

23/24 OCTOBER | BRIGHTON

brightonSEO.
United Kingdom

A woman with long brown hair, wearing glasses and a black turtleneck, is smiling and gesturing with her hands. She is standing in front of a white background with colorful geometric shapes (blue, yellow, orange) to her right.

Lazarina Stoy

MLFORSEO

AI-powered/ML-enabled Semantic Keyword Research for the AI Era

A small teal plus sign is located in the bottom right corner of the slide, next to a red and orange diagonal stripe.

Keyword research is the **starting point** of all organic marketing projects.

It uncovers **how**, **why**, and **when** your target customer searches for and discovers businesses like yours online.

It can also help you understand what that **target customers' needs** are based on their searches alone.

OLD WAY

- Keyword targetting

-
- Keyword stuffing

-
- Keyword Density

-
- Suitability assessment based on Keyword difficulty

VS

NEW WAY

- Focus on brand-relevant concepts

-
- Understand the user's content format needs

-
- Understand the user's information needs (intent)

-
- Suitability assessment based on content production abilities

@lazarinastoy

While before, the focus of keyword research was to discover keywords to target on a page, nowadays the aim is

- ✓ understanding the users' content and information needs,
- ✓ what the brands' content production abilities are
- ✓ how to appear in a relevant way on different platforms.

In other words, the way brands approach content production has also changed as a result of changes in search engine algorithms and user preferences.

User-centric organizations **don't** create content on everything, everywhere for a given topic.

Instead, they use **semantic keyword research** and **user research** to know
where to appear (platform-wise),
with what type of content,
what information to include, and
with **what brand voice** to present that information with to users.

Unlike traditional keyword research (which prioritizes metrics),
semantic keyword research focuses on real-world user
behavior,
placing the searchers thoughts and actions at the center.

Semantic keyword research aims to uncover **real-world context** by emphasizing the user's search journey and the context surrounding their search.

The aim is to understand not only what users type in the search bar but also:

- Why they search
- What prompted them to search
- What content they expect to see
- What platform they expect to get their information needs met on
- What content format they prefer
- How their searches connect to one another
- What are the intrinsic motivations of them performing this search
- What information they already have on the topic



Traditional keyword research	VS	Semantic keyword research
- Keywords - Keyword length - Keyword search volume - Keyword difficulty - Traffic potential - Competition		- Entities, entity attributes, entity attribute values - Query sequence - Query path - Query augmentation - Query context - Session context - User search behavior - Information gain - Search intent - Knowledge graphs

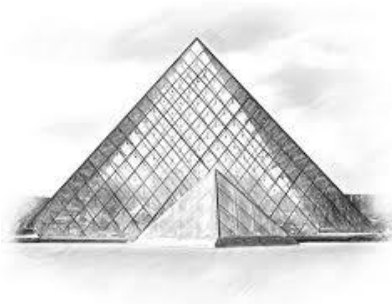
Let's run through these concepts
and how to research for them.

Entities & EAV Model ✨

Entities are distinct and well-defined **concepts**,
such as people, places, things, or ideas.



Barack Obama
Person



The Louvre
Place



smartphone
Thing

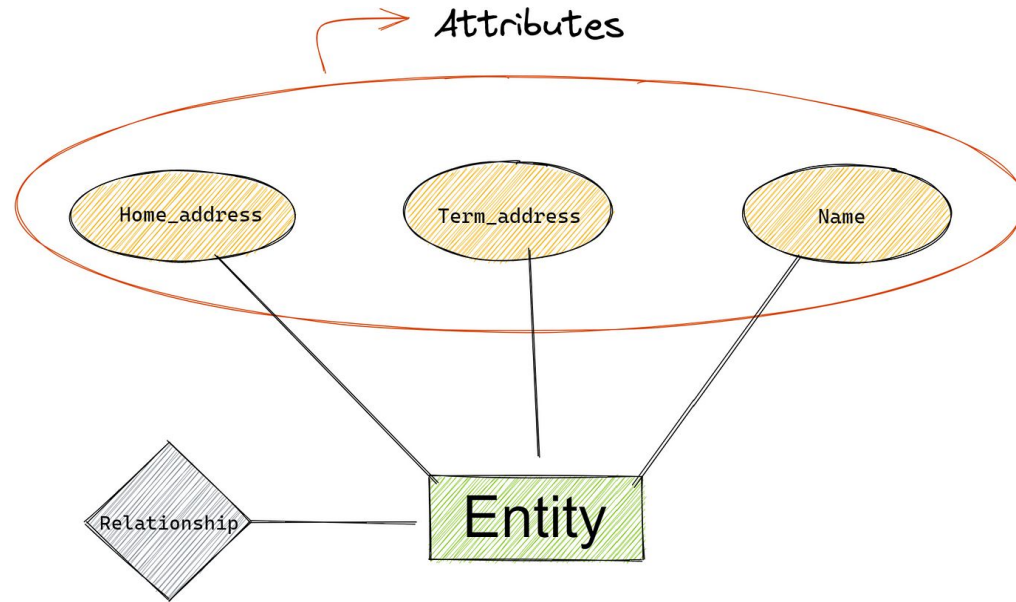
Keywords represent **phrases or specific words** that hold some value from an SEO perspective, while entities reflect **things that exist** in the real world.

Sometimes these two things overlap in the context of
keyword research.
(But not always)

From the context of a user typing a search query into a search engine like Google, the query is composed of keywords of varying importance for SEO, some of which might also be entities.

Search query	Keywords and importance	Entities and type
[Shop online Nike Jordan Air force one]	● <i>Shop</i> — Transactional intent ● <i>Online</i> — Navigate to website or store ● <i>Nike</i> — Branded search ● <i>Jordan air force one</i> — Product search	● <i>Nike</i> — Organization ● <i>Air force one</i> — Product ● <i>(Michael) Jordan</i> — Person

Each entity type has attributes, and each attribute will have different variables



Entity Attributes are characteristics or **properties of entities**.



Dog
Entity



Fur color
Attribute



Breed
Attribute

Entity variables represent the specific values of entity attributes.



Dog
Entity



Breed
Attribute



Labrador
Variable



Husky
Variable

This is important, because...

Understand different ways people refer to concepts.



Barack Obama
"Barack Obama"



Barack Obama
"Former president of United
States"



Barack Obama
"44th U.S. President"

Identify entity **attributes** that people commonly search for and their most popular **variants**, indicating potential content and site structures



When referring to dog food people might often search for specific types like kibble or canned.

In which case for the entity 'dog food', an attribute would be 'food type' with variables 'kibble', 'canned', and so on.

Detect **information gaps** that you can address to
create more comprehensive content



You identify that commonly web content discusses kibble and canned dog food but not raw, semi-moist or chew.



You research and write about these food types, enriching the information landscape and setting your content apart from competitors.

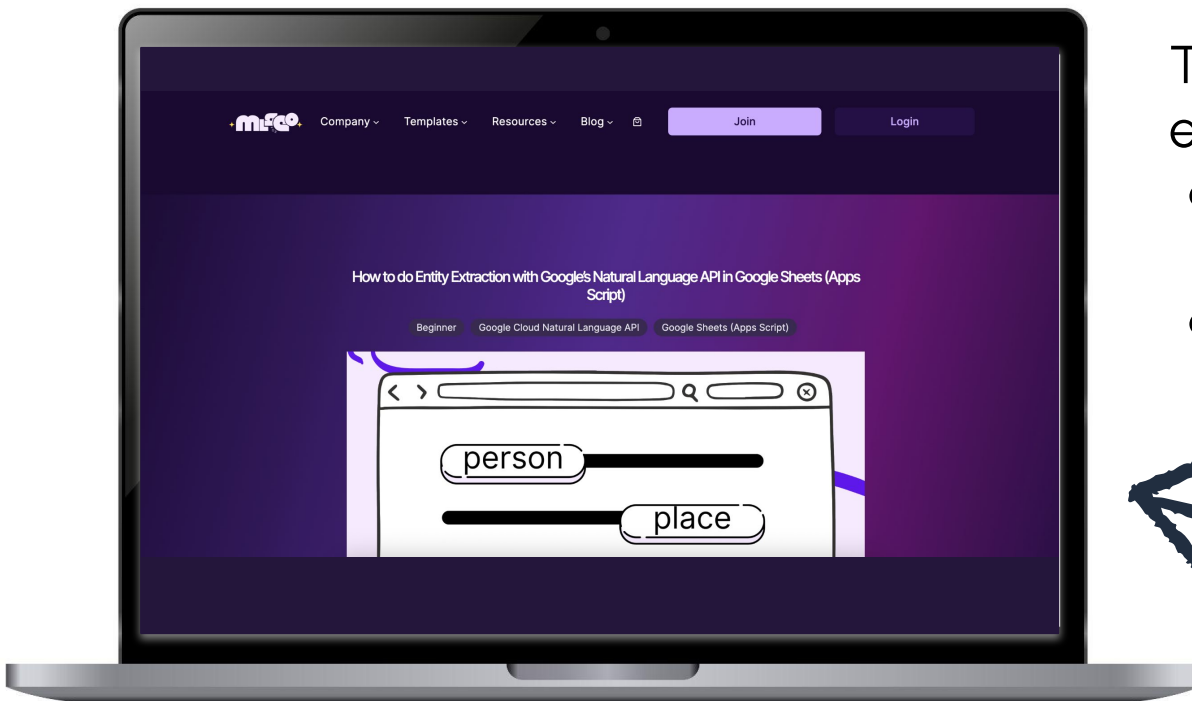
EAV in practice

Step 1. Research the search landscape

Step 2. Compile a database of search terms

Step 3. Extract entities from search terms.





The process of extracting entities:

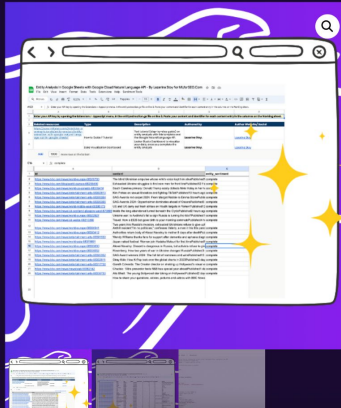
- Takes less than 20 minutes to complete
- Requires no coding skills.



To start extracting entities from your keyword lists with Google's Natural Language API, use [MLforSEO Entity Extraction template in Google Sheets](#) ✨.



Home / Google Sheets Templates / Entity Analysis with with Google Cloud Natural Language API (Google Sheets Template and Apps Script)



Entity Analysis with with Google Cloud Natural Language API (Google Sheets Template and Apps Script)

This Google Sheets template, enhanced with an Apps Script, utilizes the Google Cloud Natural Language API for entity analysis. It enables users to identify and categorize entities within text directly in Google Sheets, streamlining data processing and insight gathering without the need for complex coding. Ideal for extracting names, places, brands, and more from large...

1

Add to cart

Google Cloud CloudNLPproject api X Search

API Credentials + CREATE CREDENTIALS DELETE RESTORE DELETED CREDENTIALS

Create credentials to a

Remember t

API Keys

No API keys to displa

OAuth 2.0 Client IDs

No OAuth clients to display

Service Accounts

No service accounts to display

API key
Identifies your project using a simple API key to check quota and access

OAuth client ID
Requests user consent so your app can access the user's data

Service account
Enables server-to-server, app-level authentication using robot accounts

Help me choose
Asks a few questions to help you decide which type of credential to use

CONFIGURE CONSENT SCREEN

Restrictions

Actions

Creation date ↓

Type

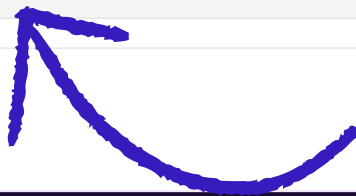
Client ID

Actions

Manage service accounts

Name ↑

Actions



API key

Run the script via
the menu to
extract entities
from content

Copy of Entity Recognition & Entity Sentiment - News

File Edit View Insert Format Data Tools Extensions Help

Sentiment Tools

Mark entities and sentiment

comments	entity_sentiment
The blind Ukrainian amputee whose wife's voice kept him sane	complete
Exhausted Ukraine struggles to find new men for front lines	complete
South Carolina primary: Donald Trump easily defeated	complete
Kim Petras on sexual liberation and fighting TikTok	complete
SAG Awards red carpet 2024: From Margot Robbie to Brad Pitt	complete
SAG Awards 2024: Open nominations ahead of Oscars	complete
US and UK carry out fresh strikes against Houthi targets in Yemen	complete
Inside the long-abandoned tunnel beneath the Clyde	complete
Ukraine war: Is Avdiivka's fall a sign Russia is turning the tide?	complete
Travel: How a £525 bet gave birth to our morning commute	complete
Two years into Russian invasion, exhausted Ukrainians refuse to give up	complete
Authorities return body of Alexei Navalny to mother 8 days after death	complete
Navalny thanks fans for support after dementia and aphasia diagnosis	complete
Japan naked festival: Women join Hadaka Matsuri for first time	complete
Alexei Navalny: Dissent is dangerous in Russia, but activists refuse to give up	complete
Rosenberg: How two years of war in Ukraine changed Russia	complete
SAG Award winners 2024: The full list of nominees and wins	complete
Stray Kids: How K-Pop took over the global charts in 2023	complete
Gareth Edwards: The Creator director on shaking up Hollywood's visual effects	complete
Chuckie: 1Xtra presenter feels R&B has special year ahead	complete
Alia Bhatt: The young Bollywood star taking on Hollywood	complete

