerank = %4f\n", ($a + $b + $c + $d) /
  4);
```

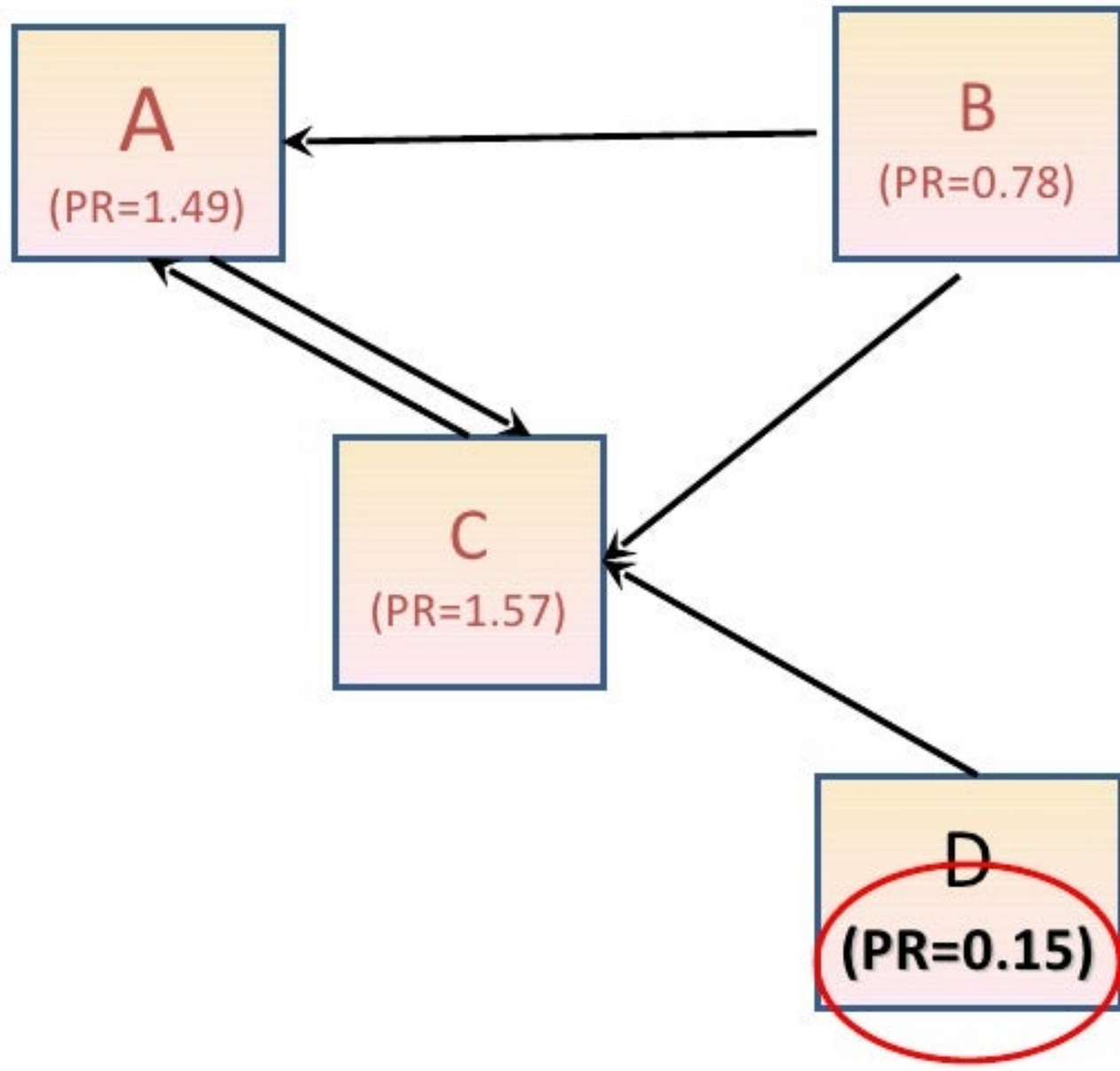
a: 0.00000 b: 0.00000 c: 0.00000 d: 0.00000
a: 0.15000 b: 0.21375 c: 0.39544 d: 0.15000
a: 0.48612 b: 0.35660 c: 0.78721 d: 0.15000
a: 0.81913 b: 0.49813 c: 1.04904 d: 0.15000
a: 1.04169 b: 0.59272 c: 1.22403 d: 0.15000
a: 1.19042 b: 0.65593 c: 1.34097 d: 0.15000
a: 1.28982 b: 0.69818 c: 1.41912 d: 0.15000
a: 1.35626 b: 0.72641 c: 1.47136 d: 0.15000
a: 1.40065 b: 0.74528 c: 1.50626 d: 0.15000
a: 1.43032 b: 0.75789 c: 1.52959 d: 0.15000
a: 1.45015 b: 0.76632 c: 1.54518 d: 0.15000
a: 1.46341 b: 0.77195 c: 1.55560 d: 0.15000
a: 1.47226 b: 0.77571 c: 1.56257 d: 0.15000
a: 1.47818 b: 0.77823 c: 1.56722 d: 0.15000
a: 1.48214 b: 0.77991 c: 1.57033 d: 0.15000
a: 1.48478 b: 0.78103 c: 1.57241 d: 0.15000
a: 1.48655 b: 0.78178 c: 1.57380 d: 0.15000
a: 1.48773 b: 0.78228 c: 1.57473 d: 0.15000
a: 1.48852 b: 0.78262 c: 1.57535 d: 0.15000
a: 1.48904 b: 0.78284 c: 1.57576 d: 0.15000

a: 1.48940 b: 0.78299 c: 1.57604 d: 0.15000
a: 1.48963 b: 0.78309 c: 1.57622 d: 0.15000
a: 1.48979 b: 0.78316 c: 1.57635 d: 0.15000
a: 1.48990 b: 0.78321 c: 1.57643 d: 0.15000
a: 1.48997 b: 0.78324 c: 1.57649 d: 0.15000
a: 1.49001 b: 0.78326 c: 1.57652 d: 0.15000
a: 1.49004 b: 0.78327 c: 1.57655 d: 0.15000
a: 1.49007 b: 0.78328 c: 1.57656 d: 0.15000
a: 1.49008 b: 0.78328 c: 1.57657 d: 0.15000
a: 1.49009 b: 0.78329 c: 1.57658 d: 0.15000
a: 1.49009 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49010 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49010 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49010 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49010 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49011 b: 0.78329 c: 1.57660 d: 0.15000
