دانشگاه علوم پزشکی و خدمات بهداشتی، درمانی ایران

Search Strategies



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روش‌های جستجوی پیشرفته در پایگاه‌های اطلاعاتی





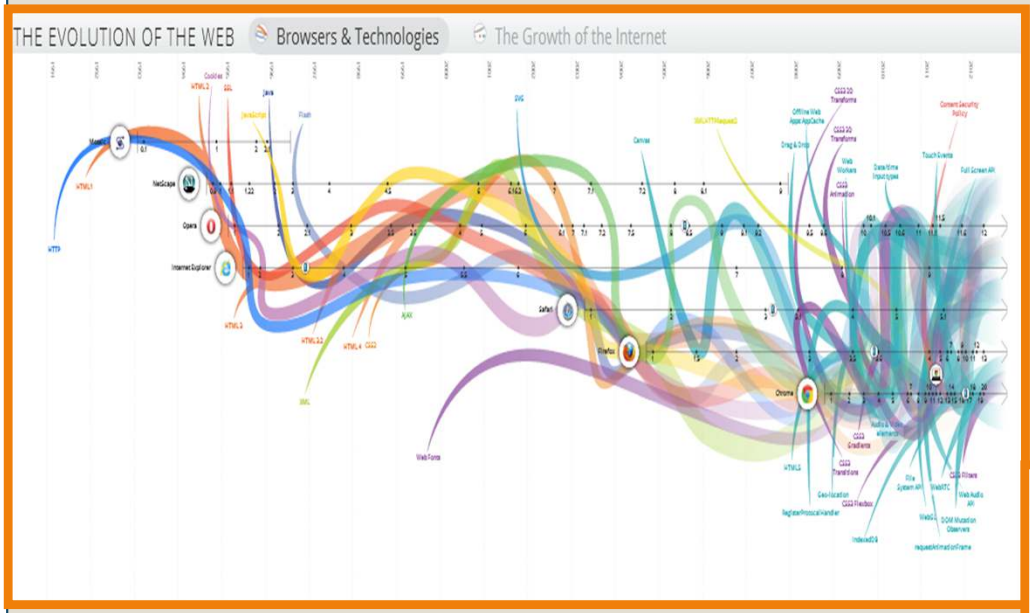
Think and Guess!

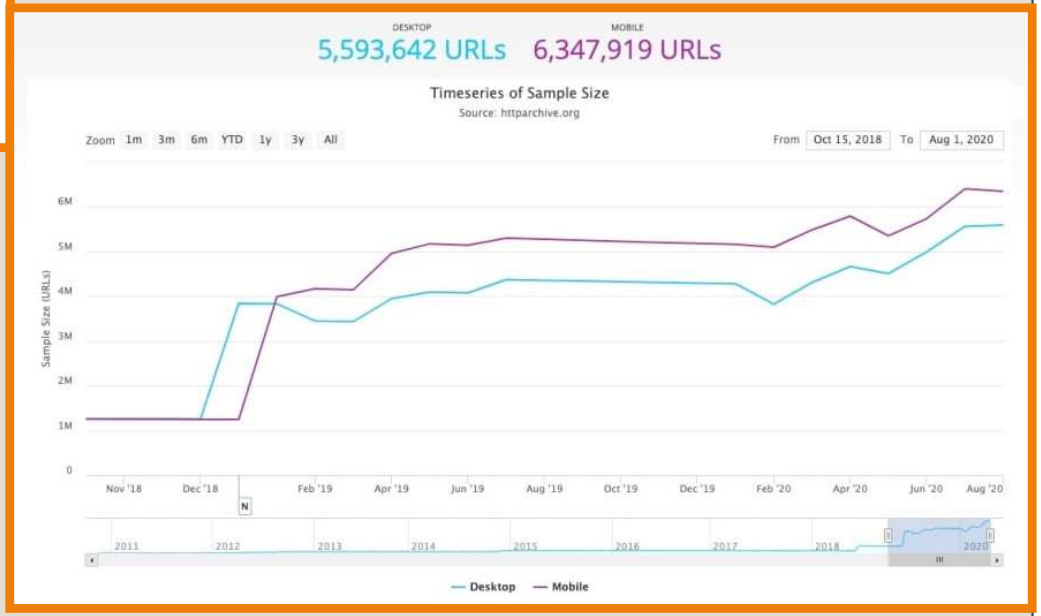


Try Guessing the URL!

