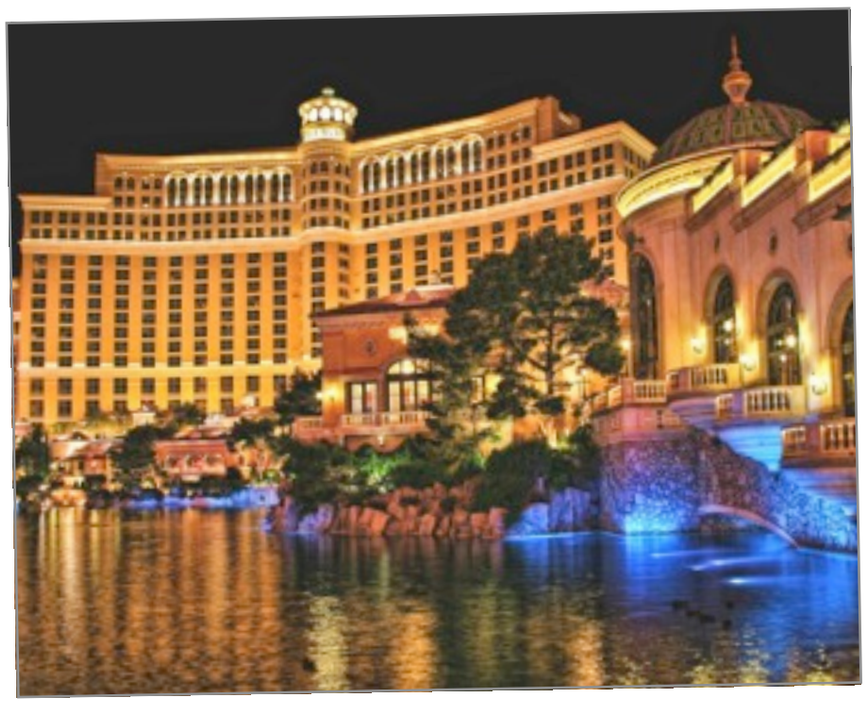
An efficient algorithm to generate Search Shortcuts

“las vegas”

"caesars palace"

"gambling places"

