

## Assignment 1

CS834, Information Retrieval, Fall 2017  
Old Dominion University, Computer Science Dept

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### Question 1:

Exercise 1.1:

Think up and write down a small number of queries for a web search engine. Make sure that the queries vary in length (i.e., they are not all one word). Try to specify exactly what information you are looking for in some of the queries. Run these queries on two commercial web search engines and compare the top 10 results for each query by doing relevance judgments. Write a report that answers at least the following questions: What is the precision of the results? What is the overlap between the results for the two search engines? Is one search engine clearly better than the other? If so, by how much? How do short queries perform compared to long queries?

### Answer:

To answer this question, the following queries were tested on both Google and Bing.

1. Stent
2. Ureteral stent
3. Ureteral stent procedure
4. Do ureteral stents cause pain?

I chose these queries because two weeks ago, I was told by the doctor that I need a “stent” to help pass a stone in my kidney. I had no idea what a stent is, so I asked what is a stent? and she explained. Let’s pretend that she did not and walked away.

I am going to start by the first query, and from the results, I am going to get the second query, and so on.

1. Stent:

A. Google:

Google found about 19,000,000 results. Skipping the ads and looking at the summary given by Google from the first result, I did not see that a stent is not related to kidney stones. The summary stated that a stent is a mesh tube that is used to treat narrow or weak arteries. I opened all of the first 10 results returned by Google and found that only the 7th result mentioned something about ureteral stents. Obviously, there are different types of stents for different purposes. I am specifically looking for something has some relation to kidney stones, but I was not specific enough for Google.

Precision is the fraction of retrieved documents that are relevant to the query. In other words, it is the number of correct results divided by the number of all returned results.

$$precision = \frac{|\{relevant\ documents\} \cap \{returned\ documents\}|}{|\{returned\ documents\}|}$$

$$precision = \frac{1}{10} = 0.1$$

Figure 1: Query: Stent, Search Engine: Google

stent - Google Search

https://www.google.com/search?source=hp&q=stent&btnK=Google+Search

Google

stent

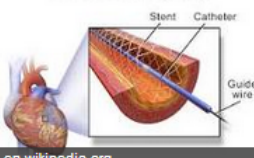
All News Images Videos Books More Settings Tools

About 19,000,000 results (0.82 seconds)

**Stent - Sentara Heart Omish Lifestyle**  
[omish.sentaraheart.com/heart-disease](http://omish.sentaraheart.com/heart-disease)  
Proven to Stop Heart Disease Progression. Speak With a Program Specialist Today!

**A **stent** is a small mesh tube that's used to treat narrow or weak arteries. Arteries are blood vessels that carry blood away from your heart to other parts of your body. A **stent** is placed in an artery as part of a procedure called percutaneous coronary intervention (PCI), also known as coronary angioplasty. Dec 17, 2013**

**Stent in Coronary Artery**



en.wikipedia.org

**What Is a Stent? - NHLBI, NIH**  
<https://www.nhlbi.nih.gov/health/health-topics/topics/stents>

About this result Feedback

**People also ask**

What is the procedure for a heart stent?	▼
What is a stent and what is it used for?	▼
How do they put a stent in the heart?	▼
What material is a heart stent made of?	▼