a: 1.49011 b: 0.78330 c: 1.57660 d: 0.15000
a: 1.49011 b: 0.78330 c: 1.57660 d: 0.15000
a: 1.49011 b: 0.78330 c: 1.57660 d: 0.15000
a: 1.49011 b: 0.78330 c: 1.57660 d: 0.15000

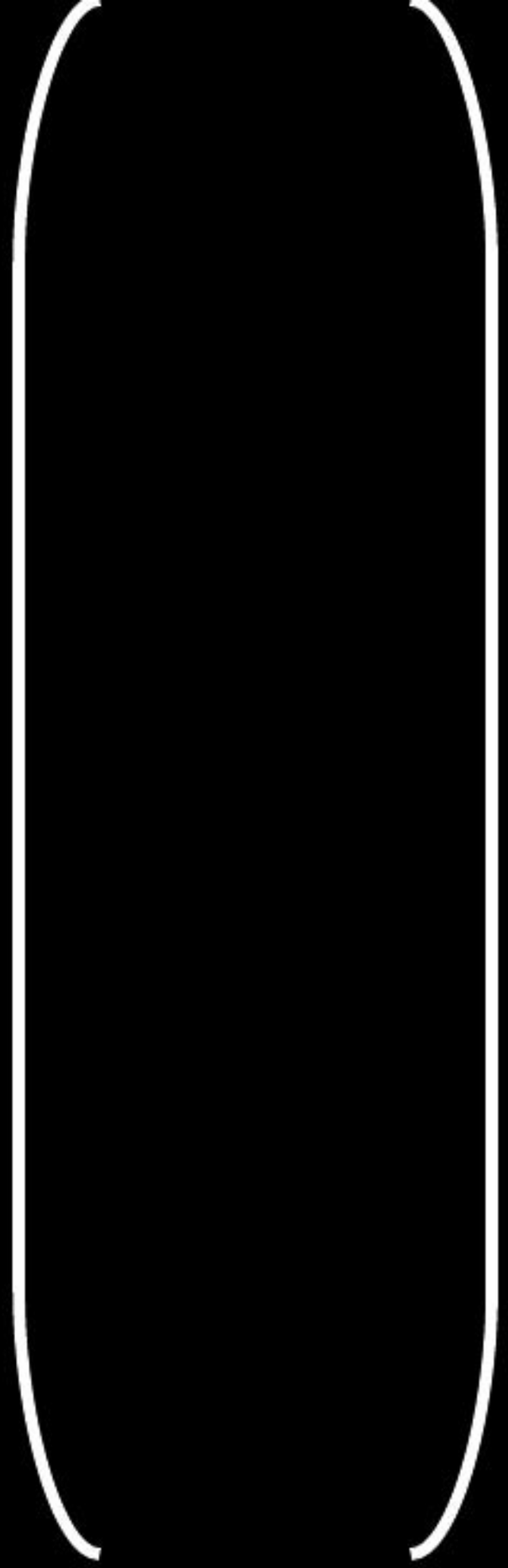
Average pagerank = 1.00000

…… just graphically representing it !

Its okay if A, B, C have Page Ranks, But how come D has ?
It has got no in bound links !!



a: 1.48940 b: 0.78299 c: 1.57604 d: 0.15000
a: 1.48963 b: 0.78309 c: 1.57622 d: 0.15000
a: 1.48979 b: 0.78316 c: 1.57635 d: 0.15000
a: 1.48990 b: 0.78321 c: 1.57643 d: 0.15000
a: 1.48997 b: 0.78324 c: 1.57649 d: 0.15000
a: 1.49001 b: 0.78326 c: 1.57652 d: 0.15000
a: 1.49004 b: 0.78327 c: 1.57655 d: 0.15000
a: 1.49007 b: 0.78328 c: 1.57656 d: 0.15000
a: 1.49008 b: 0.78328 c: 1.57657 d: 0.15000
a: 1.49009 b: 0.78329 c: 1.57658 d: 0.15000
a: 1.49009 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49010 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49010 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49010 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49010 b: 0.78329 c: 1.57659 d: 0.15000
a: 1.49011 b: 0.78329 c: 1.57660 d: 0.15000
a: 1.49011 b: 0.78330 c: 1.57660 d: 0.15000
a: 1.49011 b: 0.78330 c: 1.57660 d: 0.15000
a: 1.49011 b: 0.78330 c: 1.57660 d: 0.15000
a: 1.49011 b: 0.78330 c: 1.57660 d: 0.15000



Let's revisit the basic equation :

- $PR(A) = \mathbf{(1-d)} +$

$$d\,(PR(T1)/C(T1) + \ldots + PR(Tn)/C(Tn))$$

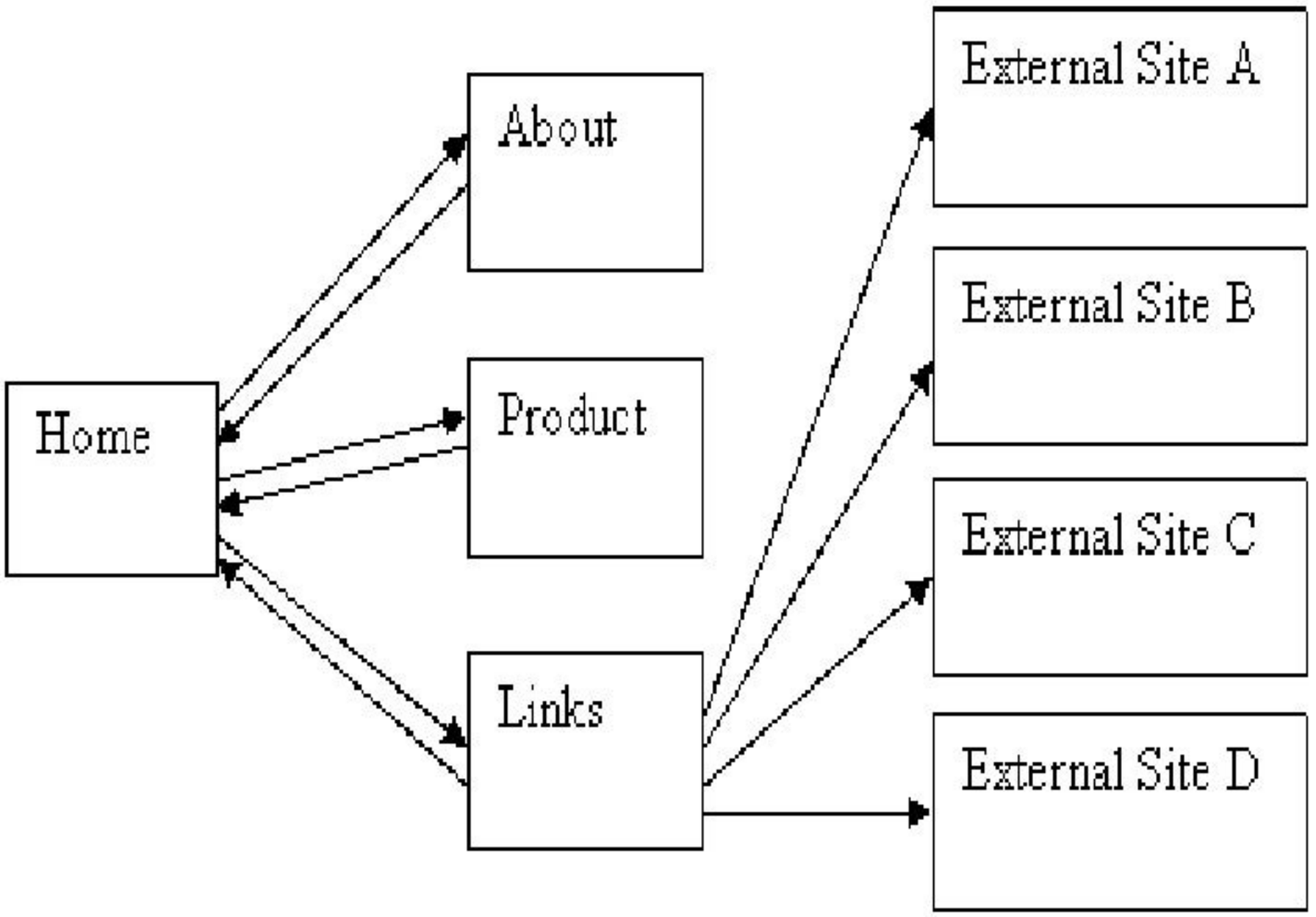
- So, for Page D, no back links means the equation looks like this:

$$PR(A) = (1-d) + d * (0) = 0.15$$

- *Every page has at least a PR of 0.15 to share out.*

A

Sample Case....