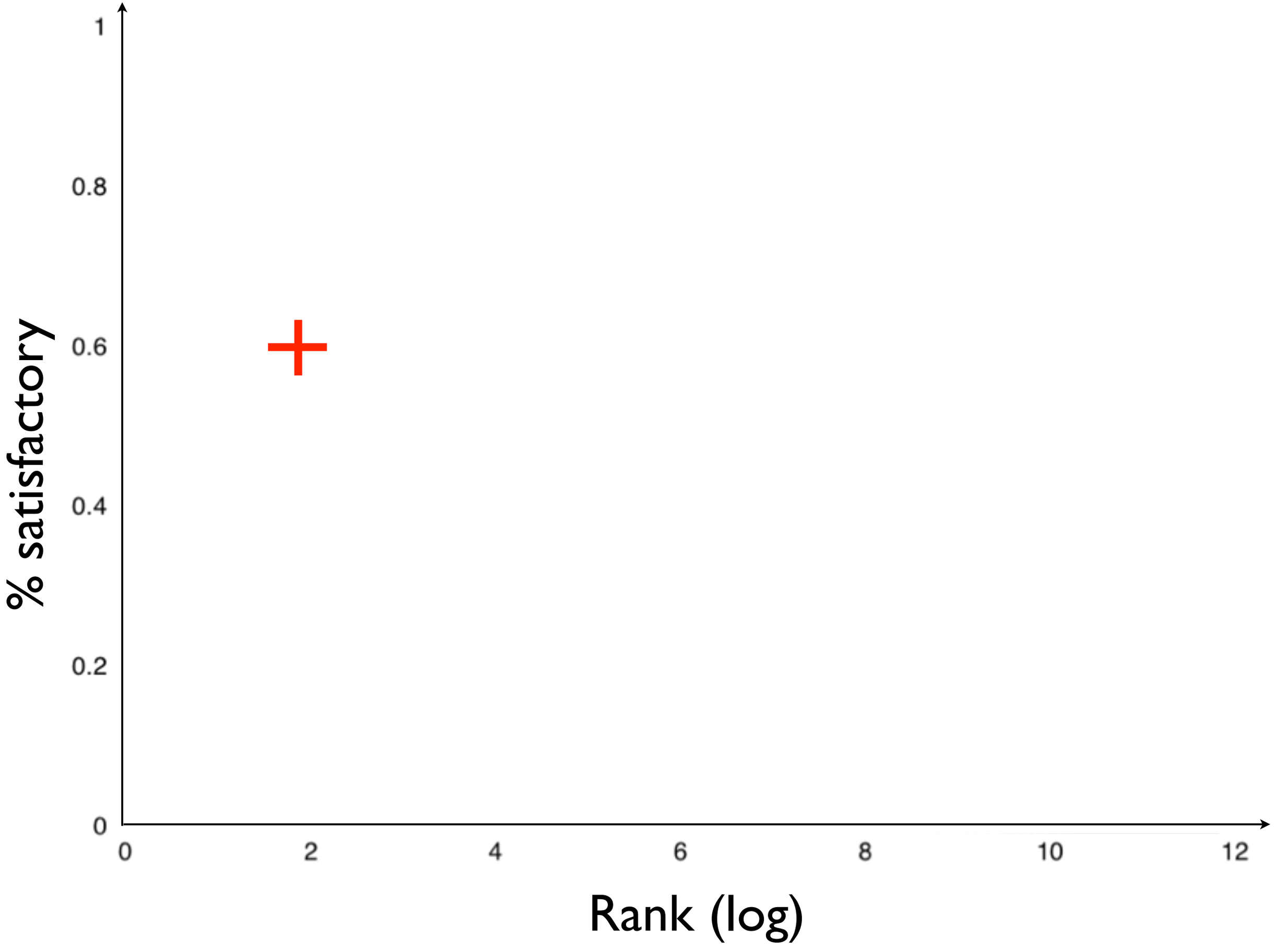