Entity Analysis with Google Cloud Natural Language API (Google Sheets Template and Apps Script)

ID	Entity	Type	Salience	Sentiment Score	Sentiment Magnitude	Number of mentions	Metadata	Mentions
1	Entity	Type	Salience	Sentiment Score	Sentiment Magnitude	Number of mentions	Metadata	Mentions
2	https://www.bbc.com/news/world-europe-68376700	Serhiy	PERSON	0.34382942	0	2.6	6	Serhiy, Serhiy, Serhiy, Serhiy, Serhiy, Ser
3	https://www.bbc.com/news/world-europe-68376700	Valeria	PERSON	0.20473818	0	1.9	8	wife, Valeria, Valeria, Valeria, Valeria, Va
4	https://www.bbc.com/news/world-europe-68376700	again.it	OTHER	0.07993547	0	0.3	3	again.it, consciousness, pattern
5	https://www.bbc.com/news/world-europe-68376700	amputee	PERSON	0.03255884	0	1.3	1	amputee
6	https://www.bbc.com/news/world-europe-68376700	men	PERSON	0.023478702	0	0	2	men, men
7	https://www.bbc.com/news/world-europe-68376700	consciousness	OTHER	0.01324304	0	0	1	consciousness
8	https://www.bbc.com/news/world-europe-68376700	legs	OTHER	0.012497222	0	0	1	legs
9	https://www.bbc.com/news/world-europe-68376700	voice	OTHER	0.011640955	0	0	1	voice
10	https://www.bbc.com/news/world-europe-68376700	voice	OTHER	0.011640955	0	0	1	voice
11	https://www.bbc.com/news/world-europe-68376700	wife	PERSON	0.010622509	0	0	1	wife
12	https://www.bbc.com/news/world-europe-68376700	thought	OTHER	0.01018274	0	0	2	thought, relief
13	https://www.bbc.com/news/world-europe-68376700	hospital bed	OTHER	0.009335752	0	0	1	hospital bed
14	https://www.bbc.com/news/world-europe-68376700	BakerBBC NewsAs Serh	OTHER	0.00860053	0	0	1	BakerBBC NewsAs Serhiy
15	https://www.bbc.com/news/world-europe-68376700	Ukrainian	LOCATION	0.007102234	0	0	10	("mid":"m/071211","wikipe Ukrainian, Ukrainian, Ukraine, Ukraine, U
16	https://www.bbc.com/news/world-europe-68376700	soldier	PERSON	0.0063414737	0	0	1	soldier
17	https://www.bbc.com/news/world-europe-68376700	sharingRelated TopicsW	OTHER	0.006290309	0	0	1	sharingRelated TopicsWar
18	https://www.bbc.com/news/world-europe-68376700	Kyiv	LOCATION	0.006290309	0	0	1	("mid":"m/02sn34","wikij Kyiv
19	https://www.bbc.com/news/world-europe-68376700	pageCopy linkAbout	OTHER	0.005526677	0	0	1	pageCopy linkAbout
20	https://www.bbc.com/news/world-europe-68376700	agoShareclose panelSh	OTHER	0.005526677	0	0	1	agoShareclose panelSh
21	https://www.bbc.com/news/world-europe-68376700	UkraineBy Keiligh	OTHER	0.005526677	0	0	1	UkraineBy Keiligh
22	https://www.bbc.com/news/world-europe-68376700	Russia	LOCATION	0.005216035	0	0.2	6	Russia
23	https://www.bbc.com/news/world-europe-68376700	tube	OTHER	0.005082654	0	0	1	tube
24	https://www.bbc.com/news/world-europe-68376700	consciousness	OTHER	0.0050217225	0	0	2	consciousness
25	https://www.bbc.com/news/world-europe-68376700	dreams	OTHER	0.004847212	-0.4	0.8	1	dreams
26	https://www.bbc.com/news/world-europe-68376700	wounds	OTHER	0.004582253	0	0	2	wounds, wounds
27	https://www.bbc.com/news/world-europe-68376700	throat	OTHER	0.004465256	-0.1	0.1	0	throat
28	https://www.bbc.com/news/world-europe-68376700	panic	OTHER	0.004465256	0	0	1	panic
29	https://www.bbc.com/news/world-europe-68376700	darkness	OTHER	0.004465256	0	0	1	darkness
30	https://www.bbc.com/news/world-europe-68376700	organisations	ORGANIZATION	0.004451084	0	0	1	organisation
31	https://www.bbc.com/news/world-europe-68376700	approach	OTHER	0.0041478397	0	0	1	approach
32	https://www.bbc.com/news/world-europe-68376700	veterans	PERSON	0.0039000588	0	0.1	1	veterans
33	https://www.bbc.com/news/world-europe-68376700	Ukrainians	PERSON	0.0031437073	0	0	2	("wikipedia_url":"https://uk Ukrainians, Ukrainians
34	https://www.bbc.com/news/world-europe-68376700	veteransHe	PERSON	0.0030598007	0	0.2	1	veteransHe
35	https://www.bbc.com/news/world-europe-68376700	family	PERSON	0.002669544	0	0	1	family
36	https://www.bbc.com/news/world-europe-68376700	injuries	OTHER	0.0024970311	0	0	1	injuries
37	https://www.bbc.com/news/world-europe-68376700	invasion	EVENT	0.0024199213	0	0	1	invasion
38	https://www.bbc.com/news/world-europe-68376700	consciousness	OTHER	0.0023867677	-0.3	0.3	1	consciousness
39	https://www.bbc.com/news/world-europe-68376700	soldier	PERSON	0.0023730078	0	0	1	soldier

Get entity data in seconds

EAV in practice

Step 1. Research the search landscape

Step 2. Compile a database of search terms

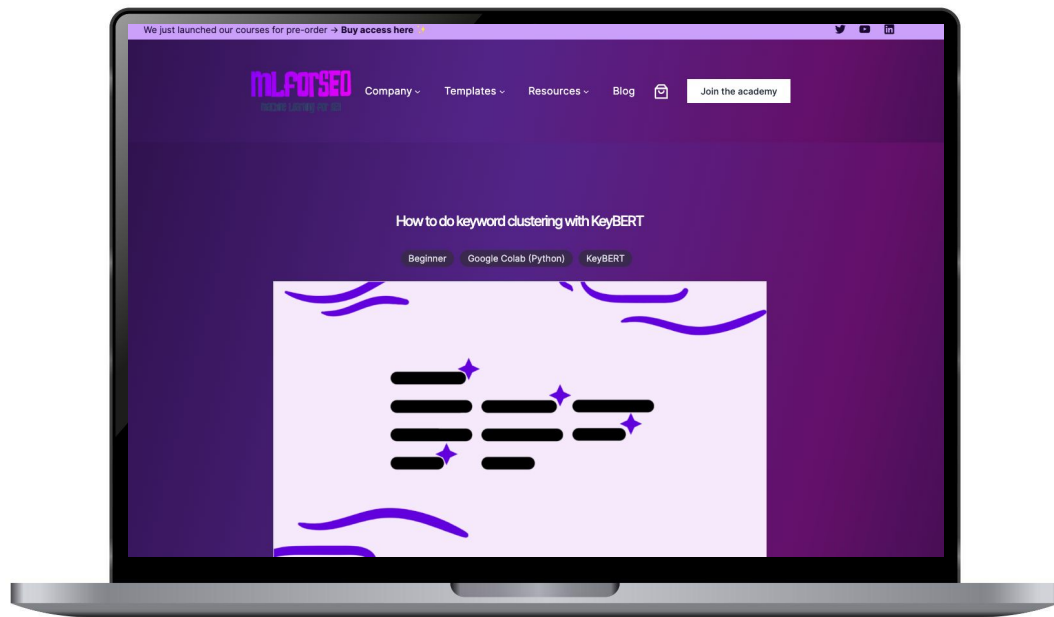
Step 3. Extract entities from search terms.

Step 4. Identify co-occurring terms for the entities



You can do this programmatically via applying an n-grams custom formula.

You can also do this with KeyBERT to identify the most important **semantically** terms or term combinations (keyword extraction and clustering).



	A	B	C
1	Keywords		
1670	sustainable energy articles		
1671	sustainable energy business		
1672	sustainable energy business ideas		
1673	sustainable energy companies to invest in		
1674	sustainable energy finance		
1675	sustainable energy futures		
1676	sustainable energy ideas		
1677	sustainable energy industry		
1678	sustainable energy investment funds		
1679	sustainable energy investment funds		
1680	sustainable energy production ideas		
1681	sustainable energy products		
1682	sustainable energy sector		
1683	sustainable engineering projects		
1684	sustainable esg investing		
1685	sustainable fashion business		
1686	sustainable fashion business ideas		
1687	sustainable fashion business plan		
1688	sustainable finance and investment		
1689	sustainable finance podcast		
1690	sustainable financial investments		
1691	sustainable food business		

A	B	C
Keywords	Core (1-gram)	Core (2-gram)
sustainable energy articles	sustainable	sustainable energy
sustainable energy business	sustainable	energy business
sustainable energy business ideas	sustainable	energy business
sustainable energy companies to invest in	sustainable	energy companies
sustainable energy finance	sustainable	energy finance
sustainable energy futures	sustainable	energy futures
sustainable energy ideas	sustainable	sustainable energy
sustainable energy industry	sustainable	sustainable energy
sustainable energy investment funds	investment	energy investment
sustainable energy investment funds	investment	energy investment
sustainable energy production ideas	sustainable	sustainable energy
sustainable energy products	sustainable	sustainable energy
sustainable energy sector	sustainable	sustainable energy
sustainable engineering projects	sustainable	sustainable engineering
sustainable esg investing	esg	esg investing
sustainable fashion business	fashion	sustainable fashion
sustainable fashion business ideas	fashion	sustainable fashion
sustainable fashion business plan	fashion	sustainable fashion
sustainable finance and investment	investment	sustainable finance
sustainable finance podcast	podcast	finance podcast
sustainable financial investments	investments	sustainable financial
sustainable food business	sustainable	sustainable food

The key here is to analyze bigrams (pairs of words) or trigrams (triplets), uncovering the most prevalent keyword combinations of **n-grams + entities**.



single-variant

best dog food for {dog breed}

best {type of dog food} dog food

best dog food for {intended outcome}

multi-variant

best {type of dog food} dog food for {dog breed}

best dog food for {dog breed} for {intended outcome}

EAV in practice

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Step 5. Create a list of all the patterns of entity-related terms.



Identifying query EAV patterns can be super useful for starting to think about **templated content** and **content patterns**.

Entity	Attribute	Variable
Dog Food	Dog Breed	• Labrador • Poodle • French Bulldog • American Bulldog • Golden Retriever • Hound • Italian Hound • ...

Entity	Attribute	Variable
Dog Food	Food Type	• kibble • canned • raw • homemade • grain-free • chew • semi-moist • dehydrated • ...

Entity	Attribute	Variable
Dog Food	Dog Need	● weight gain ● weight loss ● sensitive skin ● sensitive stomach ● diabetes ● protein need ● digestive problems ● shiny coat ● ...

entity: 1



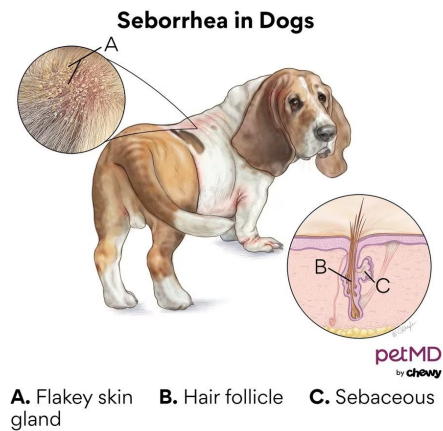
breed: 356



food type: 8



dog need: 8



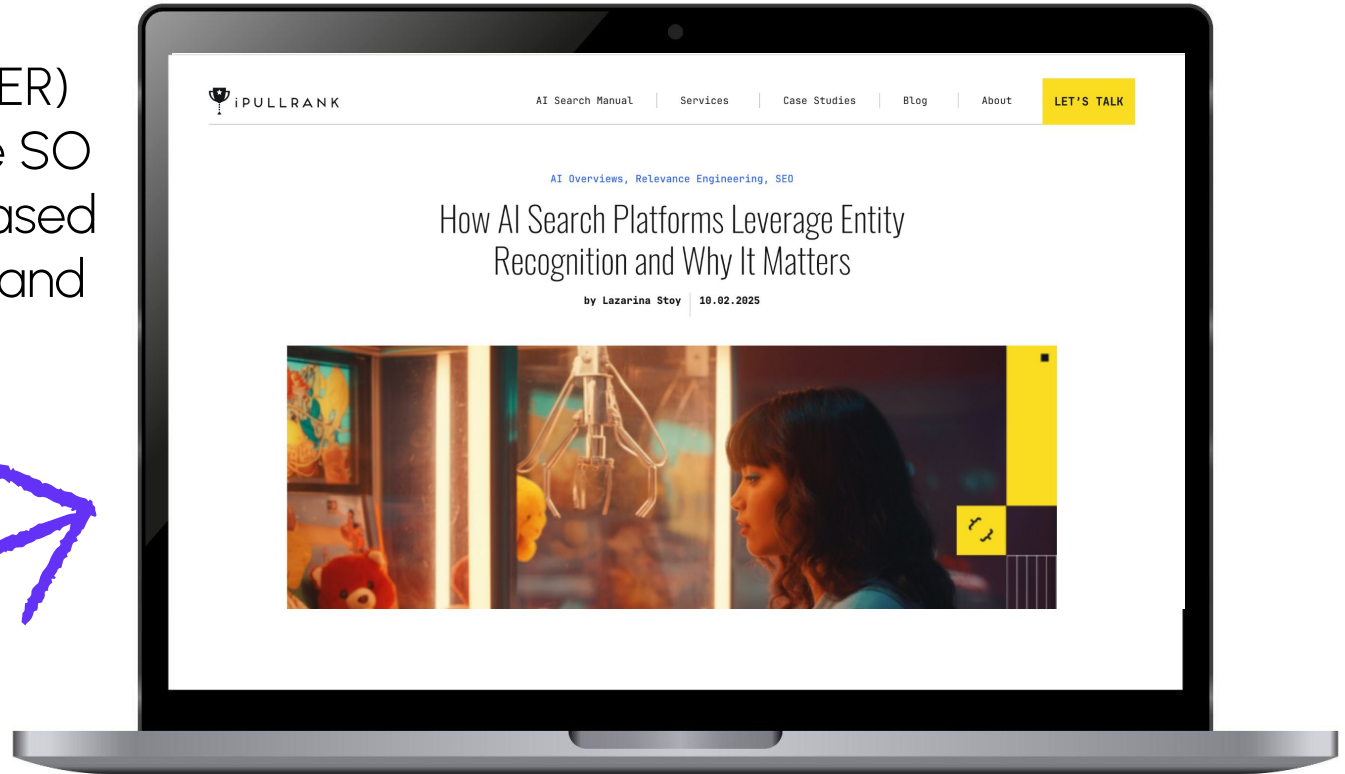
A. Flakey skin gland B. Hair follicle C. Sebaceous gland

You can **programmatically map out all entity-attribute-variables combinations** into your final target queries.