About
Home
Product
Links
External Site A
External Site B
External Site C
External Site D


```
#!/usr/bin/perl
print "Content-Type: text/html\n\n<pre>\n";
$damp = 0.85;
$a = $b = $c = $d = $e = $f = $g = $h = 0;
$i = 40; # loop 40 times
# forward links
# a -> b, c, d    - 3 outgoing links    - home
# b -> a    - 1 outgoing link    - about
# c -> a    - 1 outgoing link    - products
# d -> a, e, f, g, h    - 5 outgoing links    - links
# e,f,g,h    - nothing    - external sites
# i.e. "backward" links (what's pointing to me?)
# a <= b, c, d
# b,c,d <= a
# e,f,g,h <= d
while($i--){
    printf
    ("a: %5f b: %5f c: %5f d: %5f e: %5f f: %5f g: %5f h: %5f\n",
    $a, $b, $c, $d, $e, $f, $g, $h
    );
    $a=1-$damp+$damp*($b+$c+$d/5);
    $b=1-$damp+$damp*($a/3);
    $c=1-$damp+$damp*($a/3);
    $d=1-$damp+$damp*($a/3);
    $e=$f=$g=$h=1-$damp+$damp*($d/5);
    }
    printf
("Average pagerank= %4f\n", ($a+$b+$c+$d+$e+$f+$g+$h)/8);
```

a: 0.00000 b: 0.00000 c: 0.00000 d: 0.00000 e: 0.00000 f: 0.00000 g: 0.00000 h: 0.00000
a: 0.15000 b: 0.19250 c: 0.19250 d: 0.19250 e: 0.18273 f: 0.18273 g: 0.18273 h: 0.18273
a: 0.50998 b: 0.29449 c: 0.29449 d: 0.29449 e: 0.20006 f: 0.20006 g: 0.20006 h: 0.20006
a: 0.70070 b: 0.34853 c: 0.34853 d: 0.34853 e: 0.20925 f: 0.20925 g: 0.20925 h: 0.20925
a: 0.80176 b: 0.37716 c: 0.37716 d: 0.37716 e: 0.21412 f: 0.21412 g: 0.21412 h: 0.21412
a: 0.85530 b: 0.39233 c: 0.39233 d: 0.39233 e: 0.21670 f: 0.21670 g: 0.21670 h: 0.21670
a: 0.88366 b: 0.40037 c: 0.40037 d: 0.40037 e: 0.21806 f: 0.21806 g: 0.21806 h: 0.21806