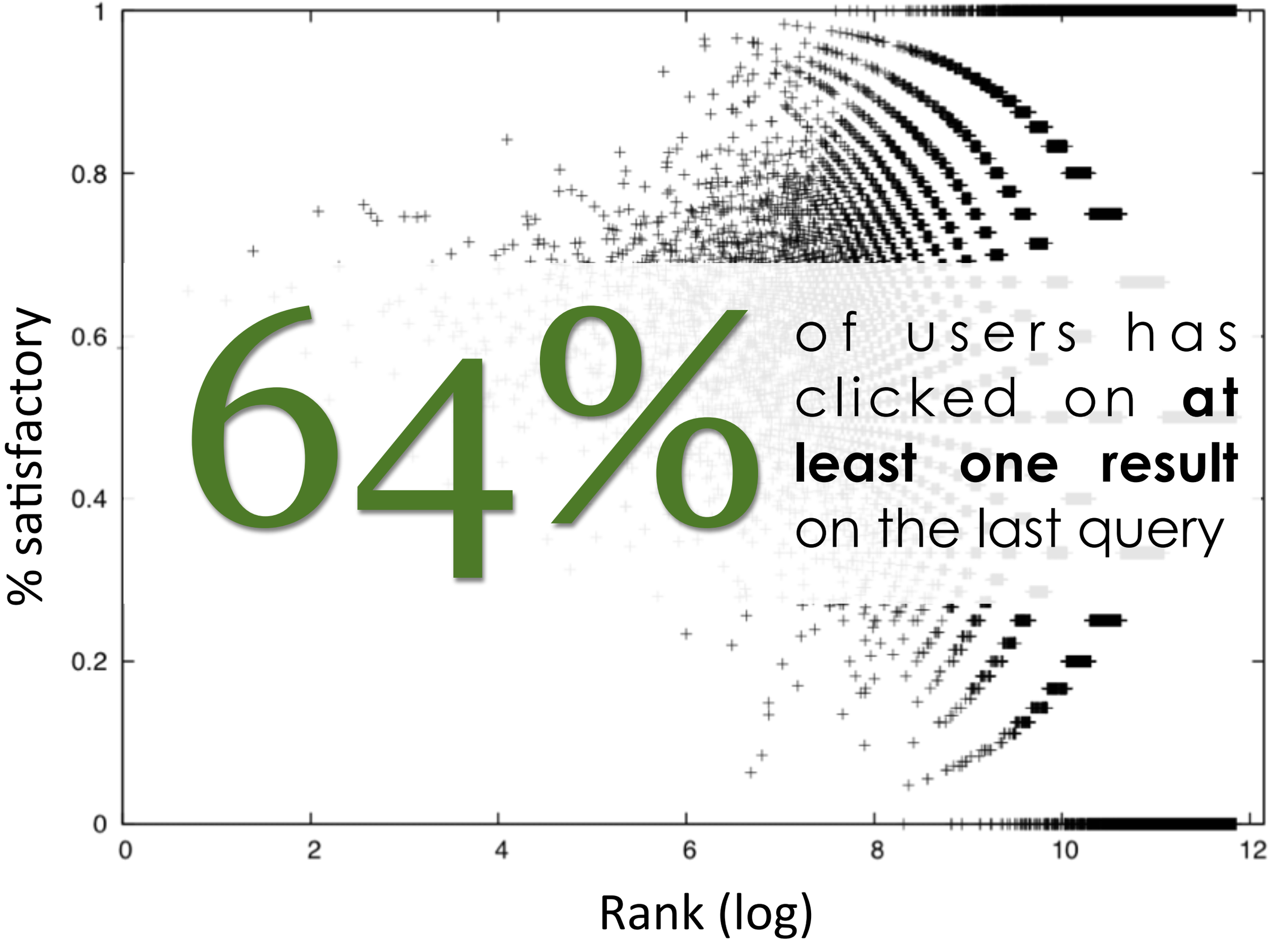
"bellagio hotel"

