The relevance determined using the random walker model corresponds to

1. The number of steps a random walker needs to reach a page
2. The probability that the random walker visits the page in the long term
3. The number of incoming links a random walker can use to visit the page
4. The probability that the random walker will visit once the page

Answer 2

The relevance measure derived from the random walker model corresponds to the stationary (long-term) probability of the random walker to visit a page. The number of incoming links does have an influence on this probability but is not determining it.

Consider a random jump matrix with entries 1/3 in the first column and 0 otherwise. It means

1. A random walker can always leave node 1 even without outgoing edges
2. A random walker can always reach node 1, even without incoming edges
3. A random walker can always leave node 2, even without outgoing edges
4. none of the above

Answer 1

The first column of the matrix corresponds to the probabilities to jump to from node 1 to every other node. Therefore, the random walker when arriving at node 1 can always leave that node by making random jump. On the other hand, node 1 can only be reached when an incoming edge exists. If node 2 has no outgoing edge, the random walker cannot leave it.

When computing HITS, the initial values

1. Are set all to 1
2. Are set all to $\frac{1}{n}$
3. Are set all to $\frac{1}{\sqrt{n}}$
4. Are chosen randomly

Answer 3

In the standard formulation of the algorithm the normalization factor is $\frac{1}{\sqrt{n}}$ so that the L2 norm of the vector equals 1.

If the first column of matrix L is (0,1,1,1) and all other entries are 0 then the authority values

1. $(0,1,1,1)$
2. $\left(0, 1/\sqrt{3}, 1/\sqrt{3}, 1/\sqrt{3}\right)$
3. $\left(1, 1/\sqrt{3}, 1/\sqrt{3}, 1/\sqrt{3}\right)$
4. $(1,0,0,0)$

Answer 2

If the first column of matrix L is (0,1,1,1), then node 1 has one link to each other graph. Correspondingly it will be a hub, and the only hub and have hub weight 1. The other nodes will receive the same authority from that node. Thus, their weights will be equally distributed and be therefore $1/\sqrt{3}$ so that the L2 norm of the authority vector equals 1. Note that as consequence node 1 will receive equal weights from the three authority nodes.