

Human-Computer Interaction Design



COGS120/CSE170 - "Intro. HCI"

Instructor: Philip Guo

Week 8 - Information Foraging (2016-11-15)

some slides adapted from Scott Klemmer's Intro. HCI course

Learning Objective

use *information foraging* theory to understand user behavior and to design better user interfaces

Outline

- Information foraging theory
- User interface design to facilitate foraging
- User interface design to facilitate search

Animals can be herbivores,
carnivores, omnivores, etc.

Humans are *informavores*;
we thrive by consuming
information.

Information foraging theory =

*The study of how humans
forage for information in
similar ways as how animals
forage for food*

Animals

Goal: maximize expected energy intake (i.e., edible food) in a given limited time (or else starve!)

Explore vs. exploit: Should it keep looking around for more promising food sources, or spend time hunting/picking the current one?

Physical scent: some sensory indicator (e.g., visual, smells) that this source is promising, so it should spend more time here.

Humans

Goal: maximize expected useful information intake in a given limited time (or else #fail)

Explore vs. exploit: Should I keep looking around for more promising information sources, or spend time consuming the current one?

Information scent: some sensory indicator (e.g., usually visual) that this information source is promising, so I should spend more time here.

Information scent =
some sensory indicator
(e.g., usually visual) that this
information source is
promising, so users should
spend more time here

Good user interface design *maximizes information scent* to efficiently guide users toward promising sources of information and to keep them there until they are satisfied.

The rest of this lecture shows examples of this simple principle.

Your *home page* should provide useful, timely, and relevant links rather than just looking cool.

Amazon.com: Online Shopping x

https://www.amazon.com

amazon Try Prime

All

HOLIDAY TOY LIST Sponsored by Skylanders Imaginators

Hello. Sign in Account & Lists Orders Try Prime Cart

Sign in

New customer? Start here.

The best gifts tell a story

kindle paperwhite \$119⁹⁹

Welcome

Sign in for the best experience

Sign in securely

Holiday Gift Guides

Electronics Toys

Home Amazon Holiday Gifts

Amazon Echo and Alexa

amazon Prime Video now available for \$8⁹⁹/month

Learn more

Ad feedback

COUNTDOWN TO BLACK FRIDAY DEALS WEEK

Informative link text gives users an accurate indication of what to expect when they click

Bad link text: For more project info, click here

Better link text: Read some more project info

Even better: Read our project implementation details

Use the target audience's language when designing link and category labels (also good for search engine optimization)

amazon Try Prime

Men's Snow Boots

HOLIDAY

Hello. Sign in
Your Account

Departments

Your Amazon.com Today's Deals Gift Cards & Registry Sell Help

Amazon Fashion

WOMEN MEN GIRLS BOYS BABY LUGGAGE SALES & DEALS

Categories

Amazon Fashion

☐ Top Brands

Men

Clothing

Shoes

Athletic

Boots

Chelsea

Chukka

Motorcycle & Combat

Oxford & Derby

Western

Rain

Snow

Hiking

Hunting

Work & Safety

Fashion Sneakers

Loafers & Slip-Ons

Mules & Clogs

Outdoor

Oxfords

Sandals


Slippers

Work & Safety

Jewelry


MEN'S SNOW BOOTS

1-48 of 1,403 results for Clothing, Shoes & Jewelry : Men : Shoes : Boots : Snow




Columbia

Columbia Men's Bugaboot Plus III Omni ...
from \$84.95 Prime



SOREL

Sorel Men's Caribou II Boot
from \$90.56 Prime



SOREL

Sorel Men's Cheyanne Lace Full-Grain C...
from \$49.37 Prime

Breadcrumbs for hierarchical navigation

amazon Try Prime

Men's Snow Boots

HOLIDAY

Hello. Sign in
Your Account

Departments

Your Amazon.com Today's Deals Gift Cards & Registry Sell Help

Amazon Fashion

WOMEN MEN GIRLS BOYS BABY LUGGAGE SALES & DEALS

Categories

Amazon Fashion

Top Brands

Men

Clothing

Shoes

Athletic

Boots

Chelsea

Chukka

Motorcycle & Combat

Oxford & Derby

Western

Rain

Snow

Hiking

Hunting

Work & Safety

Fashion Sneakers

Loafers & Slip-Ons

Mules & Clogs

Outdoor

Oxfords

Sandals

Slippers

Work & Safety

Jewelry

MEN'S SNOW BOOTS

1-48 of 1,403 results for Clothing, Shoes & Jewelry : Men : Shoes : Boots : **Snow**

Columbia

Columbia Men's Bugaboot Plus III Omni ...
from \$84.95 Prime

SOREL

Sorel Men's Caribou II Boot
from \$90.56 Prime

SOREL

Sorel Men's Cheyanne Lace Full-Grain C...
from \$49.37 Prime

Facets for quickly refining/filtering items

[https://www.amazon.com/s/ref=lp_679307011_ex_n_12?rh=n%3A7141123011%2Cn%3A7147441011%2Cn%3A679255011%2Cn%3A679307011%2Cn%](#)

Refine by

Amazon Prime
☐ Prime

Shoe Size

4	4.5	5	5.5	6
6.5	7	7.5	8	8.5
9	9.5	10	10.5	11
11.5	12	12.5	13	13.5
14	14.5	15	15.5	16
16.5	17	17.5	18	18.5
19	19.5	20		

Brand

- ☐ Columbia
- ☐ SOREL
- ☐ Stride Rite
- ☐ KINGSHOW
- ☐ UGG Australia
- ☐ Kamik
- ☐ Muck Boot
- + See more