a: 0.89869 b: 0.40463 c: 0.40463 d: 0.40463 e: 0.21879 f: 0.21879 g: 0.21879 h: 0.21879
a: 0.90666 b: 0.40689 c: 0.40689 d: 0.40689 e: 0.21917 f: 0.21917 g: 0.21917 h: 0.21917
a: 0.91088 b: 0.40808 c: 0.40808 d: 0.40808 e: 0.21937 f: 0.21937 g: 0.21937 h: 0.21937
a: 0.91311 b: 0.40872 c: 0.40872 d: 0.40872 e: 0.21948 f: 0.21948 g: 0.21948 h: 0.21948
a: 0.91430 b: 0.40905 c: 0.40905 d: 0.40905 e: 0.21954 f: 0.21954 g: 0.21954 h: 0.21954
a: 0.91493 b: 0.40923 c: 0.40923 d: 0.40923 e: 0.21957 f: 0.21957 g: 0.21957 h: 0.21957
a: 0.91526 b: 0.40932 c: 0.40932 d: 0.40932 e: 0.21958 f: 0.21958 g: 0.21958 h: 0.21958
a: 0.91543 b: 0.40937 c: 0.40937 d: 0.40937 e: 0.21959 f: 0.21959 g: 0.21959 h: 0.21959
a: 0.91553 b: 0.40940 c: 0.40940 d: 0.40940 e: 0.21960 f: 0.21960 g: 0.21960 h: 0.21960
a: 0.91558 b: 0.40941 c: 0.40941 d: 0.40941 e: 0.21960 f: 0.21960 g: 0.21960 h: 0.21960
a: 0.91560 b: 0.40942 c: 0.40942 d: 0.40942 e: 0.21960 f: 0.21960 g: 0.21960 h: 0.21960
a: 0.91562 b: 0.40942 c: 0.40942 d: 0.40942 e: 0.21960 f: 0.21960 g: 0.21960 h: 0.21960
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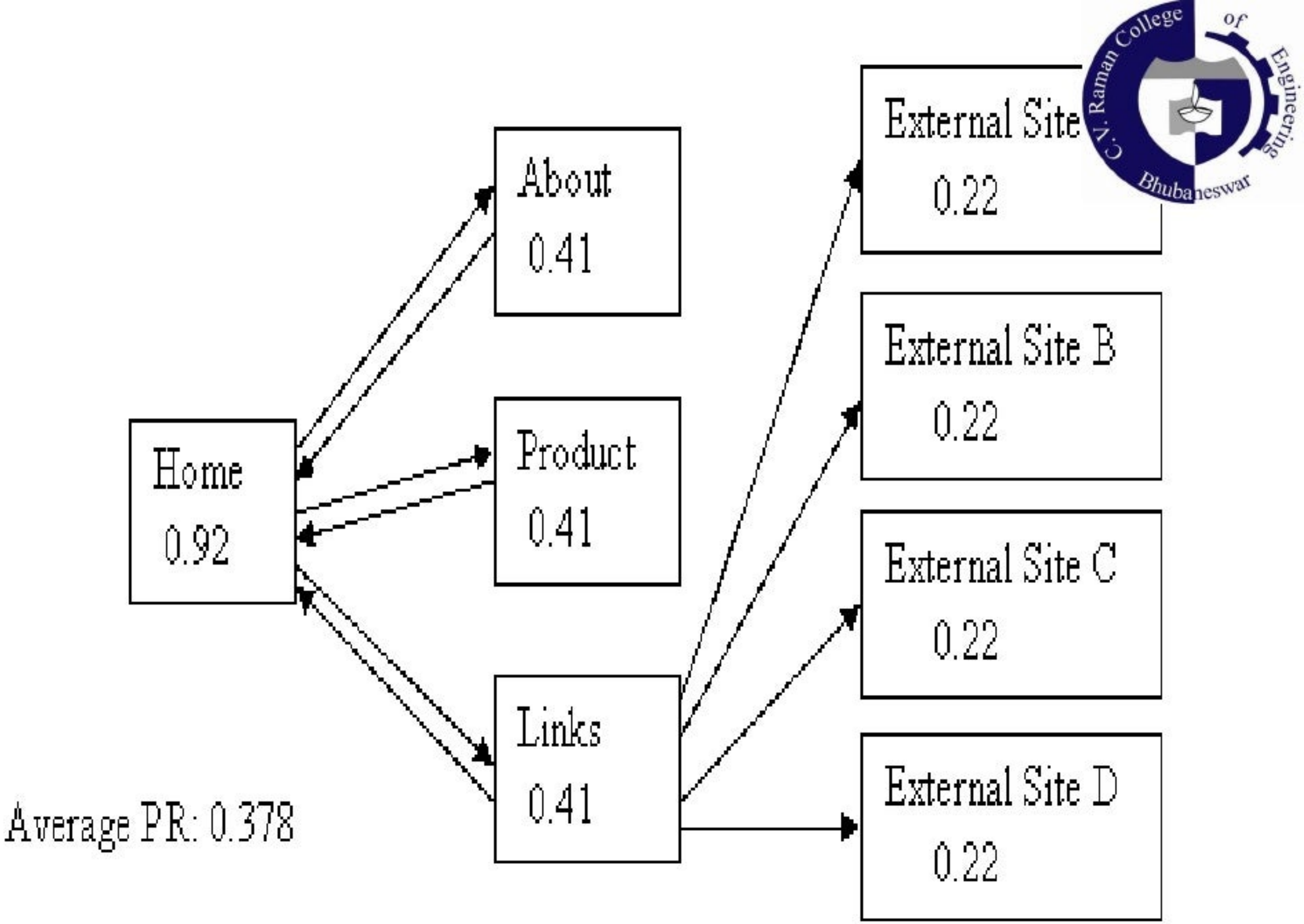
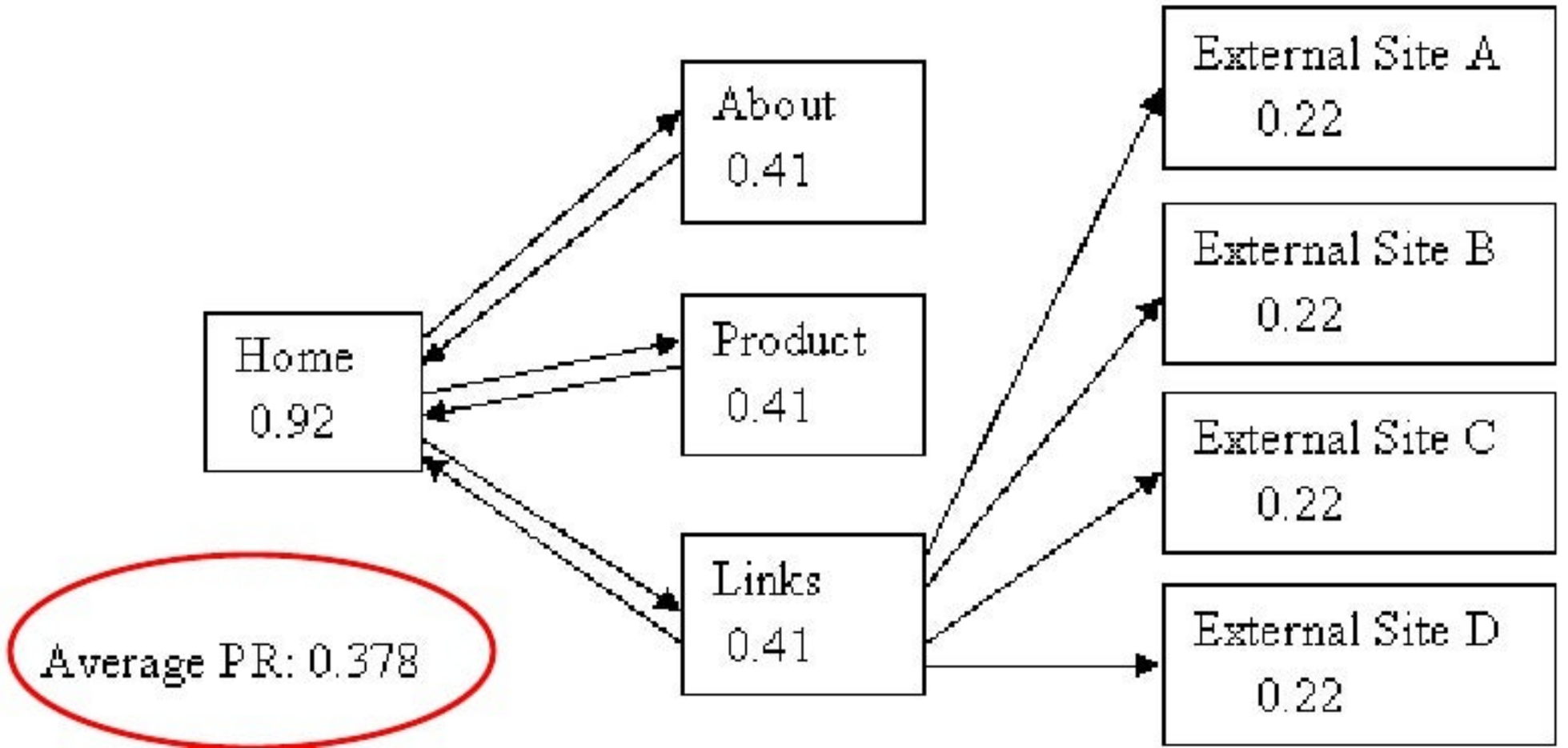
a: 0.91563 b: 0.40943 c: 0.40943 d: 0.40943 e: 0.21960 f: 0.21960 g: 0.21960 h: 0.21960

Average pagerank = 0.3778


Home
0.92
About
0.41
Product
0.41
Links
0.41
External Site
0.22
External Site B
0.22
External Site C
0.22
External Site D
0.22
Average PR: 0.378

- The home page has the highest PR –
  …….after all, it has the most incoming

- But what's happened to the average?