This will allow you to **discover terms that might be niche (yet relevant)** and/or not included into your keyword exports to enhance your content with.

Entity recognition (NER)
and Entity Linking are SO
important for LLM-based
information retrieval and
AI search, too



Used at almost every
stage of AI search /
LLM-based search
systems



Stage	Role of Entity Identification	Role of NER (parsing and intent)	Role of Knowledge Graphs (KG)	Role of Entity linking (canonical IDs)	Outputs/artifacts
Understanding and Expanding Queries	Detect entities in the user query.	Identify topics/subjects/aspects and form a query/context embedding ('current context vector').	Use entity relationships and topical proximity to drive query fan-out and generate synthetic queries (leveraging prior/implied queries).	Crosswalk references to broader/narrower equivalents (e.g., 'SUV' → 'Model Y', 'ID.4'); normalise synonyms/aliases.	Expanded query set ; synthetic queries list ; context embedding ; initial entity slate (candidate IDs).
Contextualisation and Personalisation	Recognise entities in signals (prior queries, location, device, behaviour).	Build a persistent user-state embedding ; infer intent; suppress content already known.	Map user attributes/interests to nearby KG clusters for personalised expansion/boosting.	Tie user signals to stable IDs (home city, owned products) for consistent personalisation.	User-context embedding/profile ; personalisation boosts/filters ; optional known-content suppression list .
Document Retrieval and Synthesis (RAG)	Find entity mentions in docs/passages to form a custom corpus .	Do passage-level matching; embed queries/subqueries/docs/passages; select passages that support reasoning steps ; route to downstream LLMs by query class.	Bias retrieval with type constraints and KG proximity ; ensure content is entity-rich/KG-aligned .	Normalise variant names so the same entity is retrieved despite surface differences.	Candidate corpus (dense+sparse); passage embeddings and scores ; retrieval logs ; LLM routing decision .
Query Parsing and Intent Classification	Surface ambiguous entities (e.g., 'Jordan').	Resolve intent via entity typing (person/brand/country) to stabilise meaning early.	Provide type/ontology signals to guide vertical routing.	Commit the resolved mention to the correct canonical ID for downstream use.	Intent class/labels ; entity-type tags ; target entity ID ; routing flags .
Expansion and Disambiguation	-	Expand aspect terms where implied (features, product lines).	Use KG relations and IDs to broaden/narrow beyond literal	Map synonyms/aliases/brand nicknames to one ID to	Expansion set (broader/narrower terms); canonicalisation map
			wording.	avoid variant misses.	(surface → ID); narrowing constraints .
Retrieval Constraints	Ensure target entity/type appears in candidates.	Filter out off-aspect passages.	Enforce hard/soft filters by entity type and specific IDs (e.g., GTIN/MPN/catalog IDs).	Admit only passages that resolve to the target ID ; exclude the rest.	Eligibility mask over candidates; ID/type filter set ; whitelist/blacklist by ID (where supported).

Query Sequences and Query paths ✨

Search engines receive massive quantities of data to
understand how people search, at **scale**.



They collect and process data for:

- how users refine their searches,
- the progression of their queries,
- the number of queries they conduct before settling on a result, and
- how their search behavior evolves during a session.

The aim here is to grasp the **relationships between queries** (proximity and path to result), and **sequences of queries** performed in a single session, and use this information to enhance the content you produce.



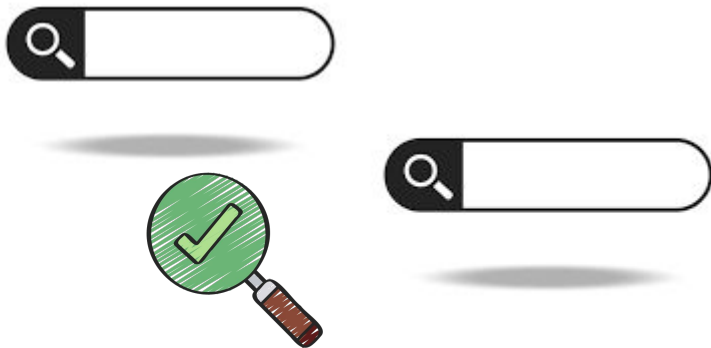
Each search you perform sends data to Google.



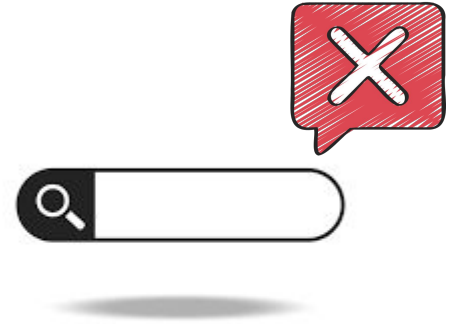
If you do multiple searches in a session, Google will analyse the semantic proximity of these searches to one another.



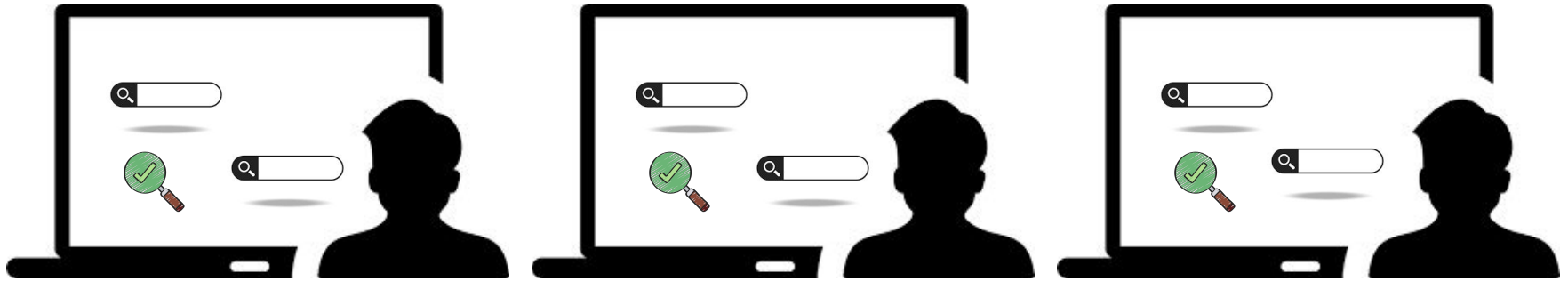
If the searches are found to be related to one another semantically, structurally, or thematically, they identify this.



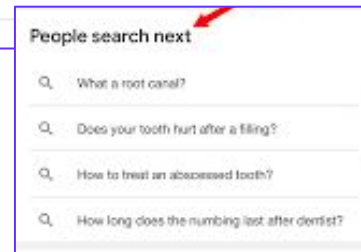
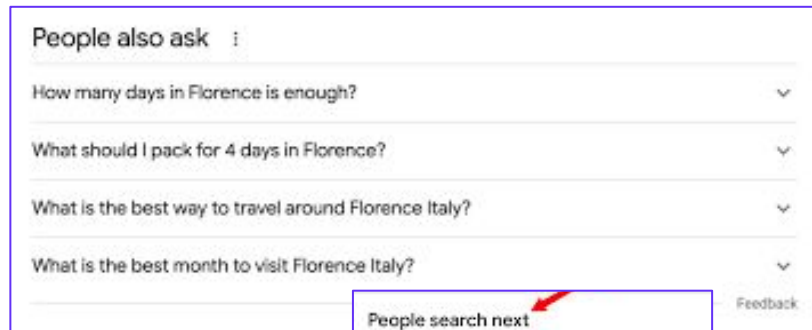
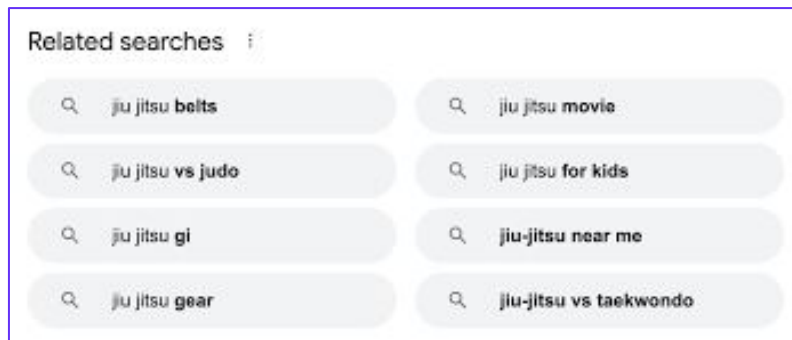
Semantically-close queries, and queries that are related to one or more previously entered queries, are placed into an “established sequence.”



If the query term appears unrelated, the search engine may start a new sequence.



If Google detects patterns - a lot of people performing this same query sequence a search session, they will use this to further tie the two phrases as semantically-related, and use this information to use it to enrich the SERP.



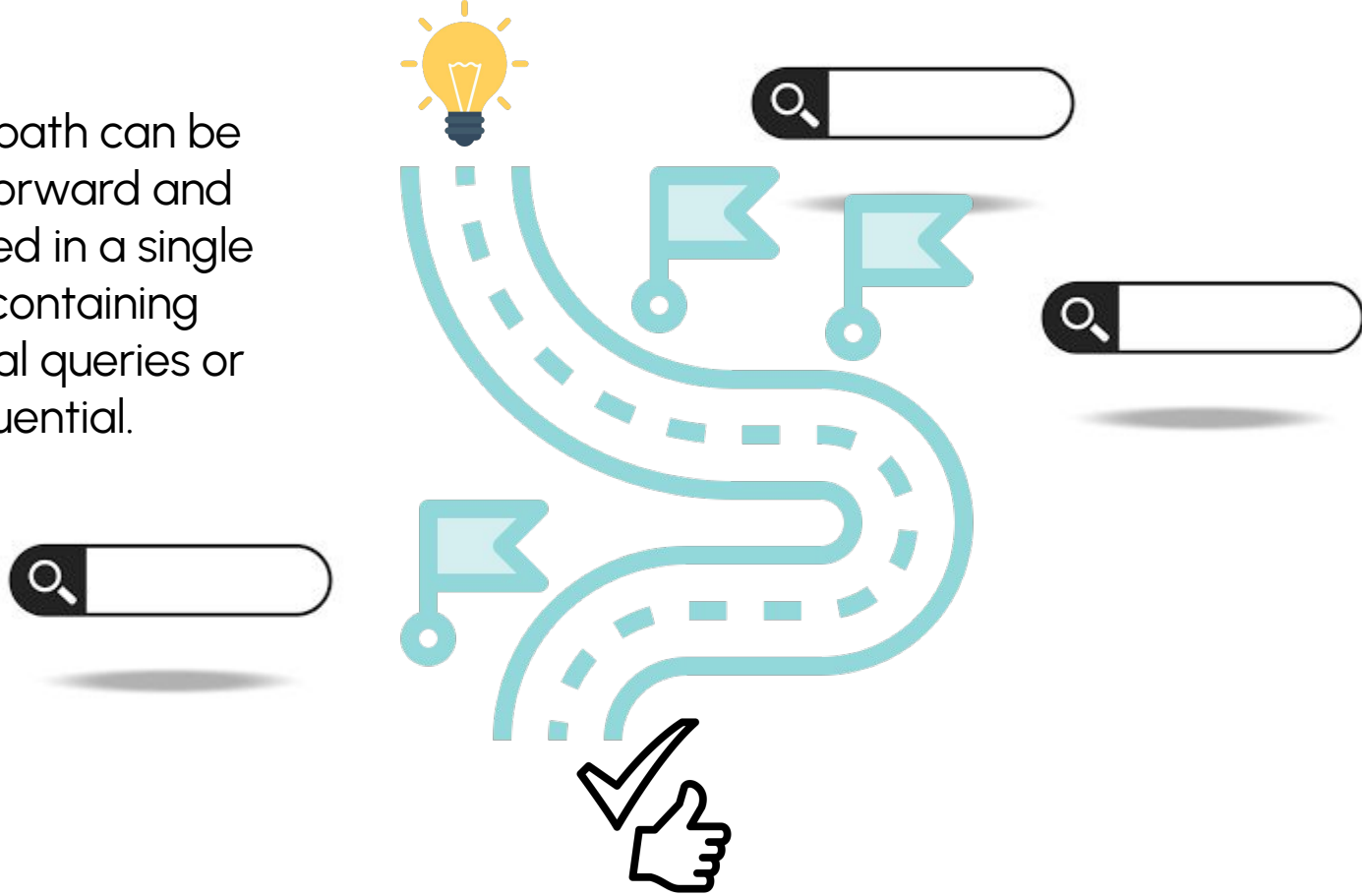
They might introduce SERP features like [Related searches](#), [People Also Ask](#), [People Also Search For](#), [People Search Next](#), as these indicate queries that are semantically related not only in terms of topic and intent, but also in terms of session context.