Occasion

- ☐ Dress
- ☐ Casual

Shoe Width

4A	3A	2A/B	C	D
E/2E	3E	4E	5E	

Closure

- ☐ Buckle
- ☐ Bungee
- ☐ Hook & Loop
- ☐ Lace-up
- ☐ Slip-On & Pull-On
- ☐ Zip

Color

UGG Australia
 UGG Australia Mens Neumel Boot
 from \$65.00 Prime

Sorel Men's Cheyanne Lace Rain Boot
 from \$75.99 Prime

Kamik Men's Greenbay 4 Cold-Weat...
 from \$59.56 Prime

MuckBoots Men's Arctic Pro Hunting...
 from \$129.00 Prime

Merrell Men's Moab Rover Waterpro...
 from \$108.83 Prime

Sorel Men's 1964 Premium T CVS B...
 from \$69.16 Prime

Columbia Men's Bugaboot Snow Boot
 from \$68.47 Prime

The Original MuckBoots Arctic Sport...
 from \$103.00 Prime

Northside Men's Moc Toe Boot
 from \$59.99 Prime

Columbia Men's Watertight Boot
 from \$79.99 Prime

Kamik Men's Greenbay 4 Cold-Weat...
 from \$59.56 Prime

Vasque Men's Gaiter Boot
 from \$149.95 Prime

Near-miss results to avoid blank pages

amazon Try Prime

Men's Snow Boots roller sandals

Departments Your Amazon.com Today's Deals Gift Cards & Registry Sell Help

Amazon Fashion WOMEN MEN GIRLS BOYS BABY LUGGAGE SALES & DEALS

1-16 of 4,155 results for "roller sandals"

Show results for

Men's Fashion >

- Men's Sandals
- Men's Athletic & Outdoor Sandals & Slides

Women's Fashion >

- Women's Flip-Flops
- Women's Sandals
- Women's Platform & Wedge Sandals
- Women's Athletic & Outdoor Sandals & Slides

Boys' Fashion >

- Boys' Skateboarding Shoes
- Boys' Sneakers
- Boys' Sandals

+ See All 24 Departments

Refine by

Amazon Prime

☐ Prime

Eligible for Free Shipping

☐ Free Shipping by Amazon


Price

\$ to \$ GO

Brand

We didn't find results for "roller sandals" in Men's Shoes .

Here are results from All Departments,


 Neo Reflexology Sandals | Ultimate Therapeutic Natural Stone Reflexology Slippers | Foot Acup by Neo Reflexology Sandals

\$18⁹⁵ Prime

FREE Shipping on eligible orders

★★★★☆


Product Feature
... GET THEM N
Health, Househ

 Oofos OOriginal Thong Sandal VIOLET (INCLUDES FREE FOOT ROLLER MASSAGER) by OOFOS

\$44⁹⁵ Prime

Some sizes are Prime eligible

FREE Shipping
Clothing, Shoes

 FootSpa Pro Plantar Fasciitis Insoles, Orthotic Insoles, Relief from Heel and Foot Pain, Insoles by FootSpa Pro

\$24⁹⁹ Prime

Get it by **Wednesday, Nov 16**


FREE Shipping on eligible orders

★★★★☆

Tools & Home I




Proactive recommendations to help users jump to other promising patches of information

[←](#) [→](#) [↺](#) [https://www.amazon.com/Kamik-Mens-Nationplus-Snow-Brown/dp/B00AZODBT8/ref=s_1_3?s=apparel&ie=UTF8&qid=1479172997&sr=1-3&nodelD=7147441011&keywords=sno...](#) [🔍](#) [☆](#)







Roll over image to zoom in

Size:
Select [Size Chart](#)










Color: Dark Brown
  

- Leather
- Imported
- Minus 40F Temperature rated
- Rubber sole
- Shaft measures approximately 10" from arch
- Platform measures approximately 0.75 inches
- Cold-weather boot with leather-and-rubber upper featuring 200B Thinsulate insulation and moisture-wicking lining
- Rustproof speed-lacing system

Customers who viewed this item also bought

Product Image	Product Name	Price Range
	Columbia	\$84.95 - \$134.94
	Ergodyne	\$12.30 - \$39.99
	Northside	\$58.50 - \$119.99
	Kamik	\$48.19 - \$89.99

Customers Who Bought This Item Also Bought


Product Image	Product Name	Rating & Count	Price Range
	Kamik Women's Momentum Snow Boot	★★★★★ 766	\$49.99 - \$109.99
	Kamik Women's Snowvalley Boot	★★★★★ 441	\$49.99 - \$164.93
	Men's Waterproof Rain Boot Mid Calf Winter Snow Warm Boots Garden Fishing Outdoor Shoes		
	Ergodyne N-Ferno 6823 Wind-Resistant Hinged Balaclava, Black	★★★★★ 1,646	
	Arctix Men's Essential Bib Overall	★★★★★ 552	\$26.95 - \$69.99
	Kamik Women's Shellback Insulated Winter Boot	★★★★★ 72	\$50.21 - \$99.69
	Arctix Men's SnowSports Cargo Pants	★★★★★ 1,172	\$18.99 - \$106.77
	Northside Women's Kathmandu Waterproof Snow Boot	★★★★★ 358	
	Carhartt Men's W.P. Waterproof Insulated Work Glove	★★★★★ 1,058	

Page 1 of 11

Proactive recommendations to help users jump to other promising patches of information (with autoplay!!!)

← → ↻ 🔒 https://www.youtube.com/watch?v=3ElbWjkimAs ☆

☰ YouTube cat video 🔍 Upload Sign in



Funny Cats Compilation (Most Popular) Part 1

NoCAT NoLiFE [Subscribe](#) 36,372

9,508,893 views

+ Add to ➦ Share ⋮ More

Published on Feb 15, 2016

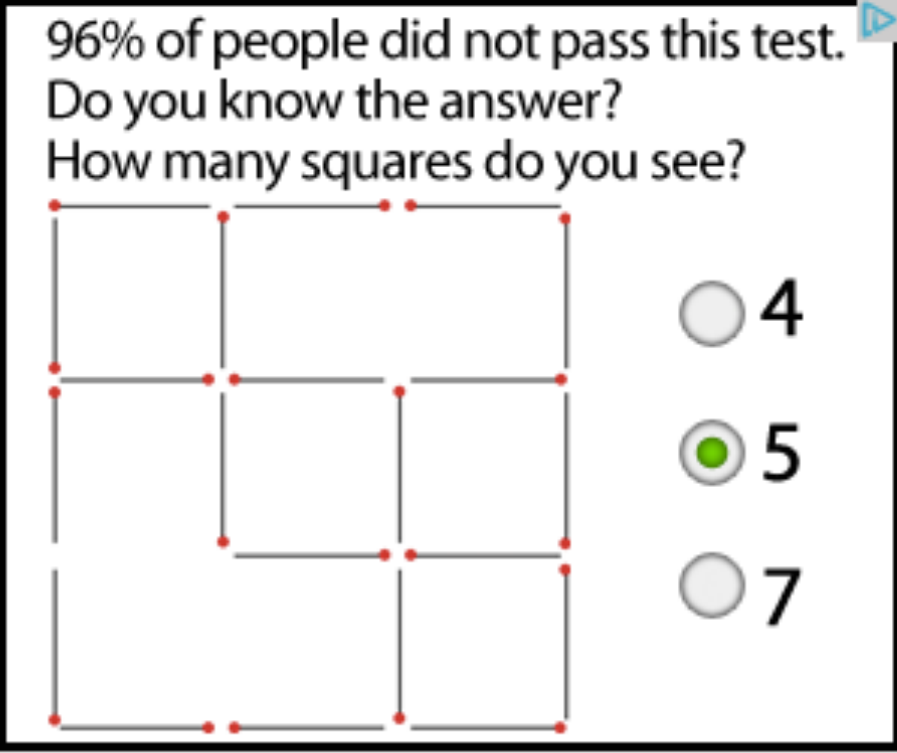
- Subscribe for NoCAT NoLiFE: <https://goo.gl/o06Pz5>
- Facebook FANPAGE: <https://www.facebook.com/NoCatNoLifeC...>
- DONATE my PayPal: <https://goo.gl/EPNWfV>