  It's only 0.378!!!



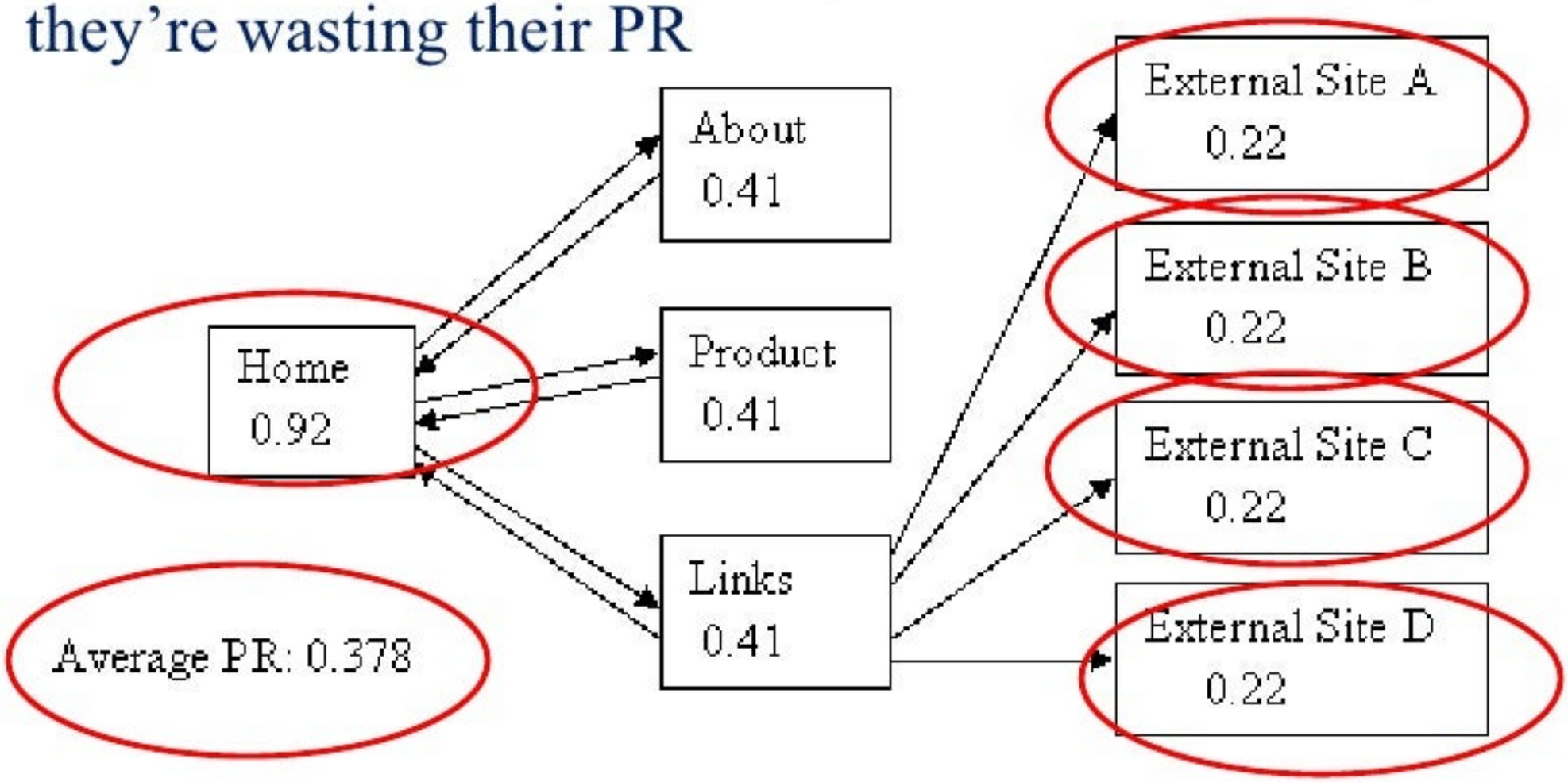
Well,

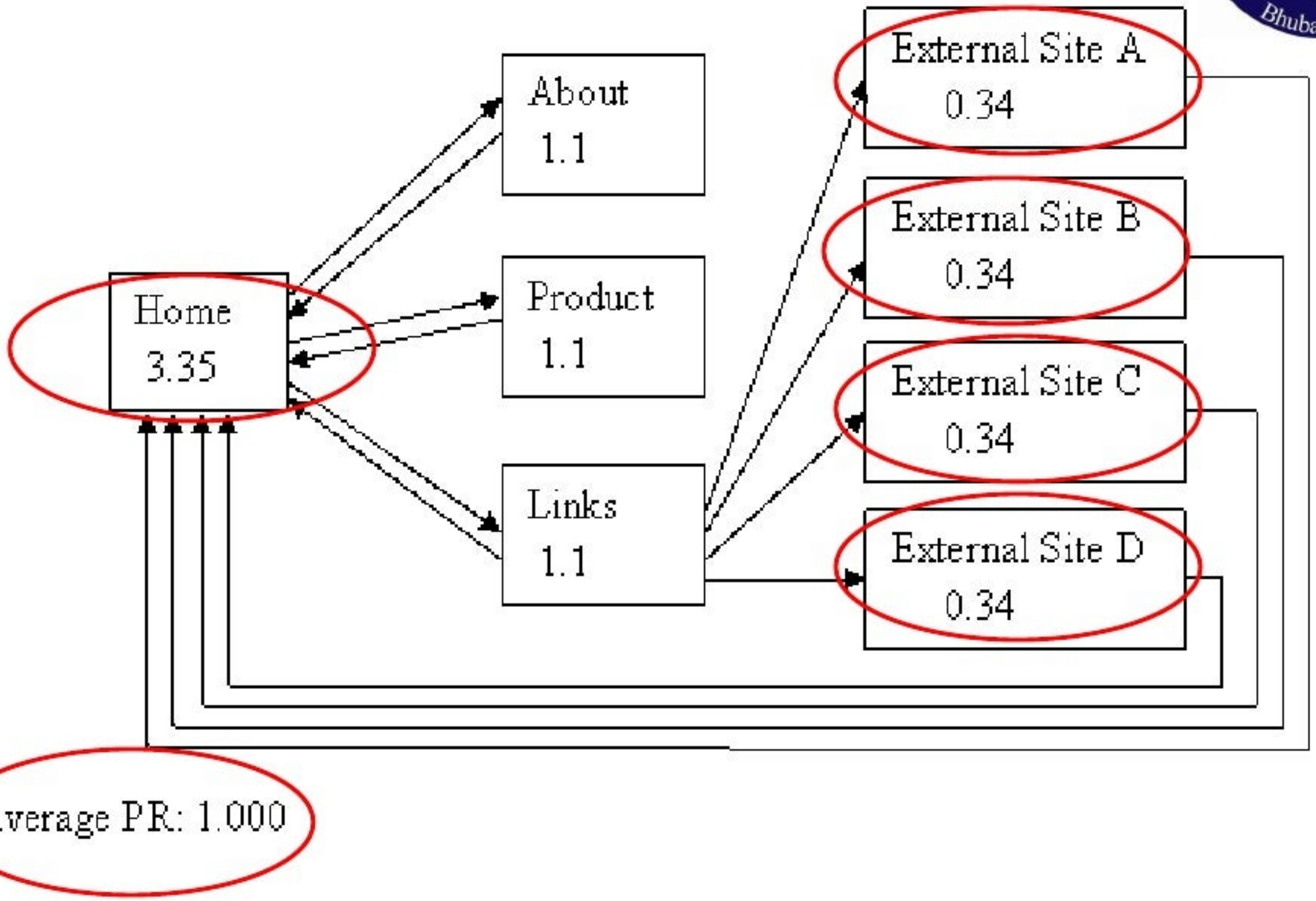
Everything is just

fine !!