Last query of the session:
click on (at least) one result

“las vegas”

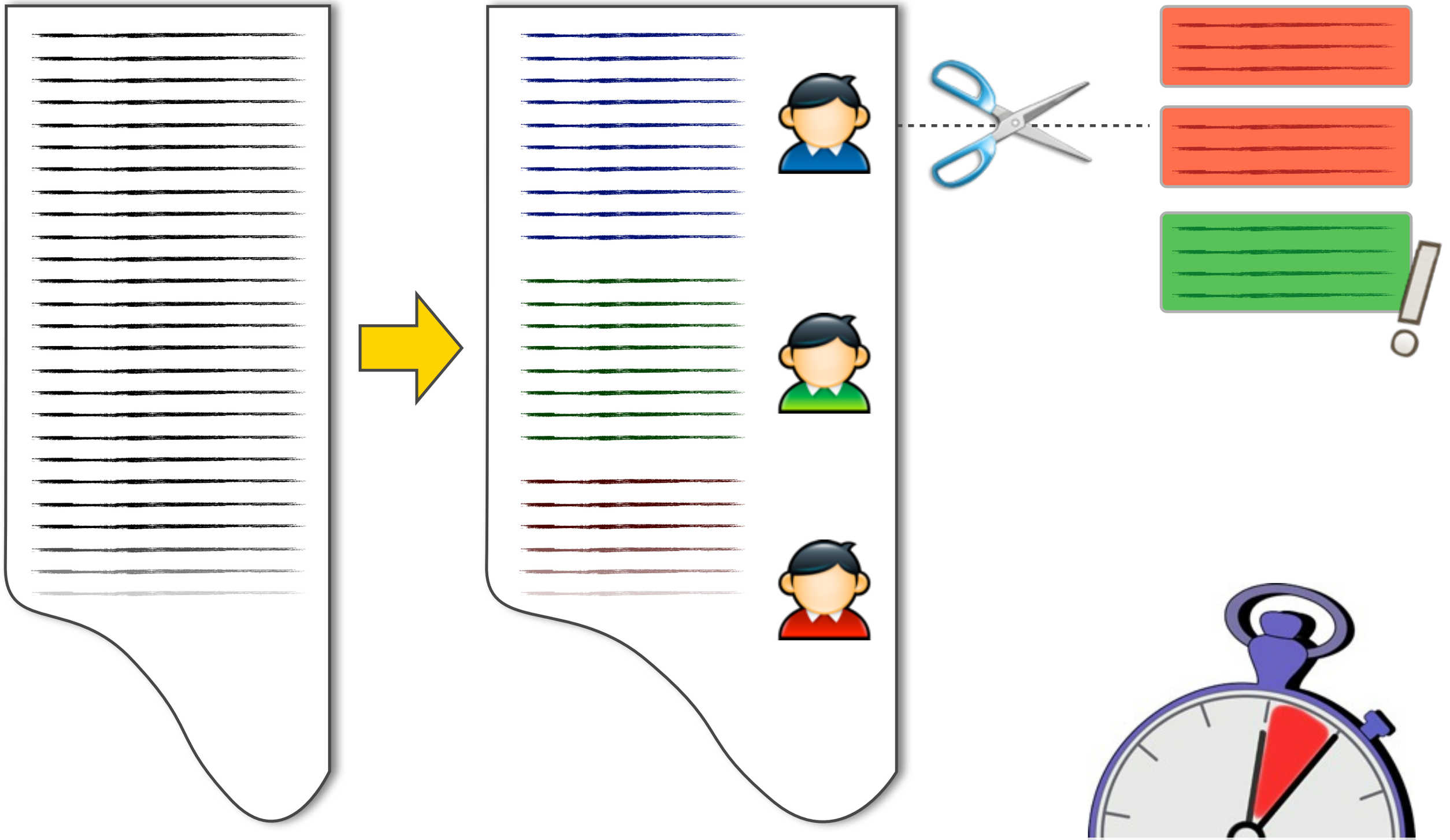
“**satisfactory**” session


% satisfactory
1
0.8
0.6
0.4
0.2
0
0
2
4
6
8
10
12
Rank (log)

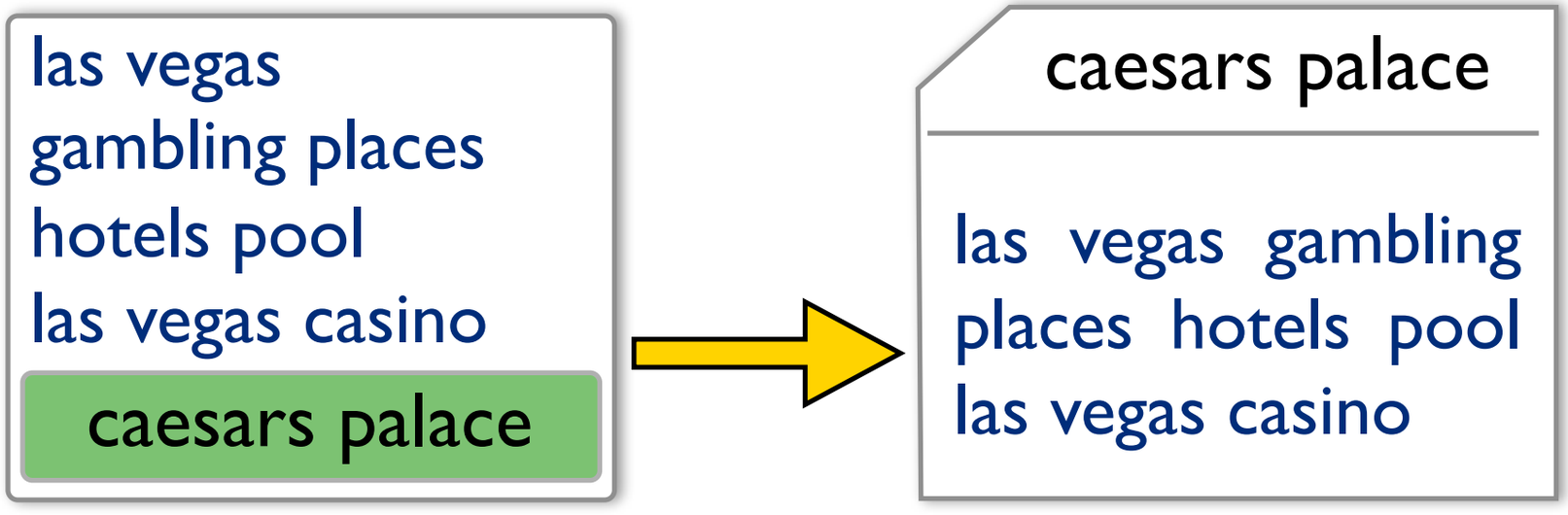

% satisfactory
1
0.8
0.6
0.4
0.2
0
0
2
4
6
8
10
12
Rank (log)
64%
of users has clicked on **at least one result** on the last query