SHOW MORE

COMMENTS • 3,581

Add a public comment

96% of people did not pass this test. Do you know the answer? How many squares do you see?



Up next Autoplay ☒

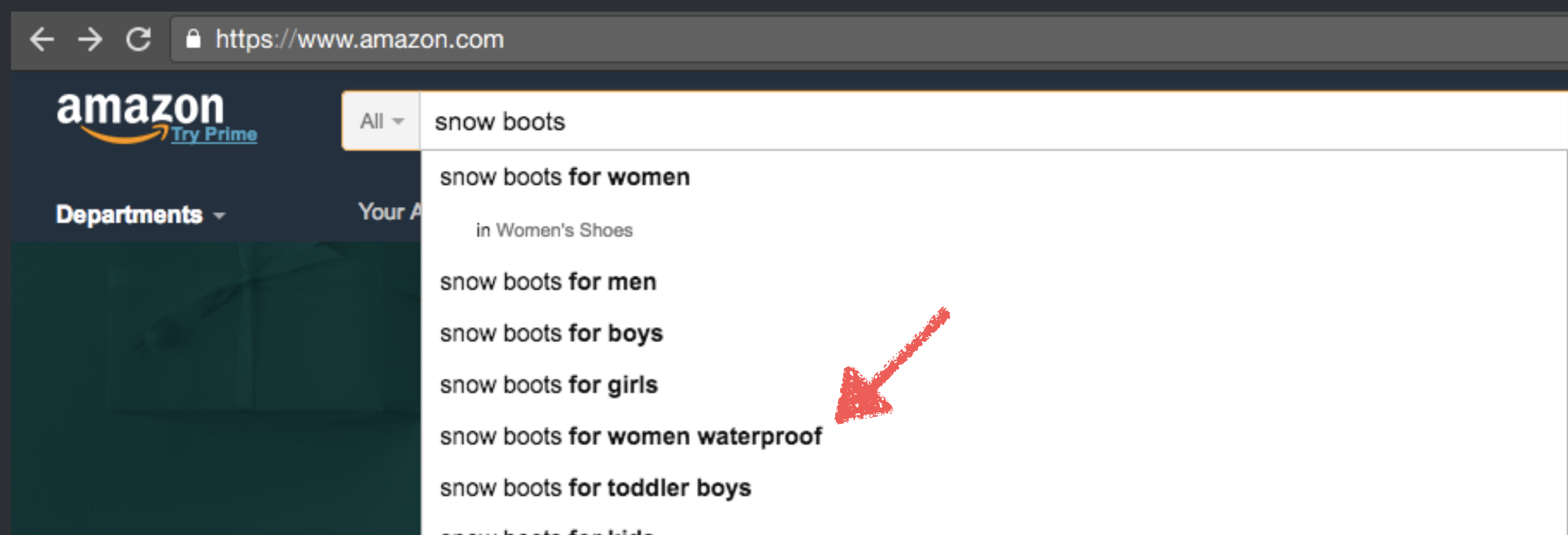
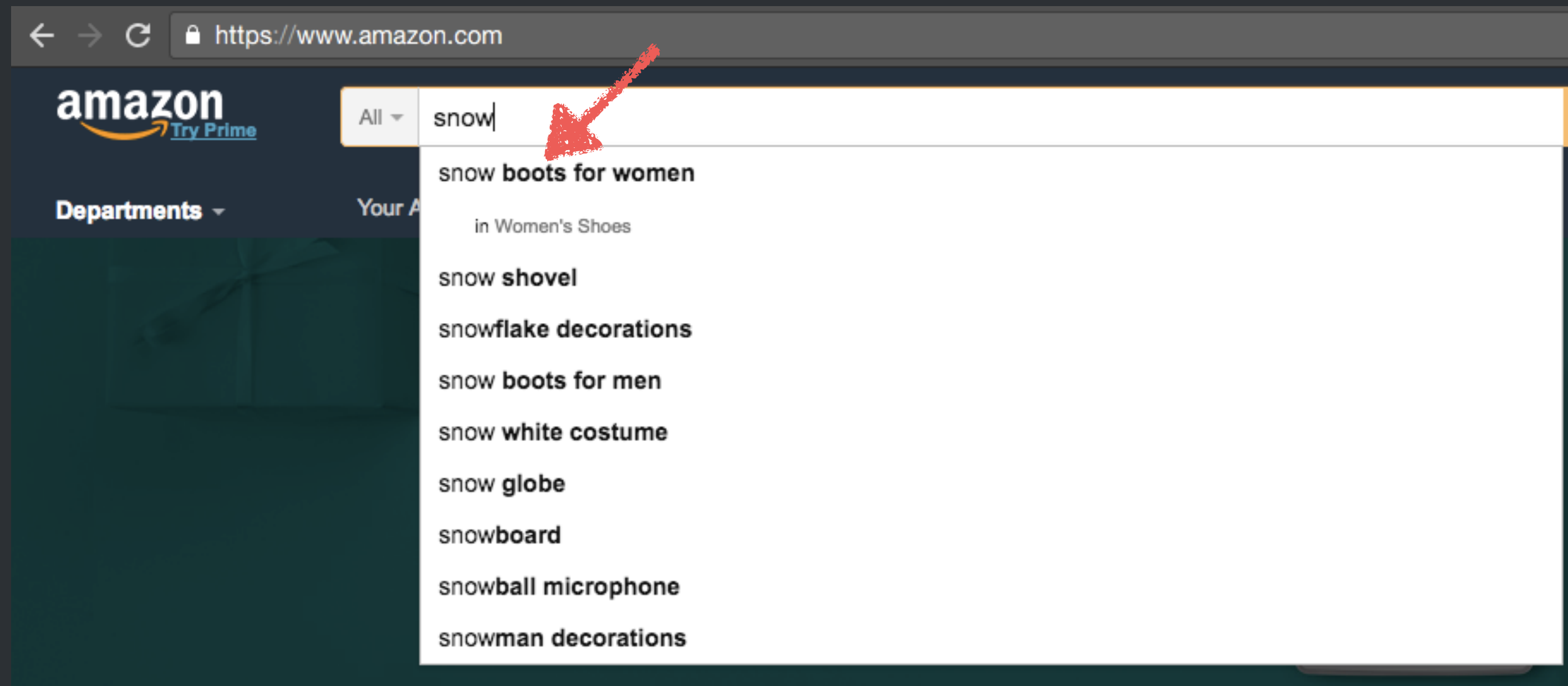
TRY NOT TO LAUGH OR GRIN - Funny Cat & Dog Compilation
Life Awesome
9,005,837 views
11:26