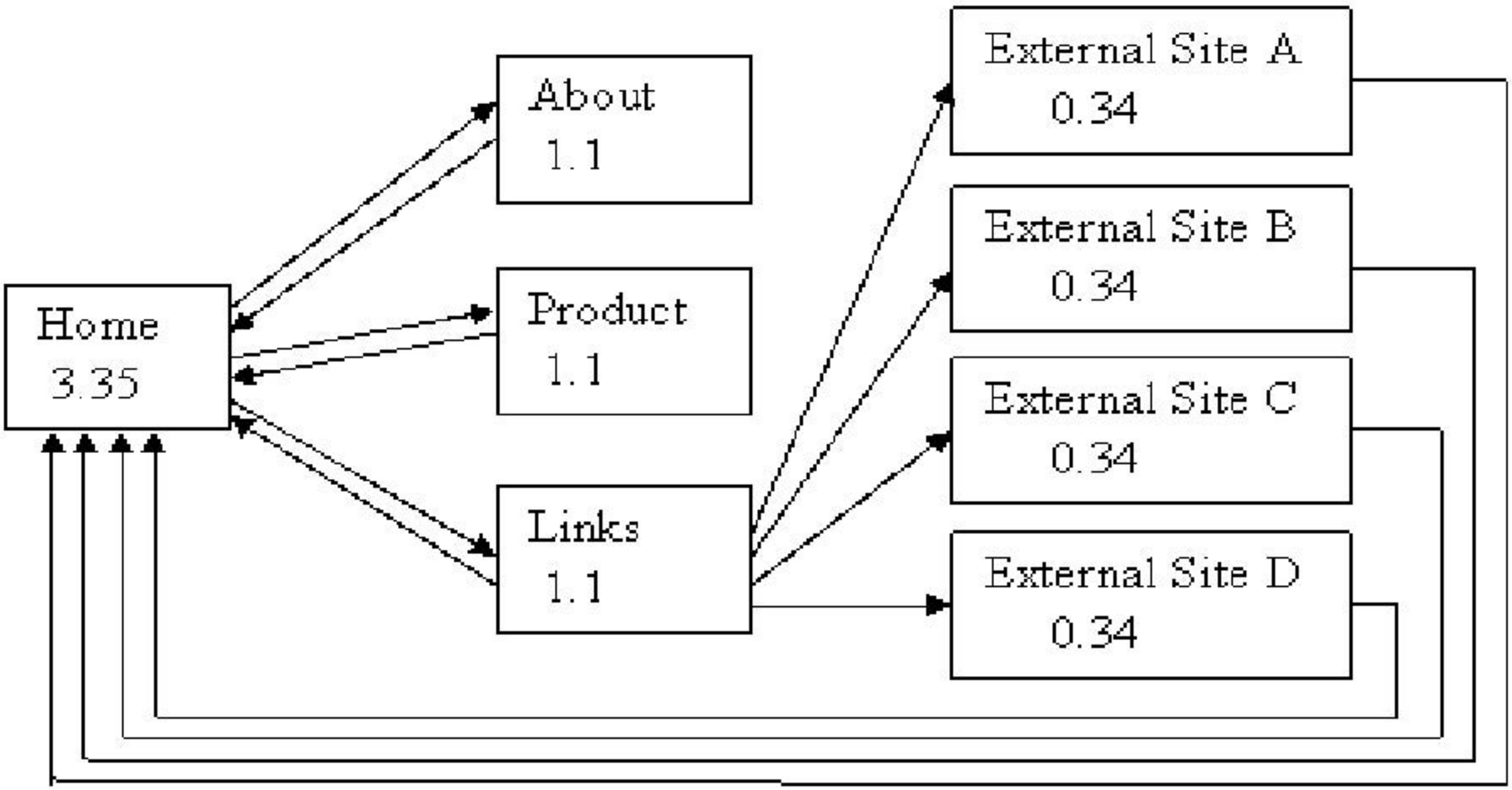
Lets, take a look at the "external site" pages - What's happening to their PageRank?