“las vegas”

use as suggestion: *final query*
from other “**satisfactory**” sessions



5 minutes
each session



“las vegas hotels”

1. caesars palace

“poker gambling”

1. caesars palace

Suggestions ranking

$$w(\tau, q_{f_i}) = \alpha \cdot BM25(\tau, q_{f_i}) + \beta \cdot freq(q_{f_i})$$

IR-rank

popularity

$$\alpha = \beta = 1/2$$

14,921,286

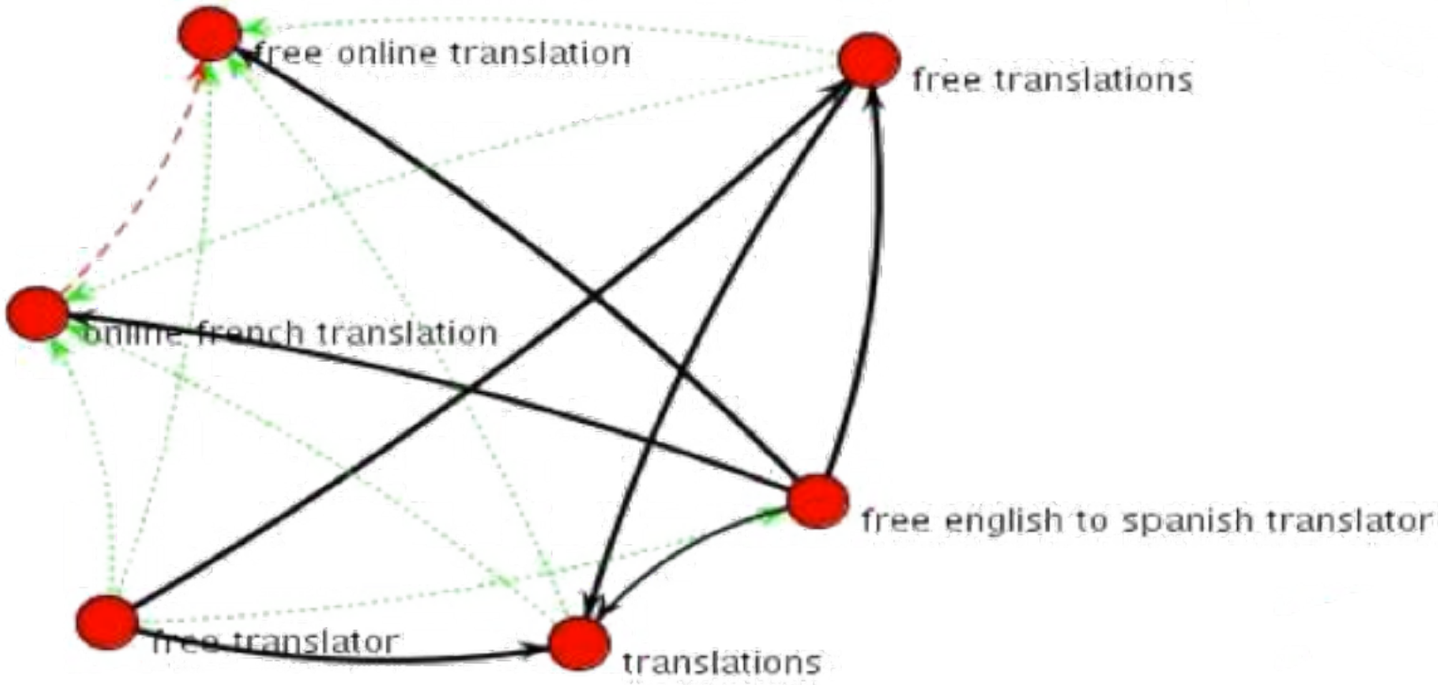
total queries from Microsoft log

9,461,423

sessions

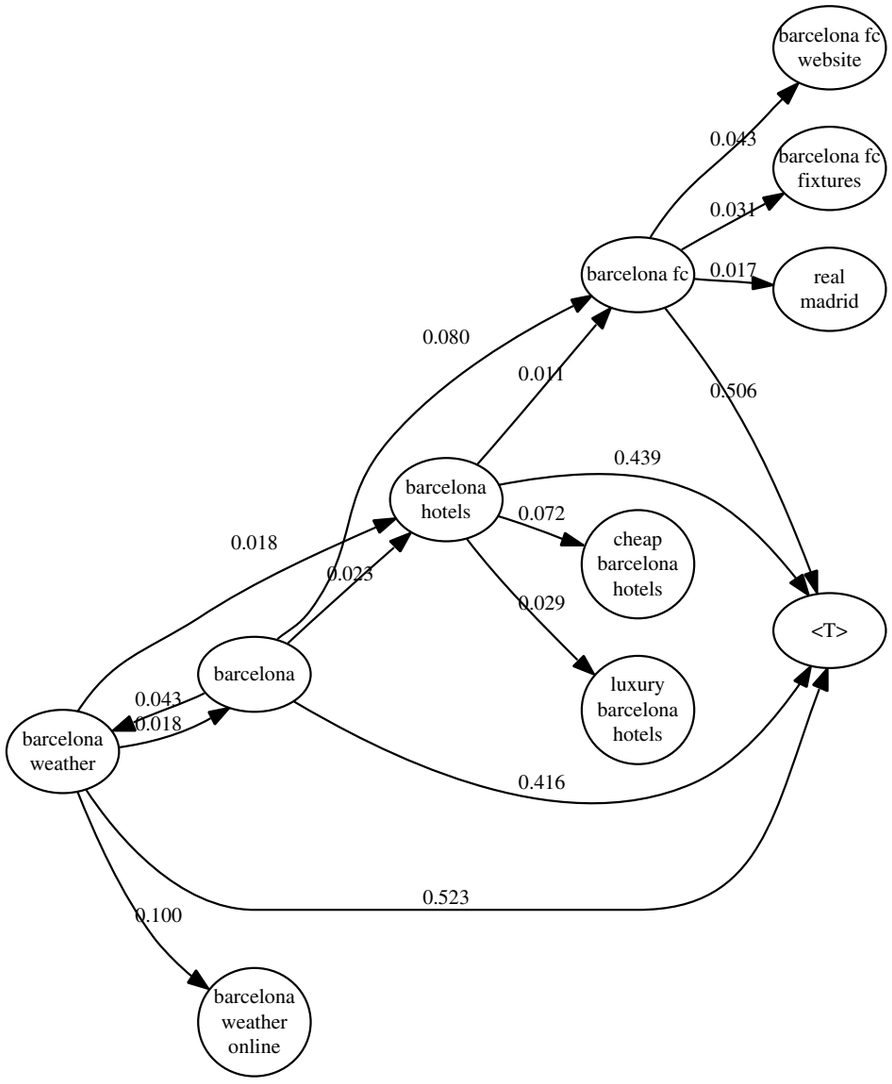
1,949,320

virtual documents



COVER GRAPH

Baeza-Yates *et al.*
KDD '07



QUERY FLOW GRAPH

Boldi *et al.*
CIKM '08

MANUAL EVALUATION

simple?

objective?

reproducible?

(TREC query no. 14)

"dinosaurs"

1. Go to the Discovery Channel's dinosaur site, which has pictures of dinosaurs and games.
2. I'm looking for free pictures of dinosaurs.
3. I want to find pictures of dinosaurs that I can color in, as in a coloring book.
4. I'm looking for a list of all (or many of) the different kinds of dinosaurs, with pictures
5. Take me to the homepage for the BBC series, "Walking with Dinosaurs"

(Search Shorctuts suggestions)

“dinosaurs”