The **query sequence** is the series or order of different search queries, through which a searcher performs a search session on a search engine.

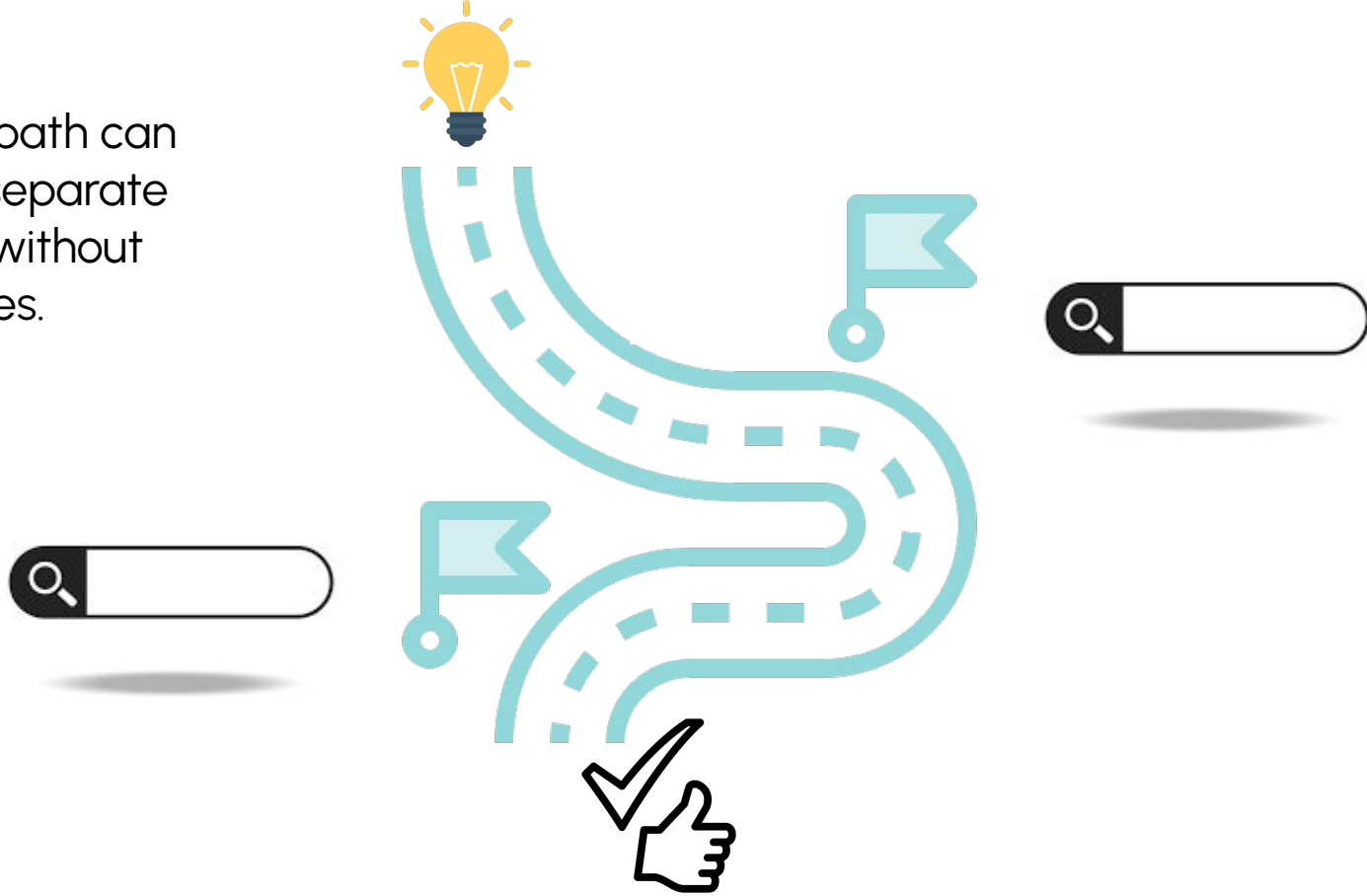
A query is a component of a query sequence.

Queries and query sequences can be components of a query path.

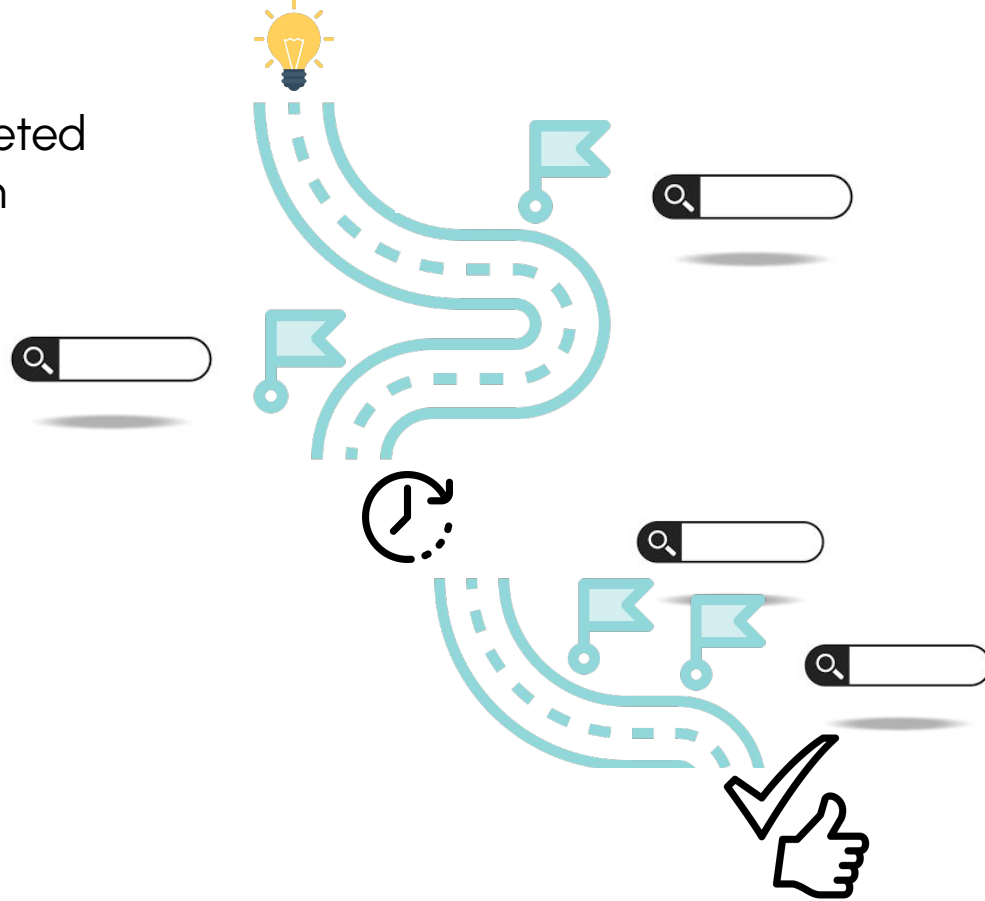
A query path can be straightforward and completed in a single session, containing sequential queries or non-sequential.



A query path can contain separate queries, without sequences.



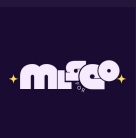
It could be completed
in different search
sessions.



The **query path** is comprised of different search queries or query sequences that a searcher performs until they reach a point of interest or exhaust on a given topic (until they satisfy their intent) in a single search session or across multiple sessions.

Query paths are:

- Dependent on location → this can influence results shown
- Dependent on query semantics -> this can narrow or expand the results shown
- Dependent on user demographics and previous knowledge → this determines search patterns
- Dependent on user content preference → Highly subjective
- Dependent on past user history and session context → this determines results shown and influence search behaviour



Researching these in practice

One Approach: Use fuzzy matching to calculate query distance

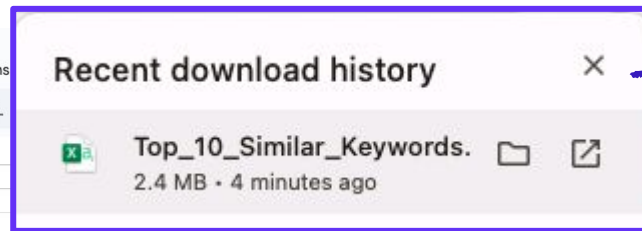
Keyword Universe - Sample

File Edit View Insert Format Data Tools Extensions

Q Menus 100%

A1:A6199 Keyword

1	Keyword
2	home gym equipment
3	best home gym equipment
4	at home gym equipment
5	home gym equipment for sale
6	best home gym equipment 2021
7	best at home gym equipment
8	all in one home gym equipment
9	home gym equipment near me
10	home gym must have equipment
11	used home gym equipment for sale
12	cheap home gym equipment
13	home gym equipment all in one
14	fitness equipment for home gym
15	must have gym equipment at home
16	home gym all in one equipment
17	must have equipment for home gym
18	must have gym equipment for home
19	in home gym equipment
20	gym equipment for home
21	basic home gym equipment
22	essential home gym equipment
23	home gym basic equipment
24	basic gym equipment for home
25	basic equipment for home gym
26	best equipment for home gym
27	small home gym equipment
28	used home gym equipment for sale

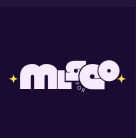


Keyword	Top Similar Keywords
must have gym equipment at home	storing gym equipment at home, 77% best gym equipment at home, 77% hire gym equipment at home, 77% must have gym equipment for a home gym, 76%
home gym all in one equipment	home gym lifting equipment, 76% home gym climbing equipment, 76% home gym beginner equipment, 76% home gym list of equipment, 76% home gym cardio equipment, 72% home gym cable equipment, 72% home gym resistance equipment, 72% home gym boxing equipment, 72% home gym all in one machine, 72% home gym back workout equipment, 71%
must have equipment for home gym	must have equipment for a home gym, 94% must have equipment in home gym, 91% must have gym equipment for home gym, 89% best ab equipment for home gym, 84% must have gym equipment for a home gym, 84% must have equipment for home gym reddit, 82% best small equipment for home gym, 82% best basic equipment for home gym, 82% best rogue equipment for home gym, 82% best cheap equipment for home gym, 82%
	must have gym equipment at home, 91% must have gym equipment for home gym, 89% multi use gym equipment for home, 84% must have gym equipment for a home gym, 84% best home gym equipment for women, 82% best basic gym equipment for home, 82% best cheap gym equipment for home, 82% multi gym equipment for home, 81% 2nd hand gym equipment for home, 81%

Having terms that are similar, doesn't mean they are necessarily sequential or part of a single path.
(but they might be... analyze!)