- They're not passing it on, they're not voting for anyone, they're wasting their PR



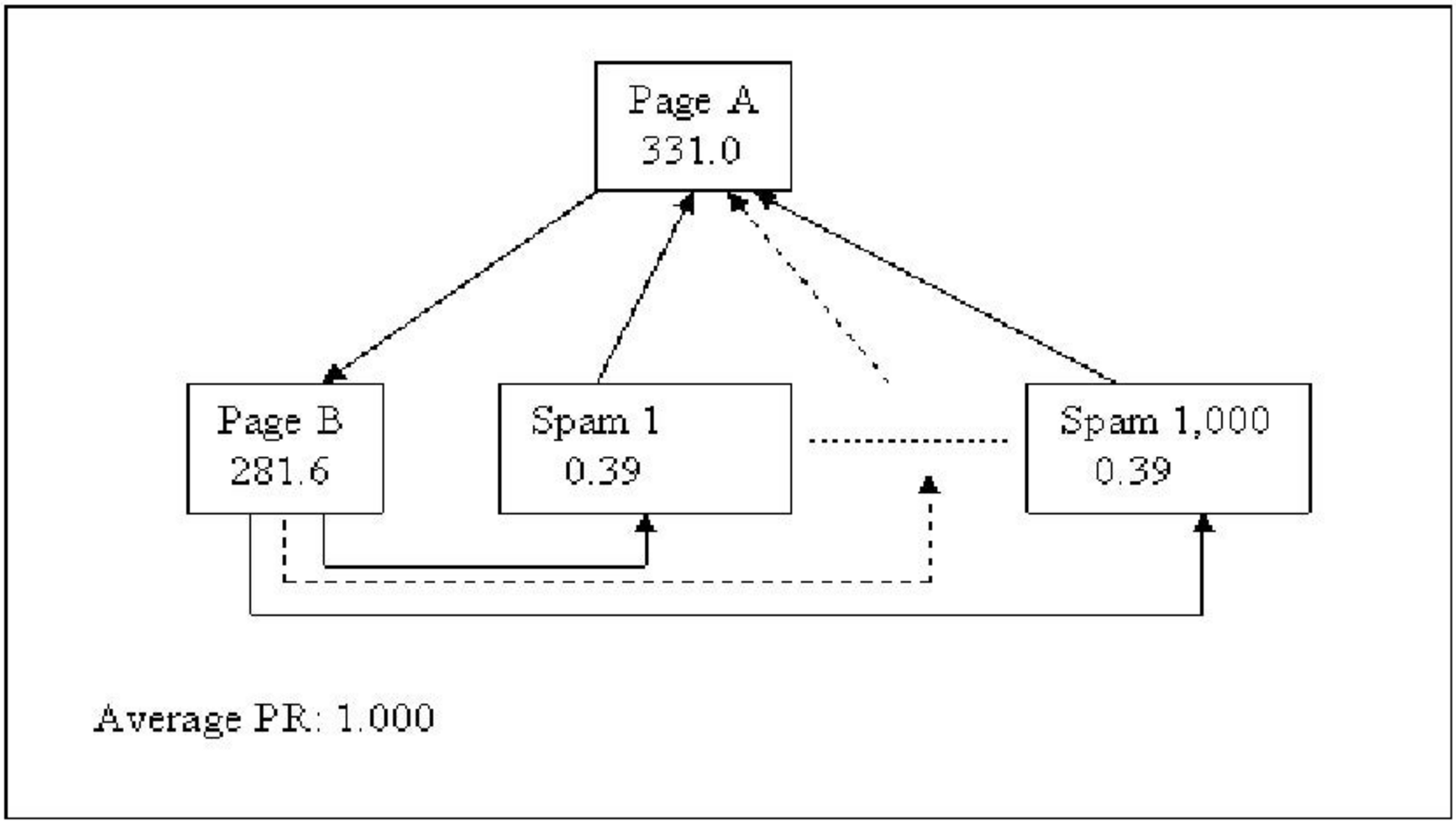

Home
3.35
About
1.1
Product
1.1
Links
1.1
External Site A
0.34
External Site B
0.34
External Site C
0.34
External Site D
0.34
Average PR: 1.000

- That's better - It does work after all!
- And look at the PR of our home page!
- All those incoming links sure make a difference



Average PR: 1.000

Just as an experiment, let's see if we can get 1,000 pages pointing to our home page, but only have one link leaving it…



Yes, those spam pages are pretty worthless but they sure add up!

OBSERVATION

- Regardless, the number of pages, average PR will always be 1.0 at best.
- But a hierarchical layout can strongly concentrate votes, and therefore pump the PR into the home page!

- It is a technique used by some disreputable sites (mostly adult content sites).

- But its not advisable anyway !!

- If Google's robots decide you're doing this..


YOU'RE BANNED
lolz.c

Peep In

MY THOUGHTS, MY STAND POINTS AND MY CONFESSIONS

Sep 24, 2008

Why do you read this ?

It was last night, a very good friend of mine asked me : What makes you blog?
I did'nt riposte anything (usually I don't entertain interrogation at wee hours of night, unless the inquisitor were a cop and left me with no other choice, but to speak).

While I was moderating my recent comments formerly, the question striked back to me calling for a comprehensive justification of this blogging habit. I had the reason with me, but I never knew it until I was asked this question.

My habit of blogging is a trivial outcome of some my clandestine contemplations, that were occult since the days I realised my existance. I have been a person who speaks in 'n' different ways to 'n' number of people. Most of the people around me have a illusion that I am open. Yes, I am. Still its an illusion. And while I am saying this, I must make it clear that they have seen what I have shown them, and not what is there to see in me. I say what people are happy to hear. I am not so fanatic about

My Bio

Omkar Dash
I have self-indulgent way of looking at life and reality. Its difficult to delve the unfeigned "me". Possibly my blogs can elucidate the part of me that may be of some interest to you.
View my complete profile

I Power Blogger

Archives..

▼ 2008 (43)
▼ Sep 2008 (9)
Why do you read this ?
Its F' ing weird..
My Compulsive Confession !
My Lunatic Grumbles

Google

http://www.google.co.in/

Web Images News Orkut Groups Gmail more ▼ iGoogle | Sign in

Omkar Dash

Google Search I'm Feeling Lucky

Advanced Search
Preferences
Language Tools

Search: the web pages from India

Project 10^100: Tell Google how you want to change the world.

Google.co.in offered in: Hindi Bengali Telugu Marathi Tamil Gujarati Kannada Malayalam Punjabi

Advertising Programs - About Google - Go to Google.com

©2008 - Privacy

start Windows Media Player Page Rank (Allegreto... Microsoft PowerPoint ... Google - Google Chrome 2:41 PM

Google

Omkar Dash Search Advanced Search Preferences

Search: the web pages from India

Web Results **1** - **10** of about **6,490** for **Omkar Dash**. (**0.10** seconds)

Omkar Dash - LinkedIn
View **Omkar Dash's** professional profile on LinkedIn. LinkedIn is the world's largest business network, helping professionals like **Omkar Dash** discover inside **...**
www.linkedin.com/pub/a/61/480 - 12k - Cached - Similar pages

Omkar Dash | Facebook
This is **Omkar Dash's** public search listing on Facebook. **Omkar's** friends can view photos, videos and more. Everyone can join Facebook.