Feedback

## B. Bing:

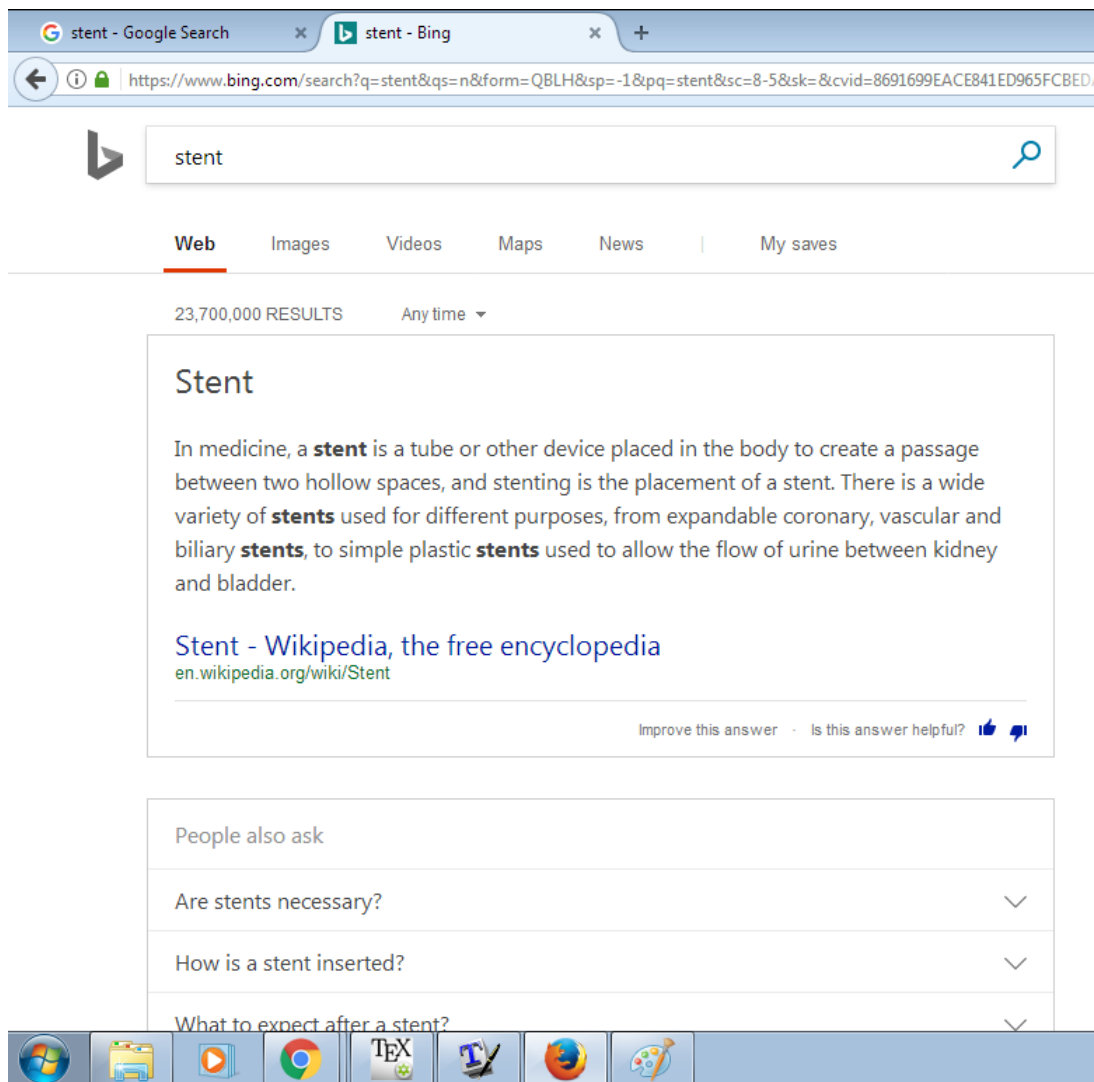
The query returned 23,700,000 result. The summary of the first result returned by Bing gave a general definition of a stent. Furthermore, it gave me exactly what I am looking for. In this case “stents used to allow the flow of urine between kidney and bladder”. In fact, The first result returned by Bing and the 7th result returned by Google are the same document, from wikipedia.org: <https://en.wikipedia.org/wiki/Stent>

Out of the 10 results returned by Bing, Only 3 talked about ureteral stents.

$$precision = \frac{|\{relevant\ documents\} \cap \{returned\ documents\}|}{|\{returned\ documents\}|}$$

$$precision = \frac{3}{10} = 0.3$$

Figure 2: Query: Stent, Search Engine: Google



**Overlap:** The following table shows the ordered results returned by each search engine. Overlaps are highlighted in matching colors.