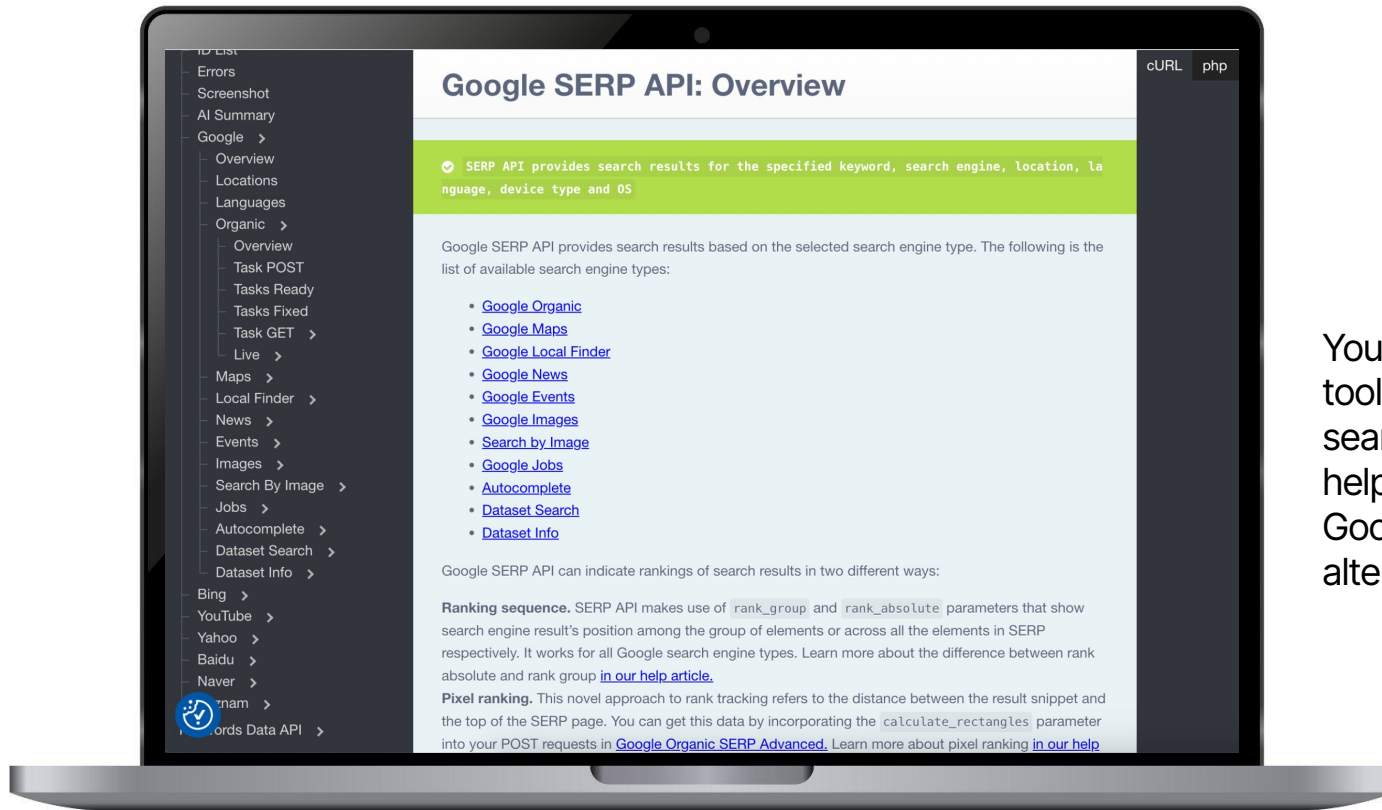
Do this for:

- Your ranked keywords
- Internal site searches
- Competitors' ranked keywords
- Keyword universe (opportunity) terms



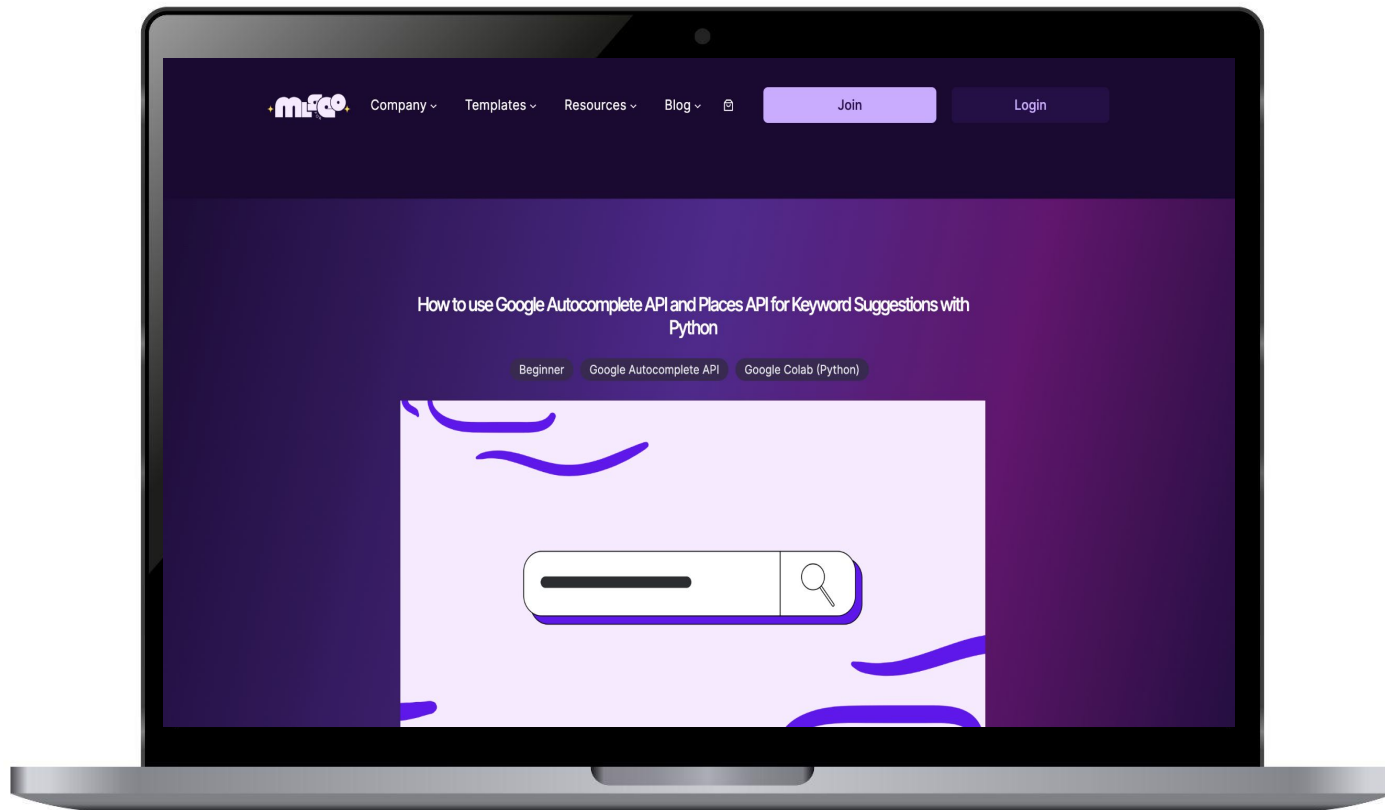
Another approach: Reverse-engineer - do SERP analysis on your keywords list to identify where Google shows sequential SERP features, and utilise Autocomplete for research.

Scrape data from the Google SERP for a large collection of important keywords, specifically the look for SERP features like [Related Searches](#), [People Also Ask](#), [People Also Search For](#), [People Search Next](#), as these indicate queries that are semantically related in terms of topic, intent, and session context.



You can do this manually, or via a tool like Semrush for individual searches, while DataforSEO can help you do it at scale (both in Google Sheets for no-code alternative, but with an API, too).

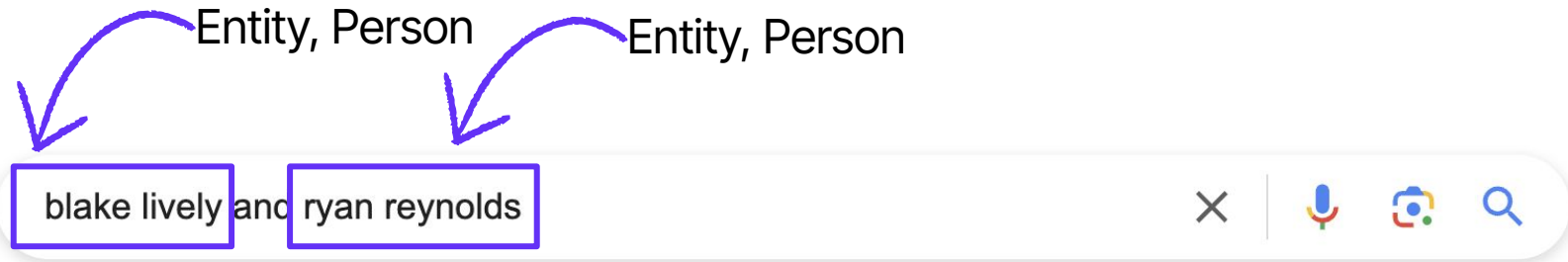
Run important keywords for your business through **Google Autocomplete** to see the searches that Google is recommending to users (related to their original search).



Users, search engines, and (now) agents
also **augment** search queries.
(or create entirely new, **synthetic** queries)

Augmented search queries are queries, in which the user or the search engine **incorporates additional information** derived from entity references within a query.

Augmentation Queries are either **user-generated** or **synthetic** (machine-generated).



The search results would recognise the entity references in the query, and suggest augmentations to the query to introduce new information to the user.

blake lively and ryan reynolds



All

Images

News

Videos

Books

Finance

Web

Tools

Movie

Kids

Relationship

Marriage

Funny

Wedding

Age

Trolls

Like movies they starred in together, or whether they have kids.

Google can then generate **additional queries** based on these **entities** and their **attributes**, integrating the results with the original search query outcomes.

User-initiated queries are simply put: searches, triggered by a human action.

Synthetic queries are information requests, issued by software. They are rarely coordinated by a human but can sometimes be supervised or observed by the user.



Synthetic queries
can be simple,
traditional

- Query rewrites / reformulations (e.g. web search, voice search)
- Autocomplete/Autosuggest
- Hover/click prefetch
- Batch query tracking

Synthetic queries can
also be complex,
orchestrated,
AI-driven

- Prompt rewriting / decomposing
- Query Fan-out
- Deep Research
- Grounding
- Agentic workflows

Researching for **augmented queries** in practice

Step 1. Do **synthetic query fan-outs** for your keyword universe to uncover new angles and different persona profiles

Step 2. Ensure that your content clearly **identifies** and **references significant entities** relevant to your topic.

Step 3. Understand how different entities can be logically combined with one another in searches.



Kamala Harris (Person)

Her Husband



Douglas Emhoff (Person)

For instance, the entity Kamala Harris (Person) might be logically combined with Douglas Emhoff (Her Husband; Person).



Kamala Harris (Person)

Candidate for



2024 US elections :

'2024 US elections' (Event)

It might also be combined with '2024 US elections' (Event),
where she is a candidate.



Kamala Harris (Person)

Born in



Oakland
City in California



See more →

Oakland, California (Place)

It might also be combined with Oakland, California (Place),
where she was born.

Researching queries and later writing like this (i.e. via **entity linking**) helps with knowledge graph enhancing, too

How are new facts (tuples) added to the Knowledge Graph?

When the KG lacks information about entities, Google uses:

- **Inverse Tuples (i.e. fact flipping to find new facts):** Google also flips facts to find new ones. For instance, if "Planet of the Apes was released in 2001," the inverse fact could be "2001 is the release year of Planet of the Apes."
- **Merging Data (expansion when new facts are confirmed):** When Google finds new, reliable information, it merges it into the Knowledge Graph to fill in gaps and add details.

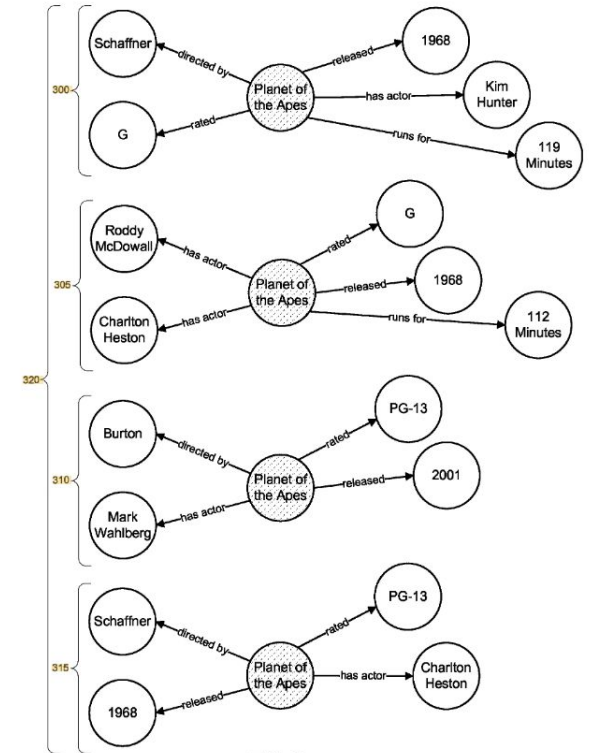
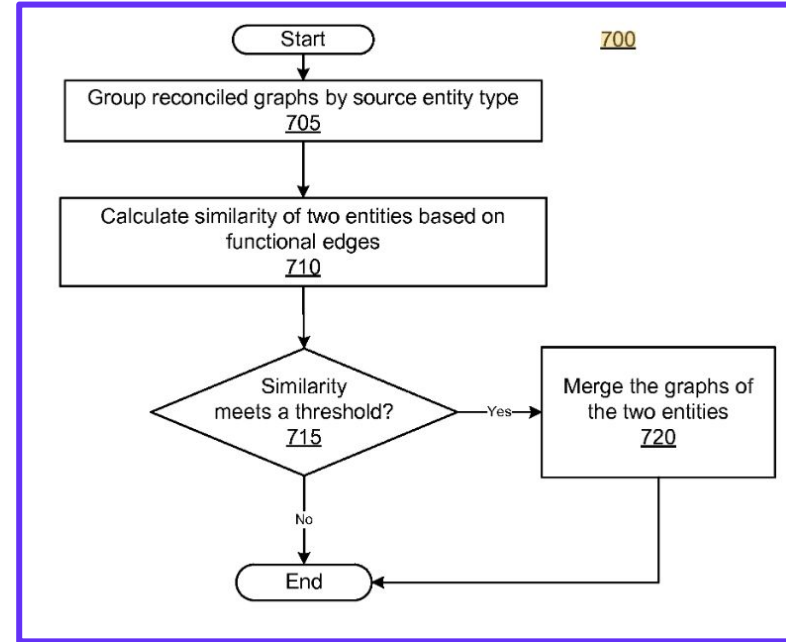


FIG. 3

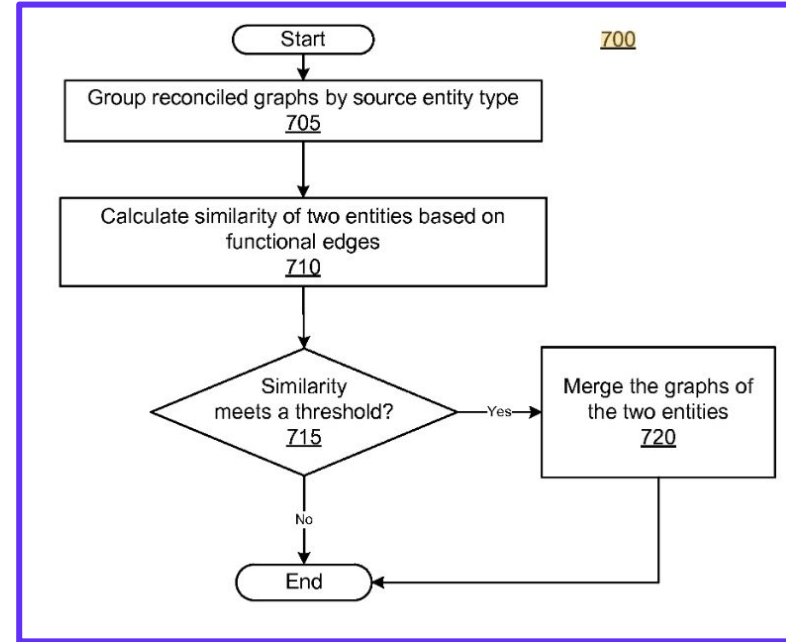
How does Google find missing information?