Top 10 Magic Trick - Funny videos 2016 [POKEMON GO]
Just For Fun
80,860,689 views
32:25

Funny Cat Videos - Cat Vines Compilation
Channel for Kids
15,703,375 views
14:58

Talking Tom and Friends Colors Reaction Compilation Cat and
Cartoon Games & Surprise Toys
6,650,694 views
18:15

Instant search helps users make better and even different queries. Let's say I don't know whether to call something "snow shoes" or "snow boots" ... search for "snow":

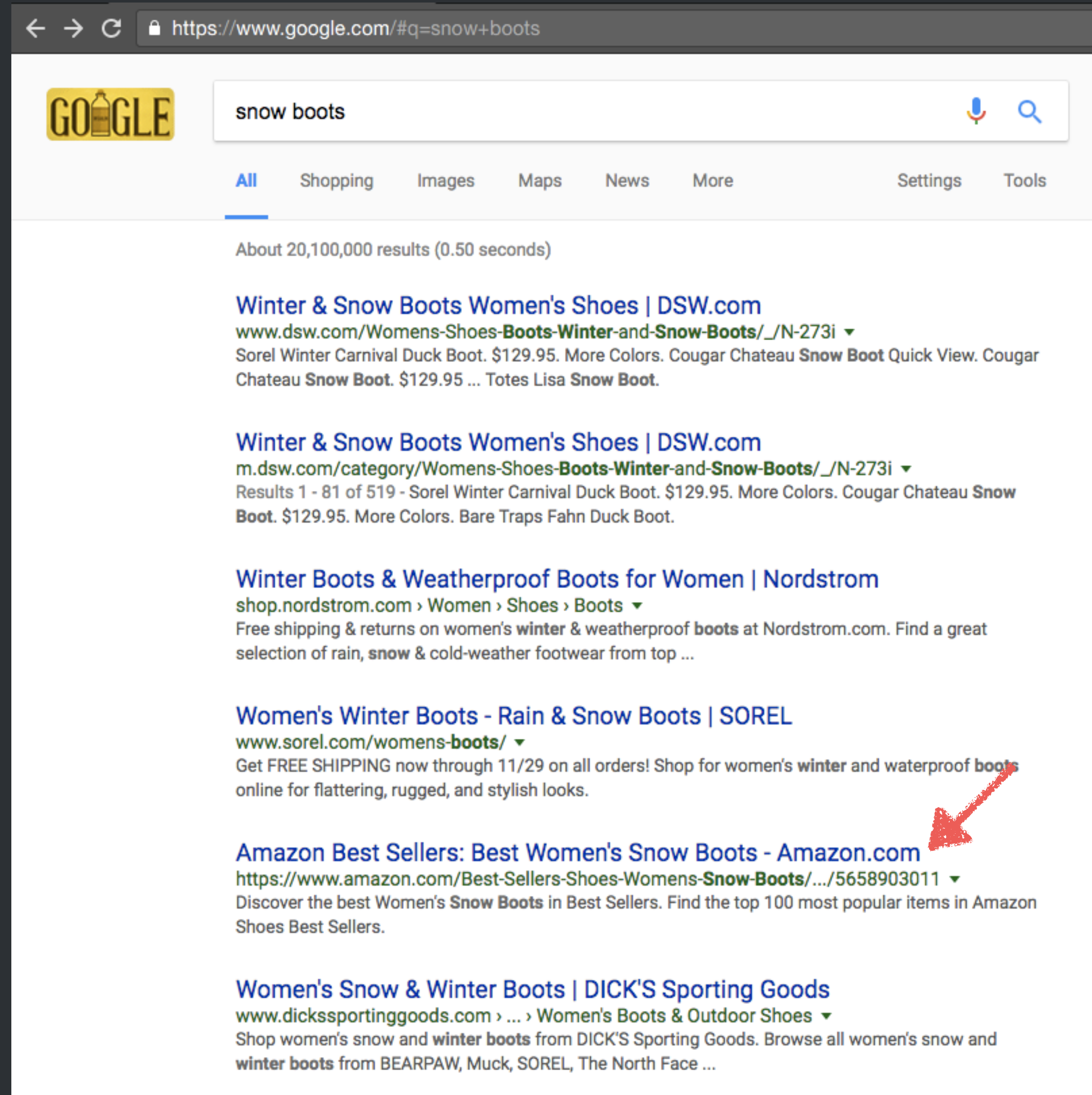


Ahh, I didn't know "waterproof" was a kind of snow boot, but it makes total sense once I see it!

Your home page should provide useful, timely, and relevant links rather than just looking cool.