Order	Google	Bing
1	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>
2	<a href="http://www.vox.com/2016/9/7/12815076/america-uninsured-rate-dropped?source=socnet_tw_aca_20160907_bo_uninsured-rate-low_vox_3&amp;utm_medium=social&amp;utm_source=tw_bo&amp;utm_campaign=socnet_tw_aca_20160907_bo_uninsured-rate-low_vox_3&amp;utm_content=20160907_bo_uninsured-rate-low_vox_3">http://www.vox.com/2016/9/7/12815076/america-uninsured-rate-dropped?source=socnet_tw_aca_20160907_bo_uninsured-rate-low_vox_3&amp;utm_medium=social&amp;utm_source=tw_bo&amp;utm_campaign=socnet_tw_aca_20160907_bo_uninsured-rate-low_vox_3&amp;utm_content=20160907_bo_uninsured-rate-low_vox_3</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>
3	<a href="http://www.vox.com/new-money/2016/10/21/13361414/median-wages?source=socnet_tw_econ_20161026_bo_wage-increase_durable_4&amp;utm_medium=social&amp;utm_source=tw_bo&amp;utm_campaign=socnet_tw_econ_20161026_bo_wage-increase_durable_4&amp;utm_content=20161026_bo_wage-increase_durable_4">http://www.vox.com/new-money/2016/10/21/13361414/median-wages?source=socnet_tw_econ_20161026_bo_wage-increase_durable_4&amp;utm_medium=social&amp;utm_source=tw_bo&amp;utm_campaign=socnet_tw_econ_20161026_bo_wage-increase_durable_4&amp;utm_content=20161026_bo_wage-increase_durable_4</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>
4	<a href="https://www.fisherwallace.com/?gclid=CNr-xNqt38UCFUU8gQodQHIAAsQ">https://www.fisherwallace.com/?gclid=CNr-xNqt38UCFUU8gQodQHIAAsQ</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>
5	<a href="http://www.nme.com/features/taylor-swift-power-fame-and-the-future-the-full-nme-cover-interview-549">http://www.nme.com/features/taylor-swift-power-fame-and-the-future-the-full-nme-cover-interview-549</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>

6	<a href="http://www.health.com/health/gallery/0,,20705881,00.html">http://www.health.com/health/gallery/0,,20705881,00.html</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>
7	<a href="http://www.mtv.com/vma/winners">http://www.mtv.com/vma/winners</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>
8	<a href="http://www.vox.com/energy-and-environment/2016/9/30/13111088/cleantech-costs-falling-one-chart?source=socnet_tw_cc_20161006_bo_clean-energy_technology_1&amp;utm_medium=social&amp;utm_source=tw_bo&amp;utm_campaign=socnet_tw_cc_20161006_bo_clean-energy_technology_1&amp;utm_content=20161006_bo_clean-energy_technology_1">http://www.vox.com/energy-and-environment/2016/9/30/13111088/cleantech-costs-falling-one-chart?source=socnet_tw_cc_20161006_bo_clean-energy_technology_1&amp;utm_medium=social&amp;utm_source=tw_bo&amp;utm_campaign=socnet_tw_cc_20161006_bo_clean-energy_technology_1&amp;utm_content=20161006_bo_clean-energy_technology_1</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>
9	<a href="https://www.washingtonpost.com/news/energy-environment/wp/2016/10/10/climate-change-has-been-making-western-forest-fires-worse-for-decades-study-says/?source=socnet_tw_cc_20161027_bo_energy-environment_climate_5&amp;utm_medium=social&amp;utm_source=tw_bo&amp;utm_campaign=socnet_tw_cc_20161027_bo_energy-environment_climate_5&amp;utm_content=20161027_bo_energy-environment_climate_5">https://www.washingtonpost.com/news/energy-environment/wp/2016/10/10/climate-change-has-been-making-western-forest-fires-worse-for-decades-study-says/?source=socnet_tw_cc_20161027_bo_energy-environment_climate_5&amp;utm_medium=social&amp;utm_source=tw_bo&amp;utm_campaign=socnet_tw_cc_20161027_bo_energy-environment_climate_5&amp;utm_content=20161027_bo_energy-environment_climate_5</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>

10	<a href="http://www.npr.org/sections/thetwo-way/2016/08/31/492177267/obama-at-lake-tahoe-praises-conservation-efforts?source=socnet_tw_cc_20160906_bo_npr-article_conservation_2&amp;utm_medium=socnet&amp;utm_source=tw&amp;utm_campaign=socnet_tw_cc_20160906_bo_npr-article_conservation_2&amp;utm_content=20160906_bo_npr-article_conservation_2">http://www.npr.org/sections/thetwo-way/2016/08/31/492177267/obama-at-lake-tahoe-praises-conservation-efforts?source=socnet_tw_cc_20160906_bo_npr-article_conservation_2&amp;utm_medium=socnet&amp;utm_source=tw&amp;utm_campaign=socnet_tw_cc_20160906_bo_npr-article_conservation_2&amp;utm_content=20160906_bo_npr-article_conservation_2</a>	<a href="http://www.boohoo.com/">http://www.boohoo.com/</a>
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### Included Files:

bowtie.png

### References

- [1] Python For Beginners. Available from World Wide Web:(<http://www.pythonforbeginners.com/>).
- [2] Cambridge University Press. Available from World Wide Web: (<http://nlp.stanford.edu/IR-book/html/htmledition/the-web-graph-1.html>).