- **First Clustering:** Google looks at data from different sources and groups similar pieces of information, then on that corpus decides the facts about an entity. The system may cluster the potential tuples by: source, provenance, subject entity type, subject entity name
- **Then Buckets:** Within these clusters, Google uses already familiar facts ("key facts"; e.g. "Maryland is in the USA") to further organize the data and distinguish different mentioned entities (e.g. Maryland the state vs. Maryland the university).



How does Google find missing information?

- **First Clustering:** Google looks at data from different sources and groups similar pieces of information, then on that corpus decides the facts about an entity. The system may cluster the potential tuples by: source, provenance, subject entity type, subject entity name
- **Or questions to the corpus, web or other databases, or user interactions:** To address these gaps, Google generates specific queries aimed at retrieving the missing information. By processing these queries, Google gathers relevant data to update and enrich the Knowledge Graph.



Step 4. Understand and incorporate **thematic searches**.



Query context & Session Context ✨

For example, if a user asks Google something along the lines of [What's the capital of France?]

The image is a screenshot of a Google search interface. At the top, a purple rectangular box highlights the Google logo and the search bar, which contains the text "capital of france". Below the search bar are navigation tabs for "All", "Images", "Videos", "News", "Books", and "More", along with a "Tools" link. The search results page for "Paris" is displayed. It includes a description of Paris as the capital and most populous city of France, situated on the Seine River. Below this, there is a link to "The Council of Europe" and a link to "Paris, France - Intercultural cities programme". A section titled "People also search for" shows suggestions for "France", "London", and "Eiffel Tower". Another section titled "People also ask" lists four questions: "What is France capital?", "What are the two capitals of France?", "What are the old capitals of France?", and "When did Paris become the capital?". To the right of the text, there are two images of the Eiffel Tower and a map of Paris. The map shows the city's location relative to surrounding areas like Nanterre, Boulogne-Billancourt, and Versailles. Below the map, the text "Paris" and "Capital of France" is displayed, followed by a brief description of Paris as a major European city and a global center for art, fashion, gastronomy, and culture.

Then, they follow up
with [popular tourist
attractions]

The screenshot shows a Google search for "popular attractions". The search bar is highlighted with a red box. Below the search bar, there are tabs for "All", "Images", "Videos", "News", "Books", and "More". To the right of these tabs is a "Tools" link. Below the tabs, there are filters for "In USA", "In the world", "Top 10", "In Canada", "In Japan", "In New York", "Open now", and "In Singapore". A toggle for "SEOquake" is visible on the left. The search results show a sponsored section for "Tickets & tours" with five cards for travel packages in Sofia, Bulgaria. Below this is a section titled "Popular tourist attractions" with a subtitle "From sources across the web". This section displays a grid of nine popular tourist attractions, each with a thumbnail image and a dropdown arrow. The attractions listed are: Eiffel Tower, Colosseum, Acropolis of Athens, Angkor Wat, Burj Khalifa, Gardens by the Bay, Great Pyramid of Giza, Central Park, and Sagrada Familia. At the bottom of the grid, there is a "15 more" link and a "Feedback" link. The footer of the page shows the "U.S. News Travel" logo and a URL: "https://travel.usnews.com/Advice/".

Google

popular attractions

All Images Videos News Books More Tools

SEOquake

In USA In the world Top 10 In Canada In Japan In New York Open now In Singapore

This search may be relevant to recent activity: popular attractions *in france* Your Search activity Feedback

Sponsored - Tickets & tours

Saeva Dupka, Develashka a... BGN 166 GetYourGuide 5.0 ★ (26)

Sofia's Hidden Bars: 4-Hour... BGN 35 GetYourGuide 4.6 ★ (416)

Exploring Sofia's Garden... BGN 506 GetYourGuide Free cancellati...

From Sofia: Zlatna Panega... BGN 174 GetYourGuide 5.0 ★ (2)

From Sofia: Belogradchik... BGN 135 GetYourGuide 4.8 ★ (177)

Popular tourist attractions

From sources across the web

Eiffel Tower

Colosseum

Acropolis of Athens

Angkor Wat

Burj Khalifa

Gardens by the Bay

Great Pyramid of Giza

Central Park

Sagrada Familia

15 more

Feedback

U.S. News Travel

https://travel.usnews.com/Advice/



All Images Videos News Books More

Tools

In USA

In the world

Top 10

In Canada

In Japan

In New York

Open now

In Singapore

SEOquake

This search may be relevant to recent activity: popular attractions *in france*

Your Search activity Feedback

Sponsored · Tickets & tours



Saeva Dupka,
Devetashka a...
BGN 166
GetYourGuide
5.0 ★ (26)



Sofia's Hidden
Bars: 4-Hour...
BGN 35
GetYourGuide
4.6 ★ (416)



Exploring Sofia's
Garden...
BGN 506
GetYourGuide
Free cancellati...



From Sofia:
Zlatna Panega...
BGN 174
GetYourGuide
5.0 ★ (2)



From Sofia:
Belogradchik...
BGN 135
GetYourGuide
4.8 ★ (177)

Popular tourist attractions

From sources across the web



Eiffel Tower



Colosseum



Acropolis of Athens



Angkor Wat



Burj Khalifa



Gardens by the Bay



Great Pyramid of Giza



Central Park



Sagrada Familia

15 more

Feedback



U.S. News Travel

Even though the second query does not contain the query context (i.e., in France), Google automatically applies some **query refinement** and incorporates the query context in the search results to better address the searcher's intent.

Query context is the context that the user provides in individual queries via the words provided as part of the query.

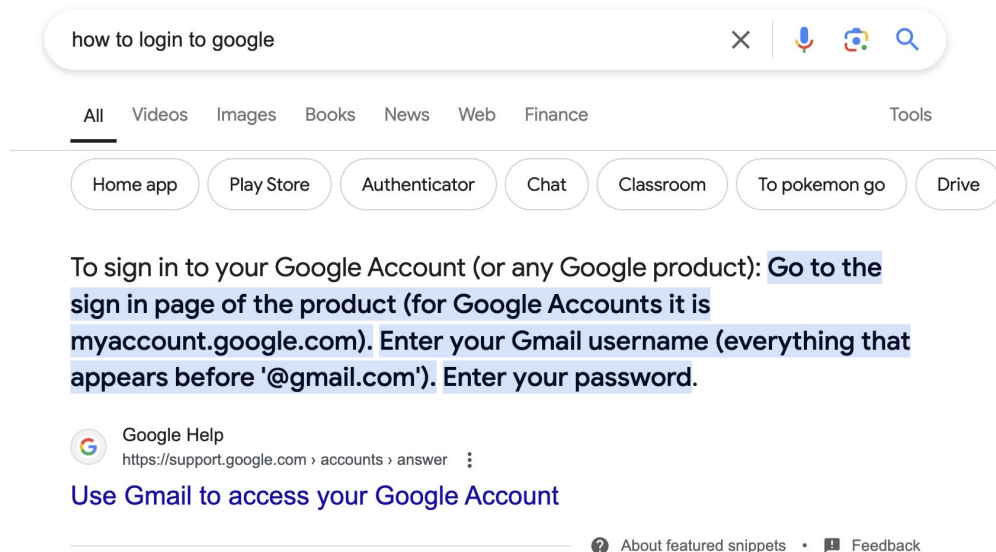
Session context is context provided **indirectly by the user** like the sequence of queries, the frequency of searches on the topic, the users' location, and other factors that the search engine considers.

In practice

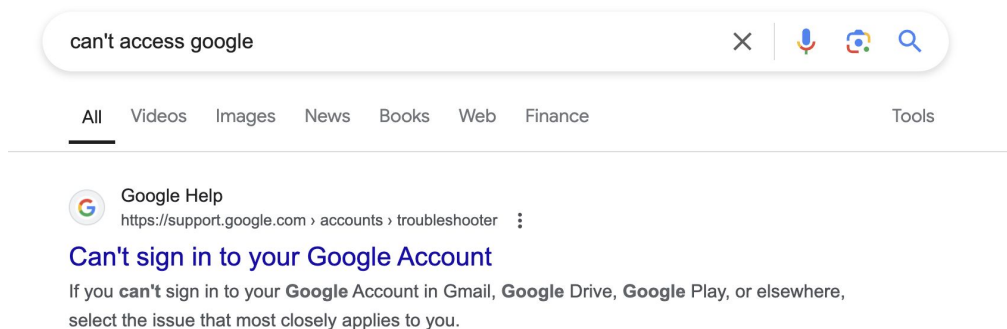
One approach: Identify semantically-related, co-occurring queries, in your users' search sessions and plan for content revisions

Especially if you have similar types of pages, like tutorials or guides, researching the query patterns on how these are found by users can help you adjust the on-page content to better reflect the search patterns of users.

For instance, a tutorial might be ranking for a query containing the term 'how to' + the task



...but it might also rank for a query containing the term 'can't' + desired action.

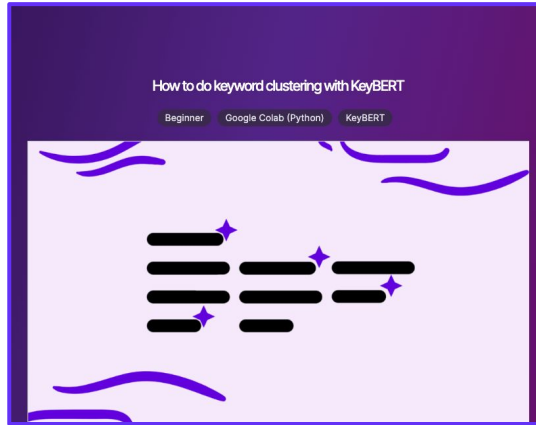


SERP features like Google's "People Also Ask" and "Related Searches" sections, along with keyword research tools, can help identify variations and refinements in search terms.



Analyze these to understand common follow-up searches that users make within the same session, as these often reveal nuanced intent.

Group keywords into themes
based on their broader
meanings.



This helps in understanding
high-level categories and user
intent around those topics,
which is crucial for planning
targeted content

Google also uses **contextual signals** from the user and their behaviour to personalize results.

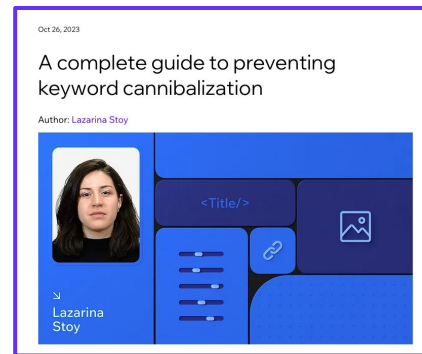
...and they also personalise based on **past interactions** and **content preferences**.

Previously seen items by the user:

If a search result has been previously seen by the user in a similar search, its rank is lowered to avoid showing the user results they've already encountered and potentially found unhelpful.

Prolonged
cannibalisation between
articles on your own
website leading to
drops?

- Identify content on your own website that ranks for similar keywords
- Identify content that is positive as a potentially intent cannibalising article, and has dropped in ranking
- Pull for revisits or consolidation



Items from prior queries by the same user:

If a user previously viewed certain items during a similar search session, these items may be ranked lower to prioritize new results, assuming that repeat items might not be as useful.



Your articles may be re-ranked as your target has seen them already and didn't choose them

- Identify content on your own website that ranks for similar keywords as the content of your competitors
- Identify content from this subset that has significantly dropped in ranking
- Pull for revisits or consolidation

Frequently viewed items in similar queries by other users:

When other users with similar searches frequently view certain items, those items are boosted in rank for the current user, as they may be of interest based on broader search trends.



Identify semantically similar queries of competing website to your own

- Analyse your competitors' (business and organic) ranked queries for semantics
- Identify the content that is frequently viewed in similar queries, and compare and contrast this to your own content
- Optimize and update these high-interest pages to maintain relevance, ensuring they continue to capture user interest over time.
- Link to these frequently viewed pages across related content and blog posts, helping users discover popular, relevant information within their search context.