The screenshot shows the Amazon.com homepage with a teal header. The main navigation bar includes the Amazon logo, a search bar, and links for 'HOLIDAY TOY LIST' (Sponsored by Skylanders Imaginators), 'Hello. Sign in Account & Lists', 'Orders', 'Try Prime', and a shopping cart. A large banner features the text 'The best gifts tell a story' and 'kindle paperwhite \$119.99', accompanied by images of two Kindle Paperwhite devices. Below the banner, the page is divided into several sections: 'Welcome' with a 'Sign in securely' button; 'Holiday Gift Guides' featuring 'Electronics' (laptop), 'Toys' (robot), 'Home' (gift box and glass), and 'Amazon Holiday Gifts' (red bow); 'Amazon Echo and Alexa' with an image of an Echo device; a 'Prime Video now available for \$8.99/month' promotion with a 'Learn more' button; and a 'COUNTDOWN TO BLACK FRIDAY DEALS WEEK' banner. A small 'Ad feedback' link is visible in the bottom right corner.

... but many users will come to your site via a search engine rather than your home page



... but many users will come to your site via a search engine rather than your home page


← → ↻ <https://www.amazon.com/Best-Sellers-Shoes-Womens-Snow-Boots/zgbs/shoes/5658903011>

amazon Try Prime

Clothing, Shoes & Jewelry







Departments ▾ Your Amazon.com Today's Deals Gift Cards & Registry Sell Help

Amazon Fashion | WOMEN MEN GIRLS BOYS BABY LUGGAGE SALE


Amazon Best Sellers 
Our most popular products based on sales. Updated hourly.

◀ Any Department
◀ Shoes
◀ Women's
Outdoor
Climbing
Hiking & Trekking
Hunting
Rain Footwear
Snow Boots
Sport Sandals & Slides
Trail Running
Water Shoes

Best Sellers in Women's Snow Boots

- 
UGG Australia Women's Bailey Button
★★★★★ 1,829
\$108.00 - \$169.95
- 
Susanny Suede Flat Platform Sneaker...
★★★★☆ 17
\$12.69 - \$27.69
- 
Winter Fur Snow Boots Warm Sneakers for...
★★★★☆ 33
\$7.02 - \$18.48
- 
Sorel Women's Winter Carnival Boot
★★★★☆ 359
- 
Womens Snow Boot Nylon Tall Winter Snow...
★★★★☆ 489
- 
Columbia Women's Ice Maiden II Winter...
★★★★☆ 1,313

Stop losing your glasses and try Readerest today.



The lucrative art of “search engine optimization” (SEO): getting your best, most timely, most attractive content onto the highest possible search results

Easy: you can pay for better search results

← → ↻ 🔒 https://www.google.com/search?q=snow+boots&oeq=tabagon&aqs=chrome..69i57.1150j0j9&sourceid=chrome&ie=UTF-8#q=snow+boots

GOOGLE snow boots 🔍

All Shopping Images Maps News More ▾ Search tools ⚙️

About 20,300,000 results (0.42 seconds)

Winter Boots On Sale Today - Up To 70% Off Winter Gear

Ad www.sierratradingpost.com/WinterBoots/StayWarm ▾
4.7 ★★★★★ rating for sierratradingpost.com
Shop With Confidence - Over 30 Years Experience Premium Selection Of **Snow Boots**
Women's Winter Boots · Men's Winter Boots · Clearance Items · DealFlyer Savings · New Items

Women's Winter Boots - Free Shipping & Easy Returns - nordstrom.com

Ad shop.nordstrom.com/Women/Boots ▾
4.6 ★★★★★ rating for nordstrom.com
Shop from a Collection of **Boots** in Different Colors, Sizes, Styles and Designs.
Brands: Aquatalia, Munro, Paul Green, Fly London, Jeffrey Campbell
Ratings: Service 9.5/10 - Returns 9.5/10 - Product quality 9.5/10 - Shipping 9/10 - Selection 9/10
Earn Up To A \$200 Note · Top Shoe Trends · Men's Shoes · Women's Shoes · Flats

Women's Snow & Winter Boots - Available At DICK'S Sporting Goods

Ad www.dickssportinggoods.com/Footwear ▾
4.6 ★★★★★ rating for dickssportinggoods.com
Shop Our Official Site Today!
Ratings: Shipping 9/10 - Service 9/10 - Selection 9/10 - Returns 9/10 - Product quality 9/10

Snow Boots At Target™ - Shop & Save Today

Ad www.target.com/Footwear/Boots ▾
Buy **Snow Boots** Now. Free Shipping On All Orders!

Winter & Snow Boots Women's Shoes | DSW.com









www.dsw.com/Womens-Shoes-Boots-Winter-and-Snow-Boots/_/N-273i ▾
Sorel Winter Carnival Duck Boot. \$129.95. More Colors. Cougar Chateau **Snow Boot** Quick View.
Cougar Chateau **Snow Boot**. \$129.95 ... Totes Lisa **Snow Boot**.

Winter Boots & Weatherproof Boots for Women | Nordstrom

shop.nordstrom.com › Women › Shoes › Boots ▾
Free shipping & returns on women's **winter** & weatherproof **boots** at Nordstrom.com. Find a great selection of rain, **snow** & cold-weather footwear from top ...

Shop for snow boots on Google

Sponsored ⓘ

 <p>Women's L.L.Bean ... \$119.00 L.L.Bean Special offer</p>	 <p>Lane Bryant Tall Faux Fur ... \$79.95 Lane Bryant</p>	 <p>SOREL Joan of Arctic Women'... \$179.95 Zappos.com ★★★★★ (117)</p>	 <p>Totes Suzanne Women's ... \$64.99 Kohl's Special offer</p>
 <p>Totes Sharon Women's ... \$44.99 Kohl's Special offer</p>	 <p>Women's Neida Winter Boots - \$44.99 Target Special offer</p>	 <p>Vanish Cold Weather Boot \$49.95 Stein Mart</p>	 <p>Columbia Minx Mid II Omni-... \$74.95 Backcountr... Special offer</p>

Basic search engine optimization (SEO) for free: Create good content, and *use words that your audience will likely use*.

← → ↻ 🔒 https://www.google.com/search?q=python+tutor&oq=python+tutor&aqs=chrome..69i57j69i60l2j69i59.111

GOOGLE python tutor 🔍

All Videos Books News Images More ▾ Search tools

About 536,000 results (0.40 seconds)

Affordable Python Tutors - In-Home Expert Tutors From \$25
Ad www.wyzant.com/Python ▾
4.8 ★★★★★ rating for wyzant.com
Python Tutors on WyzAnt Offer Affordable 1-on-1 Instruction. Find One Today.
More Than 75,000 Tutors · 100% Good Fit Guaranteed! · Simple & Secure · Tutors From \$25/Hr
Services: Elementary Tutoring, 1-on-1 K-12 Tutors, High School Tutoring, College Tutoring, Adult Edu...
Find a Local Tutor How It Works
100% Good Fit Guarantee Reviews & Testimonials

Online Python Tutoring - Ask Expert Python Tutors Questions
Ad python.chegg.com/Tutors/ ▾ (855) 411-5743
Live, Online, 24/7. Ace Your Exam!
Tutors from top colleges · Available 24/7 · Free trial for new users · Instant access to tutors
Download Tutoring App · Pricing · Become An Online Tutor · Are You a Parent?