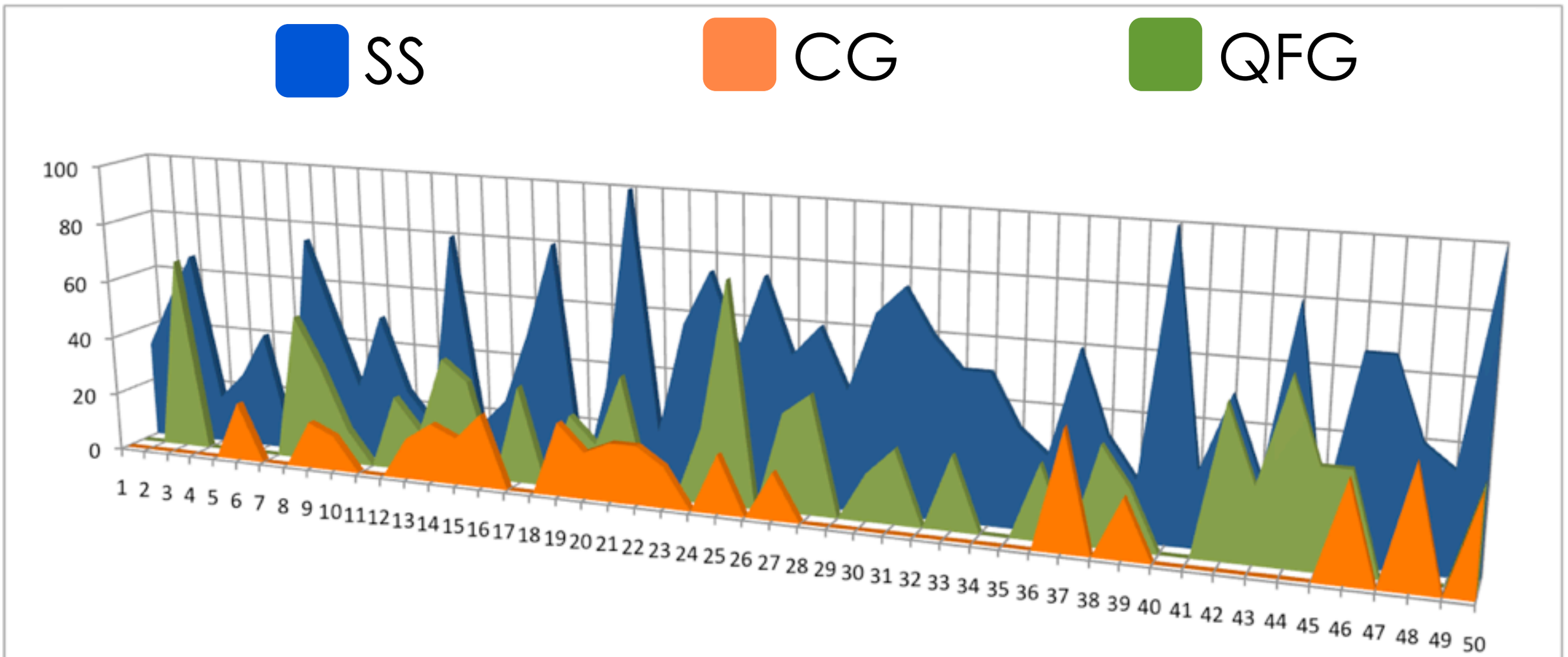
1. dinosaur pictures
2. dinosaur worksheets
3. dinosaur games
4. all about dinosaurs
5. walking with dinosaurs
6. poetry dinosaurs
7. dinosaur clip art
8. trooden dinosaurs
9. dinosaurs list
10. tyrannosaurus dinosaur

“I’m looking for free pictures of dinosaurs.” (sub-topic 2)

“Take me to the homepage for the BBC series, ‘Walking with Dinosaurs’.” (sub-topic 5)

“I want to find pictures of dinosaurs that I can color in, as in a coloring book.” (sub-topic 3)

“I’m looking for a list of all (or many of) the different kinds of dinosaurs, with pictures.” (sub-topic 4)