Search Intent

Aspect	Macro Search Intent	Micro Search Intent
Definition	Broad categories of user objectives, such as informational, navigational, transactional, and commercial.	Specific, nuanced user needs within broader categories, reflecting particular contexts or preferences.
Scope	Generalized understanding of user goals.	Detailed insights into specific user motivations and contexts.
Examples	- Informational: Seeking general information. - Navigational: Looking for a specific website. - Transactional: Intending to make a purchase. - Commercial: Researching products or services.	- Informational Micro Intent: Searching for a specific tutorial. - Navigational Micro Intent: Looking for a particular page within a website. - Transactional Micro Intent: Seeking a specific product model to buy. - Commercial Micro Intent: Comparing features of two specific products.
Content Strategy	Develop broad content that addresses general user intents.	Create targeted content that caters to specific user queries and contexts, enhancing relevance.
SEO Approach	Optimize for high-level keywords representing broad intents.	Focus on long-tail keywords and specific phrases that capture detailed user intents.

For example, **transactional intent** can look differently for different industries

Ecommerce	SaaS	Services
Buy price purchase pricing cheap expensive recommendation recommended near me firm coupon order	Price pricing plans features alternative support signup demo request trial free trial License product key API key	call book contact reach find services what we do work portfolio solutions Pricing demo testimonials consultancy operations

For example, **transactional intent** can look differently for different personas

Affluent	Cheapskate	Innovator
Traits: Values premium quality, luxury, exclusivity. Example Queries: • "Best luxury watches to buy 2024" • "Exclusive high-end furniture for home office" • "Where to order gourmet meal delivery service" • "Custom-tailored suits near me" • "Private jet rental costs for business trips"	Traits: Highly budget-conscious, seeks discounts, bargains, and free options. Example Queries: • "Best deals on refurbished laptops under \$300" • "Coupons for grocery delivery services" • "Cheap second-hand furniture online" • "Buy affordable gym equipment on sale" • "Free shipping on budget smartphones"	Traits: Early adopter, technology enthusiast, values cutting-edge products and experiences. Example Queries: • "Preorder the latest VR headset 2024" • "Where to buy smart home devices with AI integration" • "New electric car models with advanced features" • "Top crowdfunding tech gadgets to invest in" • "Best wearables with health tracking sensors"

Type 1: Based on the **User's Query**

Field	What it does	Formula Used
Main Intent Category	<i>Broad purpose of the query: Informational, Navigational, Transactional, or Commercial Investigation.</i>	=IFNA(IFS(REGEXMATCH(A3, "how why does which when who guide tutorial learn examples resource ideas tips difference between strategies ways example directory news basics concepts troubleshoot resolve risks beginners upgrade impro ve optimize case study best practices templates pros and cons analysis articles audit benefits blogs build calculate campaign choose common questions consider cost create definition definitive guide earn easy steps essential events explainer video factors find fix grow hacks how to ideal importance of increase infographic information meaning measure metrics mistakes myths opportunities popular practices question s remove set up shortcuts stats strategy study successful tactics techniques terms things to know time trends tricks types updates well explained tutorials framework checklist process plan test glossary sample survey exercises report certification webinar calendar quiz directories to do list design basics"), "Informational", REGEXMATCH(A3, "buy purchase order price quote for sale sale deal offers discount coupon promo code voucher bargain cost pricing cheap affordable expensive premium near me online e-commerce shopping cart checkout shop store retailer dealer supplier marketplace auction bid buy now pay payment finance leasing rent rental subscribe subscription free trial book reserve enquire inquiry quote estimate cost calculator shipping delivery available in stock out of stock pre-order backorder special offer limited time offer flash sale clearance wholesale bulk buy group buy membership reward loyalty gift card cashback trade-in upgrade renew checkout secure checkout"), "Transactional", REGEXMATCH(A3, "best top vs review compare comparison ratings recommendation buyer's guide alternative" feature*" benefit*" cost-effective affordable premium quality deal offers savings discount value choice selection rankings choice user ratings testimonials feedback pros cons evaluation assessment analysis benchmark brand models versions upgrade u pdate launch new latest innovative technology solutions providers vendors suppliers applications software platform sys tems tools equipment machinery accessories devices gadgets electronics appliances products materials suppli* kit pa ckage bundle"), "Commercial", REGEXMATCH(A3, "login register homepage website account portal open access find locate contact us help desk FAQ support customer service map location directions hours site navigate homepage URL service center branch office near me address"), "Navigational"), "Unclassified")

Field	What it does	Formula Used
Explicit Desired Content Format	<i>Specifies if the user seeks a particular format (e.g., video, article, or infographic).</i>	=IFNA(IFS(REGEXMATCH(A3, "video tutorial explainer short video TikTok YouTube"), "Yes - video", REGEXMATCH(A3, "infographic chart graph diagram"), "Yes - infographic", REGEXMATCH(A3, "template sample checklist list"), "Yes - template", REGEXMATCH(A3, "case study report whitepaper PDF brochure catalog study"), "Yes - document", REGEXMATCH(A3, "webinar presentation seminar"), "Yes - webinar", REGEXMATCH(A3, "podcast audio radio"), "Yes - podcast", REGEXMATCH(A3, "eBook book manual"), "Yes - eBook"), "No")

Field	What it does	Formula Used
Explicit Knowledge Level	<i>Reflects the assumed knowledge level of the user (e.g., beginner, intermediate, expert).</i>	=IFNA(IFS(REGEXMATCH(A3, "beginner basic intro starter simple easy fundamental 101 first time"), "Beginner", REGEXMATCH(A3, "intermediate moderate average standard middle level"), "Intermediate", REGEXMATCH(A3, "advanced expert pro professional detailed in-depth"), "Expert"), "Unclassified")

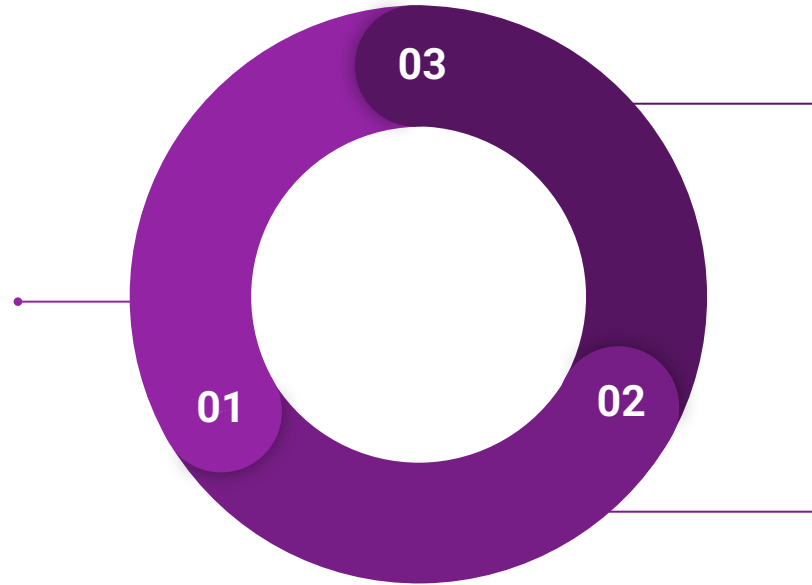
Field	What it does	Formula Used
Explicit User Persona	Identifies the user type (e.g., affluent, cheapskate, luxury, innovator) based on the query.	=IFNA(IFS(REGEXMATCH(LOWER(A3), "(student learner teacher educator researcher professor trainer academic course scholar class college university tutor homework study assignment)"), "Student/Educator", REGEXMATCH(LOWER(A3), "(professional manager consultant business enterprise corporate industry employee freelancer executive director entrepreneur career office workplace job resume cv)"), "Professional", REGEXMATCH(LOWER(A3), "(casual hobbyist enthusiast individual personal diy home family friend weekend daily ordinary simple)"), "Casual User", REGEXMATCH(LOWER(A3), "(affluent wealthy rich moneyed millionaire billionaire upper class elite well[-]?off high net worth investor)"), "Affluent", REGEXMATCH(LOWER(A3), "(cheapskate frugal stingy budget[-]?conscious cheap inexpensive discount deal bargain economical low cost affordable coupon sale clearance)"), "Cheapskate", REGEXMATCH(LOWER(A3), "(luxury premium high[-]?end exclusive designer upscale deluxe opulent lavish extravagant bespoke first[-]?class elegant fancy)"), "Luxury", REGEXMATCH(LOWER(A3), "(innovator innovative disruptor cutting[-]?edge pioneering trailblazer visionary tech[-]?savvy groundbreaking inventor avant[-]?garde revolutionary futuristic game changer)"), "Innovator"), "Unclassified")

Field	What it does	Formula Used
Implicit Intent - Problem/Struggle	<i>Indicates the underlying issue or struggle implied by the query (e.g., "How to fix" suggests a problem-solving need, "no + problem", "won't + desired action" etc).</i>	<code>=IFNA(IFS(REGEXMATCH(A3, "(how to fix how can I fix how do I fix fix(?:ing)? resolve troubleshoot solve problem(?:s)? issue(?:s)? error(?:s)? error code(?:s)? failure(?:s)? crash(?:es)? repair(?:ing)? why not can't cannot won't doesn't not work unresponsive stuck difficult(?:y)? struggle(?:s)? trouble(?:s)? help assist(?:an ce)? support advice what(?:'s is) wrong malfunction(?:ing)? broken bug(?:s)? glitch(?:es)? defective unable freeze(? :s n)? hang(?:s ed)? lag(?:ging)? overheat(?:ing)? no response no power no signal can't load can't update can't connect)"), "Yes"), "No")</code>

Field	What it does	Formula Used
Context	Refers to additional circumstances or scenarios implied by the query (e.g., time, urgency, mood).	<pre> =IFNA(IF(AND(REGEXMATCH(LOWER(A3), "(urgent now today quick immediately asap recent current hurry rush emergency priority fast rapid soon) ")), REGEXMATCH(LOWER(A3), "(mood excited frustrated stressed sad happy angry mad furious irate annoyed upset disappointed depressed anxious overwhelmed exasperated infuriated f\\\\"*k fuck) ")), "Yes - Time (Urgency) & Mood (Emotion)", IF(REGEXMATCH(LOWER(A3), "(urgent now today quick immediately asap recent current hurry rush emergency priority fast rapid soon) ")), "Yes - Time (Urgency)", IF(REGEXMATCH(LOWER(A3), "(mood excited frustrated stressed sad happy angry mad furious irate annoyed upset disappointed depressed anxious overwhelmed exasperated infuriated f\\\\"*k fuck) ")), "Yes - Mood (Emotion)", "No"))), "No") </pre>