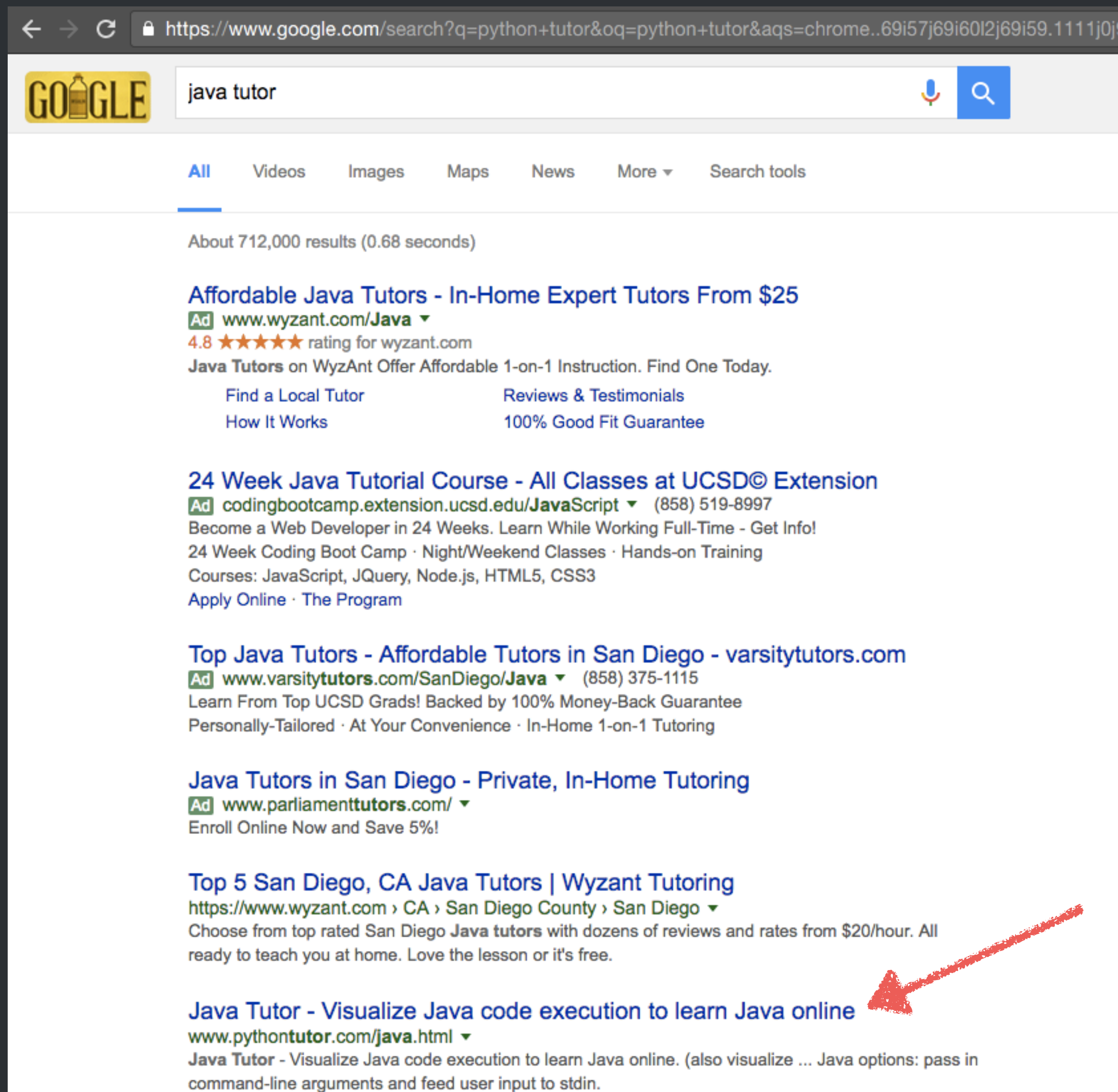
Python Tutor - Visualize Python, Java, JavaScript, TypeScript, Ruby, C ...
pythontutor.com/ ▾
Jun 8, 2014 - Python Tutor, created by Philip Guo, helps people overcome a fundamental barrier to learning programming: understanding what happens as ...

Visualize Visualize Execution Live Programming Mode (NEW ...	Online Python Tutor Python 3.3. and ... Privacy Policy: By using Online Python Tutor ...
Live Programming Mode This is the live programming mode of Python Tutor, which ...	JavaScript JavaScript Tutor - Visualize JavaScript code execution to ...

[More results from pythontutor.com »](#)