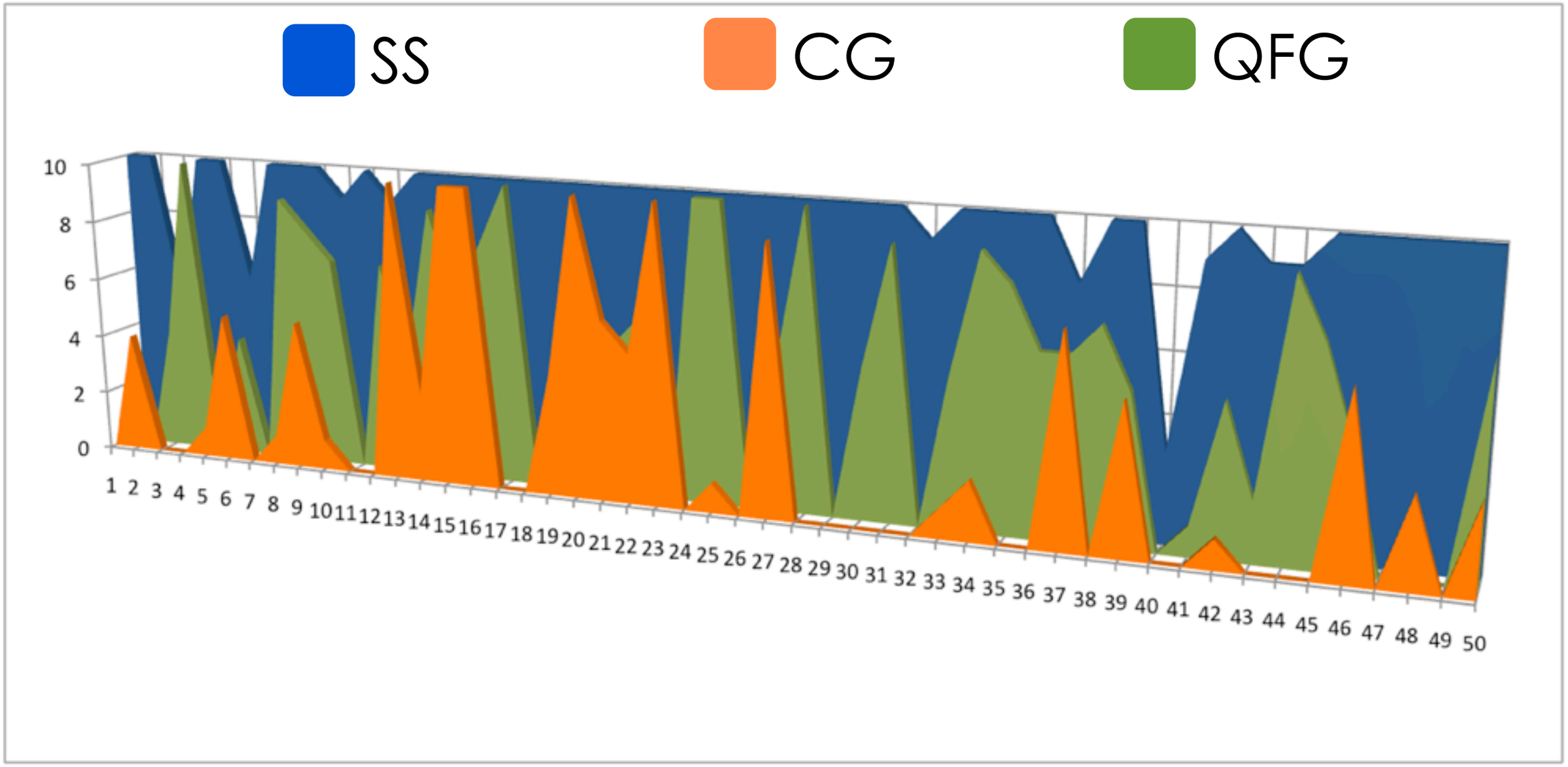
AVERAGE	**47.06**	> 50%	**27/50**
TOPIC	**18.76**	TOPIC	**5/50**
COVERAGE	**8.40**	COVERAGE	**0/50**

(Search Shortcuts) (TREC suggestions)

9/10
related suggestions

"map of the united states"

1. map of united states
2. blank map of the united states
3. map of united states of america
4. united states maps
5. outline map of the united states
6. united states of america map
7. printable united states map
8. united states region map
9. political map of the united states
10. updated wrestling news



AVERAGE PRECISION on 10 suggestions

9.52

4.72

2.46

The story so far...

Search Shortcuts: the idea and preliminary studies

How the idea becomes reality: the implementation

Ranking of suggestions

A new evaluation metric: topic coverage

of results

More details...

Daniele Broccolo, Lorenzo Marcon, Franco Maria Nardini, Raffaele Perego, Fabrizio Silvestri

Generating suggestions for queries in the long tail with an inverted index.

Information Processing & Management (2011)

doi:10.1016/j.ipm.2011.07.005

http://searchshortcuts.isti.cnr.it

SearchShortcuts

Current settings

Ranking model: BM25

Query: star wars submit

1.	star wars games
2.	star wars galaxies
3.	star wars characters
4.	star wars music
5.	lego star wars
6.	star wars models to buy
7.	star wars 3
8.	pics star wars
9.	all star wars toys
10.	star wars comics