www.facebook.com/people/**Omkar_Dash**/702936937 - 18k - Cached - Similar pages

Yahoo! Answers - **Omkar Dash's** Q&A profile
Yahoo! Answers is a new way to find and share information. You can ask questions on any topic, get answers from real people, and share your insights and **...**
answers.yahoo.com/my/profile?show=HCXVoUccaa - 26k - Cached - Similar pages

omkar dash
www.orkut.co.in/Profile.aspx?uid=10007620360963202737 - Similar pages

TCS INTERVIEW - 15 MAR 2008 - BHUBANESWAR
I am **Omkar Dash** from CVRCE (I.T), Bhubaneswar. I was one of the lucky 130 students who got through campus recruitment procedure of TCS with success. **...**
www.chetanasinterview.com/articles/3637/1/TCS-INTERVIEW---15-MAR-2008---BHUBANESWAR/Page1.html - 64k - Cached - Similar pages

Omkar - MyBlogLog
Omkar. **Omkar** FOAF **Omkar** hCard **Omkar** vCard · **Omkar Omkar Dash**. 21, Male Bhubaneswar. Yahoo Yahoo **dash.omkar**. Member Since: Aug '08 Last Login: Online Now **...**
www.mybloglog.com/buzz/members/mybloglog39f5c3893b4933b0bca2/ - 48k - Cached - Similar pages

Names Directory: **Omkar**
Common surnames for **Omkar**: **Omkar** Adkar **Omkar** Agrahari **Omkar** Ambardekar **Omkar** Ambulkar **Omkar** Anand **Omkar Dash Omkar** Babu **Omkar** Bhadsavle **Omkar** Bhagwat

Names Directory: **Omkar**

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www.namesdir.com/F_**Omkar** - 6k - Cached - Similar pages

dash.omkar - eSnips Profile - 2 visits - 28 Apr

dash.omkar. Lives in:. Joined eSnips on Nov. 3 2007. Personal details:. Full name: **dash.omkar**; Age: 30; Total folder visitors: 16; Most popular folder: ...
www.esnips.com/user/**dashomkar** - 20k - Cached - Similar pages

::Student transfer :: Student transfer from 1.4.2008 on wards Sl ...

1545, **OMKAR DASH**, SHISHIR KUMAR **DASH**, 5654, I, 22652, 15.04.2008. 1546, KUMARI SUHASREE CHANDA, SUBIR CHANDA, 4980, IV, 22653, 22.04.2008 ...
www.kvnazira.com/uploads/april.htm - 17k - Cached - Similar pages

Peep In - 10 visits - 22 Sep

Omkar Dash: I have self-indulgent way of looking at life and reality. Its difficult to delve the unfeigned "me". Possibly my blogs can elucidate the part of ...
omkardash.blogspot.com/ - 63k - Cached - Similar pages

Gooooooooooogle ▶

1 2 3 4 5 6 7 8 9 10 Next

Omkar Dash Search

Search within results | Language Tools | Search Tips | Dissatisfied? Help us improve

Google Home - Advertising Programs - Privacy - About Google

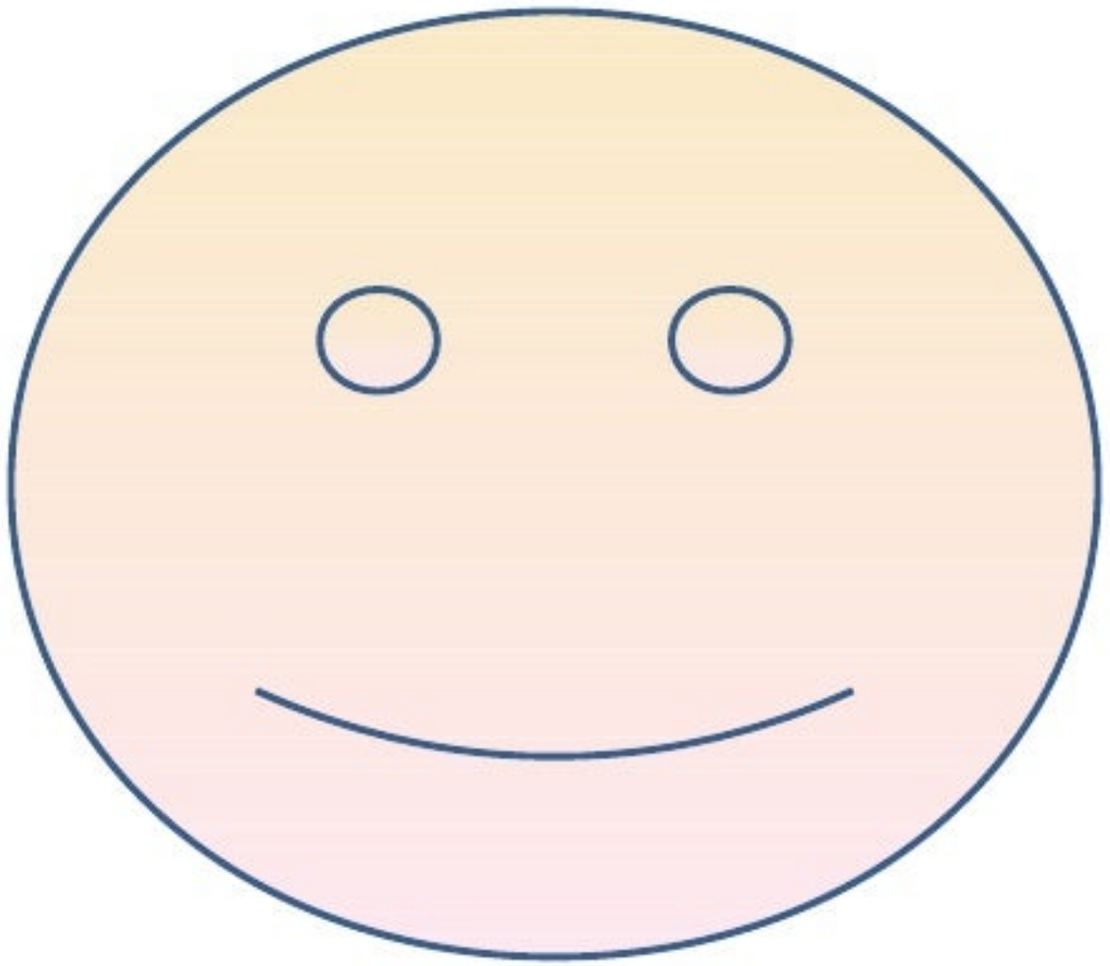
start | Omkar Dash - Google ... | Microsoft PowerPoint ... | 10:25

A BETTER SERP

- *Meta tags* should be properly used
- Contents should be unique and high quality
- Back links to your pages but that should be relevant

REFERENCES

- Sergey Brin and Lawrence Page, "Anatomy of a Large-Scale Hyper textual Web Search Engine"
- http://www.ianrogers.net/google-page-rank
- PageRank: http://en.wikipedia.org/
- www.google.stanford.edu



Thank You
Queries Please !