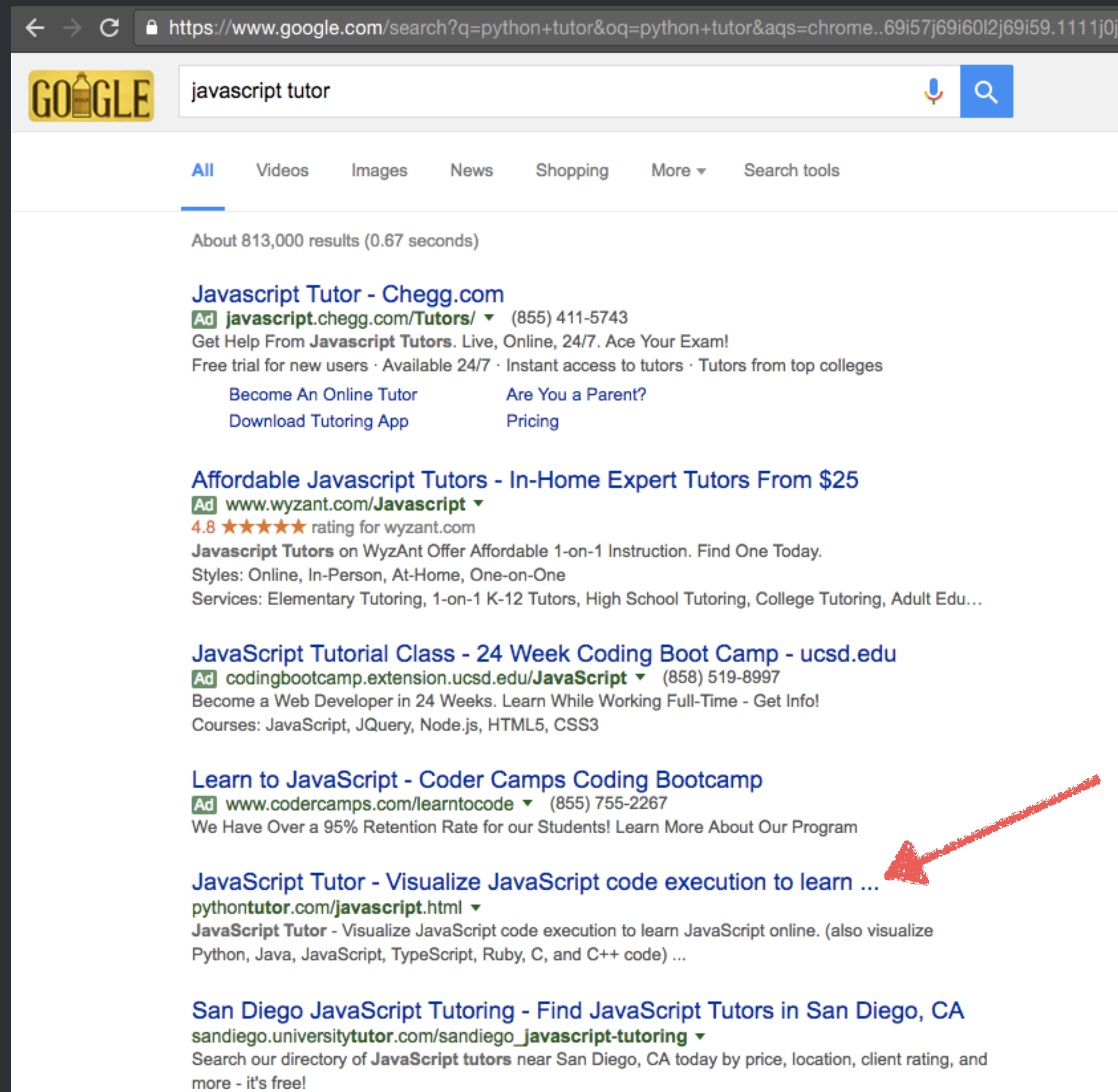
The Python Tutorial — Python 3.5.2 documentation
<https://docs.python.org/3/tutorial/> ▾
Python is an easy to learn, powerful programming language. ... This tutorial introduces the reader

Basic search engine optimization (SEO) for free: Create good content, and *use words that your audience will likely use*.



Create alternate landing pages with custom titles and relevant subset of content.

Basic search engine optimization (SEO) for free: Create good content, and *use words that your audience will likely use.*



Create alternate landing pages with custom titles and relevant subset of content.

... but unethical search engine optimization (SEO) will get you punished by Google, which has lots of ways to detect such schemes.

← → ↻ ⓘ news.bbc.co.uk/2/hi/technology/4685750.stm

BBC NEWS

▶ Watch **One-Minute World News**

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Your news when you want it

News Front Page



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Entertainment
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Last Updated: Monday, 6 February 2006, 15:31 GMT

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🖨️ Printable version

BMW given Google 'death penalty'

Search giant Google has "blacklisted" German car manufacturer BMW for breaching its guidelines.

Investigations by Google found that BMW's German website influenced search results to ensure top ranking when users searched for "used car."

Google has now reduced BMW's page rank to zero, ensuring the company no longer appears at the top.



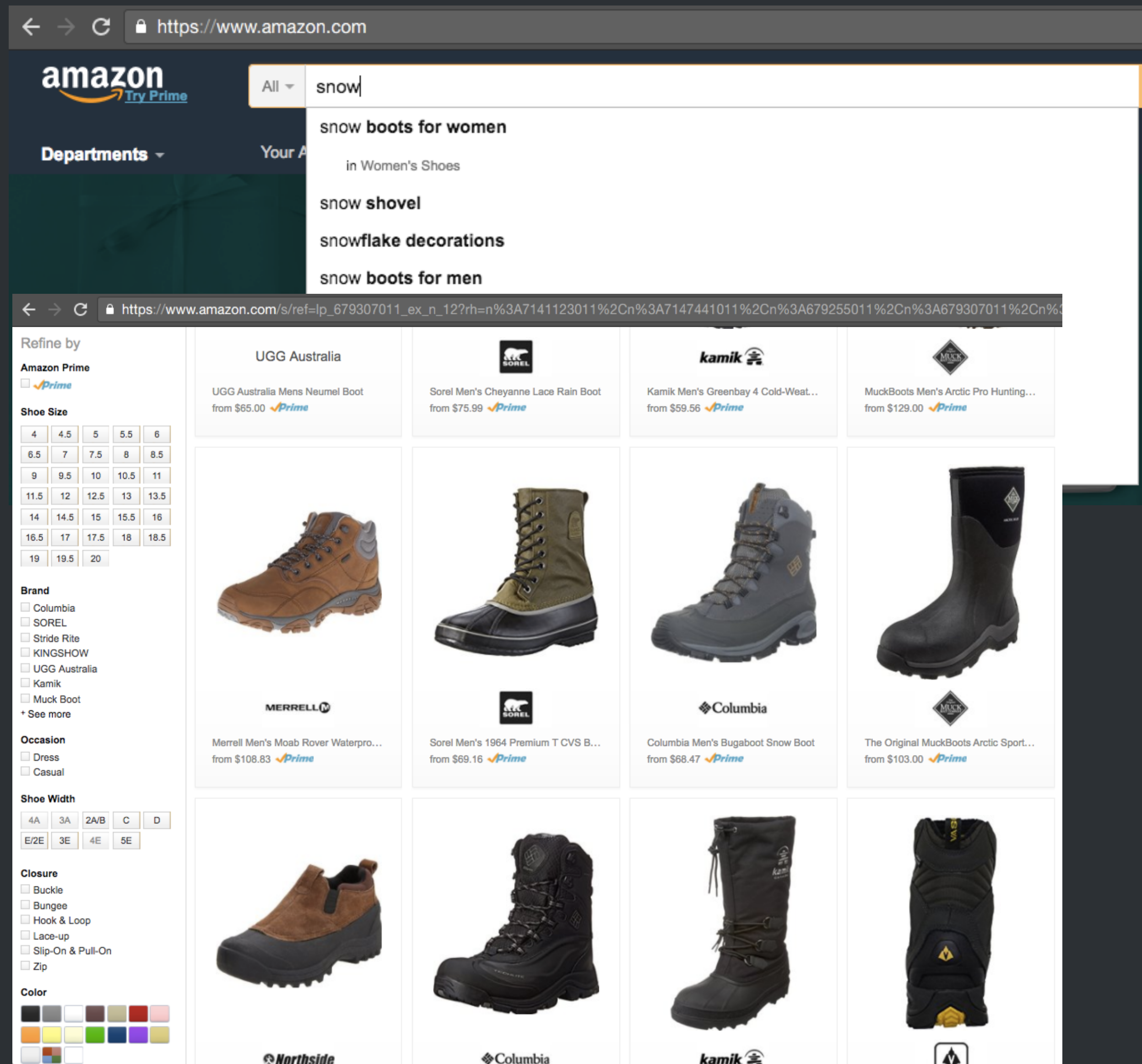
SEE ALSO:

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- ▶ Google defies US over search data 20 Jan 06 | Technology
- ▶ Google taps into search patterns 22 Dec 05 | Technology

Review:

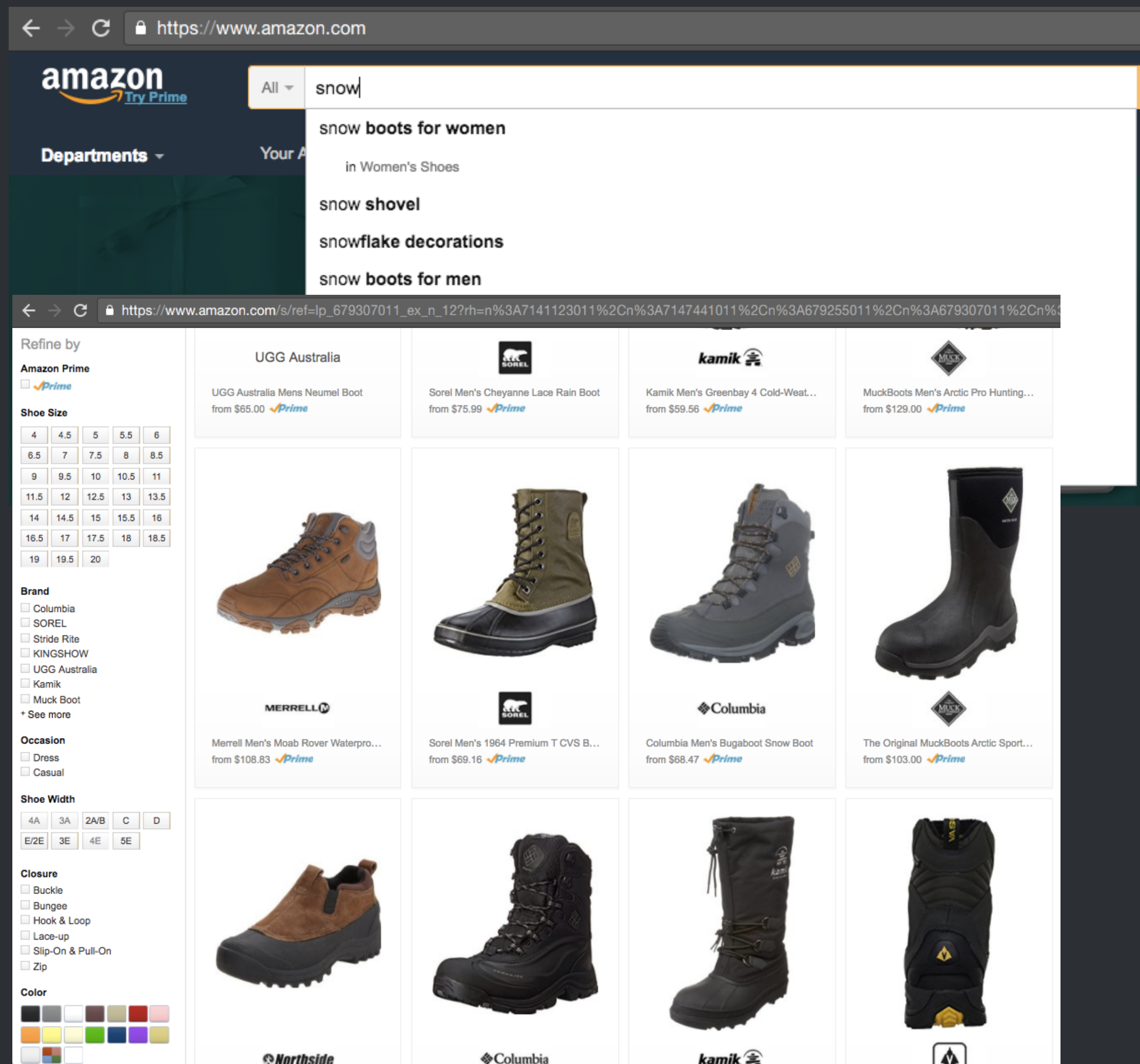
Good user interface design *maximizes information scent* to efficiently guide users toward promising sources of information and to keep them there until they are satisfied.

Final word: How can we make effective user interface designs at real-world scales?



Requires people with *HCI/ design, data science, and engineering* expertise to work together on a unified system! No single skill is enough to make this work at scale. Must respect and leverage all disciplines together.

Corollary: learn these other skills, even if you don't intend on becoming an expert!



Requires people with *HCI/ design, data science, and engineering* expertise to work together on a unified system! No single skill is enough to make this work at scale. Must respect and leverage all disciplines together.

Corollary: learn these other skills, even if you don't intend on becoming an expert!

HCI/Design

COGS 120/
CSE 170

Data Science

COGS 9, COGS 133

Engineering

COGS 121, CSE courses



Learning Objective

use *information foraging* theory to understand user behavior and to design better user interfaces

TODOs after class

- Exam 2 on Thursday
- Check grades Google Spreadsheet for accuracy