Type 1: **Transformer-based** approach

**We apply word
pattern-based
rule-based
classification on
queries**



**We apply a
transformer
model for the
final label.**

**We apply
logic-based
classification on
SERP Features**



search_intent_classifications.csv

11.3 KB • 19 minutes ago

and Demo Results ☆ 📁 📄



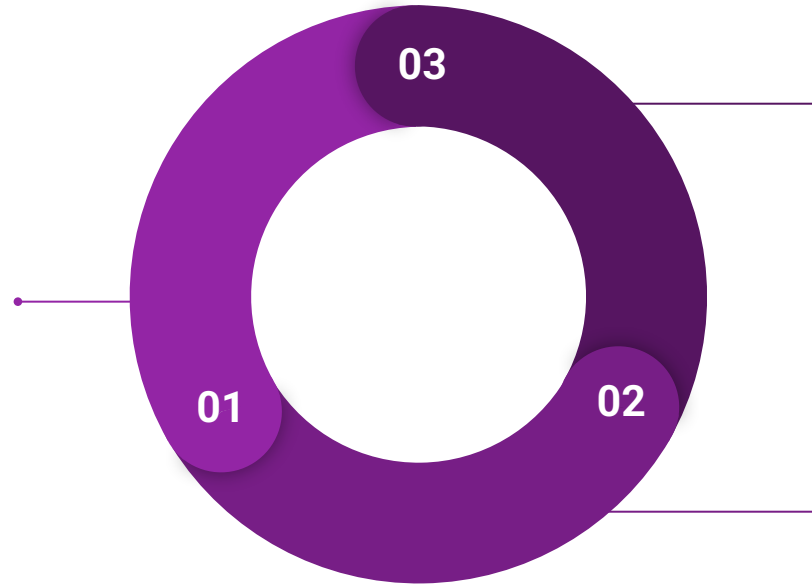
Query: home gym equipment near me Rule-based Label: Commercial, Navigational, Transactional SERP Features: Local teaser pack,Siteinks,Shopping results,Thumbnail SERP Percentages: Informational: 20.0%, Transactional: 40.0%, Commercial: 0.0%, Navigational: 40.0%, Unclassified: 0.0%										
A	B	C	D	E	F	G	H	I	J	
Keyword	SERP Features	Rule-based Label	Final Intent	Combined Input	SERP %_Informational	SERP %_Transactional	SERP %_Commercial	SERP %_Navigational	SERP %_Unclassified	
home gym equipment	Siteinks,Shopping results,TI	Commercial	Commercial	Query: home gym equipmen	57.14285714	28.57142857	0	14.28571429	0	0
best home gym equipment	People also ask,Shopping r	Commercial	Commercial	Query: best home gym equi	40	40	0	20	0	0
at home gym equipment	Siteinks,People also ask,Sh	Commercial	Commercial	Query: at home gym equipr	57.14285714	28.57142857	0	14.28571429	0	0
home gym equipment for sa	Siteinks,Local teaser pack,§	Commercial, Transactional	Commercial	Query: home gym equipmen	33.33333333	33.33333333	0	33.33333333	0	0
best home gym equipment 2	People also ask,Shopping r	Commercial	Commercial	Query: best home gym equi	57.14285714	28.57142857	0	14.28571429	0	0
best at home gym equipmen	People also ask,Shopping r	Commercial	Commercial	Query: best at home gym eq	40	40	0	20	0	0
all in one home gym equipm	Shopping results,Thumbnail	Commercial	Commercial	Query: all in one home gym	57.14285714	28.57142857	0	14.28571429	0	0
home gym equipment near r	Local teaser pack,Siteinks,§	Commercial, Navigational, T	Commercial	Query: home gym equipmen	20	40	0	40	0	0
home gym must have equip	Siteinks,People also ask,Sh	Commercial	Commercial	Query: home gym must havi	40	40	0	20	0	0
used home gym equipment	Shopping results,Thumbnail	Commercial, Transactional	Commercial	Query: used home gym equi	25	50	0	25	0	0
cheap home gym equipment	Siteinks,People also ask,Sh	Commercial, Transactional	Commercial	Query: cheap home gym eq	57.14285714	28.57142857	0	14.28571429	0	0
home gym equipment all in	People also ask,Shopping r	Commercial	Commercial	Query: home gym equipmen	75	25	0	0	0	0
fitness equipment for home	Siteinks,People also ask,Sh	Commercial	Commercial	Query: fitness equipment for	40	40	0	20	0	0
must have gym equipment a	People also ask,Siteinks,Vr	Commercial	Commercial	Query: must have gym equi	75	0	0	25	0	0
home gym all in one equipm	Shopping results,Thumbnail	Commercial	Commercial	Query: home gym all in one	66.66666667	22.22222222	0	11.11111111	0	0
must have equipment for ho	People also ask,Shopping r	Commercial	Commercial	Query: must have equipmen	50	50	0	0	0	0
must have gym equipment f	Featured snippet,People als	Commercial	Commercial	Query: must have gym equi	72.72727273	18.18181818	0	9.090909091	0	0
in home gym equipment	Siteinks,Shopping results,TI	Commercial	Commercial	Query: in home gym equipm	25	50	0	25	0	0
gym equipment for home	People also ask,Shopping r	Commercial	Commercial	Query: gym equipment for h	66.66666667	33.33333333	0	0	0	0
basic home gym equipment	Featured snippet,People als	Commercial	Commercial	Query: basic home gym equ	57.14285714	28.57142857	0	14.28571429	0	0
essential home gym equipm	People also ask,Shopping r	Commercial, Informational	Commercial	Query: essential home gym	50	50	0	0	0	0
home gym basic equipment	People also ask,Siteinks	Commercial	Commercial	Query: home gym basic equ	50	0	0	50	0	0
basic gym equipment for ho	People also ask,Siteinks,Sh	Commercial	Commercial	Query: basic gym equipmen	57.14285714	28.57142857	0	14.28571429	0	0
basic equipment for home g	Featured snippet,Siteinks,S	Commercial	Commercial	Query: basic equipment for l	62.5	25	0	12.5	0	0
best equipment for home gy	People also ask,Siteinks,Sh	Commercial	Commercial	Query: best equipment for h	57.14285714	28.57142857	0	14.28571429	0	0
small home gym equipment	Shopping results,Thumbnail	Commercial	Commercial	Query: small home gym equ	33.33333333	66.66666667	0	0	0	0
used home gym equipment	Siteinks,People also ask,Sh	Commercial, Navigational, T	Commercial	Query: used home gym equi	40	40	0	20	0	0
home gym workout equipme	Siteinks,Shopping results,TI	Commercial	Commercial	Query: home gym workout e	50	33.33333333	0	16.66666667	0	0
home gym fitness equipmen	Siteinks,People also ask,Sh	Commercial	Commercial	Query: home gym fitness eq	40	40	0	20	0	0
home gym equipment amaz	Shopping results,Thumbnail	Commercial	Commercial	Query: home gym equipmen	66.66666667	33.33333333	0	0	0	0
used home gym equipment	Shopping results,Thumbnail	Commercial	Commercial	Query: used home gym equi	60	40	0	0	0	0
compact home gym equipm	Siteinks,Shopping results,TI	Commercial	Commercial	Query: compact home gym e	50	33.33333333	0	16.66666667	0	0
rent gym equipment for hom	Local teaser pack,Siteinks	Commercial, Navigational, T	Commercial	Query: rent gym equipment	0	0	0	100	0	0
best gym equipment for hor	Siteinks,People also ask,Sh	Commercial	Commercial	Query: best gym equipment	57.14285714	28.57142857	0	14.28571429	0	0

https://docs.google.com/spreadsheets/u/1/?authuser=1&usp=sheets_web 'ch Intent

Demo Results - Transformer Approach Search Intent

Type 2: Semantic parsing (**entity-based**) approach

**We extract the
entity data
from
keywords**



**We combine the
entity data with
heuristics to
produce a final
search intent label.**

**We analyse the
entity data for
each keyword**

This approach creates a more comprehensive understanding of user intent by using entities not just as simple flags but as weighted signals within a broader context of query semantics.



semantic_intent_output.csv

180 KB • 2 minutes ago



ML-Enabled Search Intent Classification - Demo Data and Demo Results ☆ 📁 ☁

File Edit View Insert Format Data Tools Extensions Help



Menus



A26

best equipment for home gym

	A	B	C	D	E	F	G	H
1	Keyword	Semantic Intent Label	SERP Features					
2	home gym equipment	Transactional	Sitelinks,Shopping results,Thumbnail,People also ask,Image pack					
3	best home gym equipment	Commercial-Transactional	People also ask,Shopping results,Thumbnail,Sitelinks					
4	at home gym equipment	Informational	Sitelinks,People also ask,Shopping results,Thumbnail,Image pack					
5	home gym equipment for sale	Transactional	Sitelinks,Local teaser pack,Shopping results,Thumbnail,People also ask					
6	best home gym equipment 2021	Commercial-Transactional	People also ask,Shopping results,Thumbnail,Image pack,Sitelinks					
7	best at home gym equipment	Commercial	People also ask,Shopping results,Thumbnail,Sitelinks					
8	all in one home gym equipment	Informational	Shopping results,Thumbnail,People also ask,Image pack,Sitelinks					
9	home gym equipment near me	Transactional	Local teaser pack,Sitelinks,Shopping results,Thumbnail					
10	home gym must have equipment	Transactional	Sitelinks,People also ask,Shopping results,Thumbnail					
11	used home gym equipment for sale	Transactional	Shopping results,Thumbnail,Sitelinks					
12	cheap home gym equipment	Transactional	Sitelinks,People also ask,Shopping results,Thumbnail,Image pack					
13	home gym equipment all in one	Transactional	People also ask,Shopping results,Thumbnail,Image pack,Video preview					
14	fitness equipment for home gym	Transactional	Sitelinks,People also ask,Shopping results,Thumbnail					
15	must have gym equipment at home	Informational	People also ask,Sitelinks,Videos					
16	home gym all in one equipment	Informational	Shopping results,Thumbnail,People also ask,Sitelinks,Video preview,Image pack					
17	must have equipment for home gym	Informational	People also ask,Shopping results,Thumbnail					
18	must have gym equipment for home	Informational	Featured snippet,People also ask,Sitelinks,Shopping results,Thumbnail,Videos,Image pack					
19	in home gym equipment	Informational	Sitelinks,Shopping results,Thumbnail					
20	gym equipment for home	Transactional	People also ask,Shopping results,Thumbnail,Image pack					
21	basic home gym equipment	Transactional	Featured snippet,People also ask,Sitelinks,Shopping results,Thumbnail					
22	essential home gym equipment	Transactional	People also ask,Shopping results,Thumbnail					
23	home gym basic equipment	Informational	People also ask,Sitelinks					
24	basic gym equipment for home	Informational	People also ask,Sitelinks,Shopping results,Thumbnail,Image pack					
25	basic equipment for home gym	Informational	Featured snippet,Sitelinks,Shopping results,Thumbnail,Image pack					
26	best equipment for home gym	Commercial	People also ask,Sitelinks,Shopping results,Thumbnail,Image pack					
27	small home gym equipment	Transactional	Shopping results,Thumbnail					
28	used home gym equipment for sale near me	Transactional	Sitelinks,People also ask,Shopping results,Thumbnail					
29	home gym workout equipment	Transactional	Sitelinks,Shopping results,Thumbnail,Video preview					
30	home gym fitness equipment	Transactional	Sitelinks,People also ask,Shopping results,Thumbnail					
31	home gym equipment amazon	Transactional	Shopping results,Thumbnail,People also ask,Image pack					



Demo Data

Demo Results - Semantic (Entity) Search Intent



Semantic AI-powered/ ML-enabled Keyword Research | academy.mlforseo.com

The process end-to-end

- ✓ Getting your data – data sources run-through
- ✓ Organising your database and keyword categorisation



- ✓ How to integrate semantic keyword research into real-world projects

How to move from traditional to semantic keyword universe – Checklist, based on Semantic ML-En...

File Edit View Insert Format Data Tools Extensions Help Accessibility

100% 123 Default... 10 B I A

D4 Automate and Scale Data Collection Summarise this table

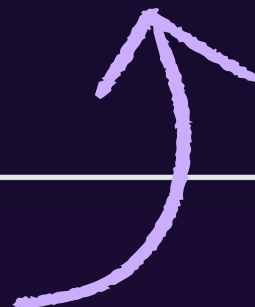
	A	B	C	D	E
1	Related to concept	Step	Done?	Detailed Action	Notes
2		Getting your keywords	☐	Build a Robust Keyword Database	Create a database of keywords, queries, and important terms. Include competitor terms, rank terms, and related queries.
3		Getting your keywords	☐	Use Multiple Data Sources	Google Search Console: Extract ranked queries using APIs or tools like Sea Competitor Keywords: Use SEMrush or Ahrefs to collect data from business Google Auto-Suggest: Expand terms with tools like Pemavor or Data for SE People Also Ask: Use tools like Also Asked or SEO Minion to extract question Trending Keywords: Leverage Google Trends, PyTrends, or exploding topics
4		Getting your keywords	☐	Automate and Scale Data Collection	Merge files and cluster keywords using scripts (e.g., Python, Colab). Use APIs for scalable and efficient data collection. Automate expansions with Google Suggest and similar tools.
5		Getting your keywords	☐	Perform Holistic Analysis	Link queries to user journeys to understand relationships. Perform SERP analysis to identify top-ranking terms and content patterns.
6		Getting your keywords	☐	Add Contextual Research	Pattern-Based Keywords: Generate terms based on patterns (e.g., "affordable"). Content Gap Analysis: Identify missing terms ranked by competitors. Your Own Research: Use first-party insights, user interviews, or internal search data.
7		Getting your keywords	☐	Expand Beyond Core Tools	Extract keywords from YouTube, TikTok, and Reddit. Analyze user reviews to find frequently mentioned terms and entities. Include PPC data from platforms like Google Ads, TikTok Ads, and YouTube Ads.
8		Getting your keywords	☐	Ensure Scalability and Efficiency	Use Big Query for large datasets. Employ tools like Data for SEO for filtering by intent, location, and language. Categorize keywords for semantic analysis and topical mapping.
9		Getting your keywords	☐	Regularly Update and Refine Data	Continuously integrate new data sources. Monitor trends and content gap opportunities to refine the database. Identify entities as distinct, well-defined concepts.

Semantic ML-Enabled Keyword Research Course Checklist

Your workbook should contain these specific sheet names (case-sensitive):

- Keyword Categorisation – Primary keyword data with volumes, competition, intent
- Topics and Descriptions – Topic clusters with descriptions
- Keywords to Topics with sBERT – Semantic keyword-to-topic mapping
- Keyword Suggestions – Related keyword recommendations
- Entity Sentiment Data – Entity analysis and attributes
- Semantic Entity Relationships – Entity connection mapping
- SERP Features Analysis – Search result feature analysis
- Google/YouTube Autosuggest Terms – Auto-complete suggestions
- Query Paths – PAA – People Also Ask data
- Query Paths – Suggested Topics – Related topic suggestions
- Bulk Google SERP – Competitor analysis data

You need this,
at a minimum



To scale the production of semantically-informed content briefs



Content Brief Generator

Google Sheets URL:

Google Sheets API Key:

OpenAI API Key:

Number of Content Briefs (1-20):

Enter a number between 1 and 20 to specify how many content briefs to generate.

Select Topics (up to 3):

Hold Ctrl/Cmd to select up to 3 topics. Topics will load automatically when you enter the spreadsheet URL and API key above.

Generate Content Briefs

6-step starter plan



Create the most comprehensive list of
keywords you can
(extractions, programmatic, synthetic, etc.)



Break them down and categorise them to as many facets as you can



Group them per topic, per entity, per platform, per persona, per context, etc...

 Turn them into briefs
(different briefs for different platforms,
too)

 Assess competition, content production capability and user needs, fit to brand



Chose the ones that serve you the most, supporting the complete user journey cross-platform

I have a confession...

Okay,
what else 🙄

- Information Gain Scoring
- Knowledge graph entries and expansion
- Keyword Clustering approaches with ML
- A ton of patents, analysed and contextualised for SEOs
- Dozens of practicals to work with APIs to get this process to scale

TWO NEW MODULES CURRENTLY IN DEVELOPMENT



Queries in the AI Era

With lessons on Synthetic Queries, Query Expansion Techniques, AI User Prompts, and more ✨



AI Overviews, Brand Discovery & Authority in LLMs

With insights on how to stand out in LLM-driven search engines ✨

10+ hours of video lessons,
tutorials, and a ton of
resources on semantic
keyword research ✨

(Use Code: **BrightonSEO**)



Semantic AI-powered SEO Keyword Research Course