Web Growth




THE EVOLUTION OF THE WEB
Browsers & Technologies
The Growth of the Internet


DESKTOP
5,593,642 URLs
MOBILE
6,347,919 URLs
Timeseries of Sample Size
Source: httparchive.org
Zoom 1m 3m 6m YTD 1y 3y All
From Oct 15, 2018 To Aug 1, 2020
Sample Size (URLs)
6M
5M
4M
3M
2M
1M
0
Nov '18
Dec '18
Feb '19
Apr '19
Jun '19
Aug '19
Oct '19
Dec '19
Feb '20
Apr '20
Jun '20
Aug '20
2011
2012
2013
2014
2015
2016
2017
2018
2020
Desktop
Mobile



Five steps to better search results

1. Summarize your topic
2. Select your Keywords
3. Identify synonyms and alternative keywords
4. Link your keywords and phrases
5. Locating and evaluating your results



Create a Search Strategy

1. Define text words
2. Determine synonyms for the text words
3. Control for different spellings or using appropriate truncations
4. Consider brand names when searching for a specific drug treatment
5. Perform test searches – I
6. Identify “controlled vocabulary” (keywords) used for the indexing of databases (MeSH for MEDLINE, EMTREE for EMBASE)
7. Decide on whether to perform an “exploded” or a “focused” search for keywords
8. Check if all words are spelled correctly!!!!
9. Combine logically all search terms
10. Perform test searches – II
11. Customize the syntax of your search strategy to the specific databases

1. Summarize your topic



A great way to test your understanding of the assignment topics to summarize it in your own words:

- **Read your assignment topic or question**
- **Reflect on the aim of the assignment while thinking about the tasks involved**
- **Rewrite the main concepts in a sentence or paragraph.**

2. Select your keywords



After you have summarized the topic, circle, highlight or underline the keywords and phrases that are relevant to your topic.

Discuss the environmental impact of plastic water bottles in Australia.

3. Identify synonyms and alternative keywords



Not all of the relevant literature will use exactly the same keyword, so you will need think about possible synonyms (words that mean the same thing), alternate keywords, or words with variant spellings. If you are having trouble thinking of some alternative keywords it can sometimes help to visit an encyclopedia or dictionary.

Identify synonyms and alternative keywords



Discuss the environmental impact of plastic water bottles in Australia

pollution	packaged water
litter	water container
resource depletion	polyethlyene terephthalate
energy consumption	

4. Link your keywords and phrases



Think about how you will use your keywords and phrases to construct a search.

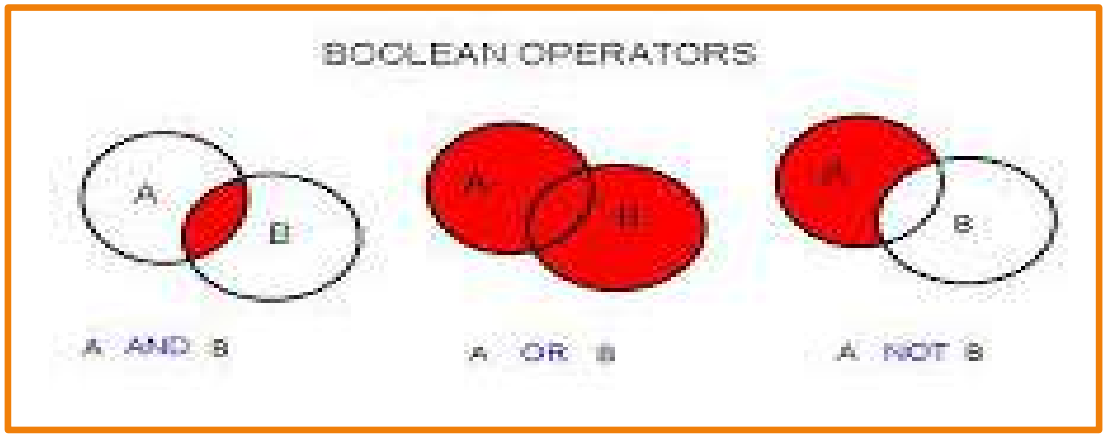
- **Boolean operators**
- **Phrase Searching**
- **Proximity Searching**

5. Evaluating your results



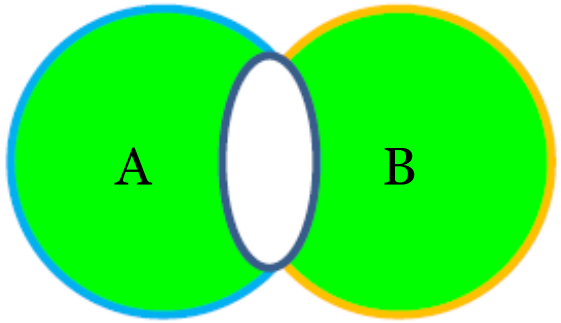
If you are not getting the right results, or are getting too many or too few results, you might need to revise your search strategy.

Boolean Operators



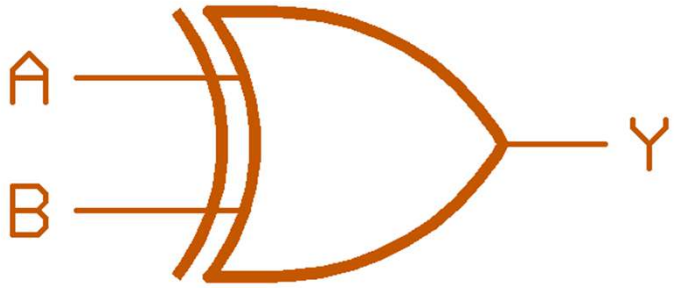
Use AND, OR, NOT to combine keywords. For instance, using AND will find result both words, using OR will find either keyword, and NOT will find only one of your keywords.

XOR Operator



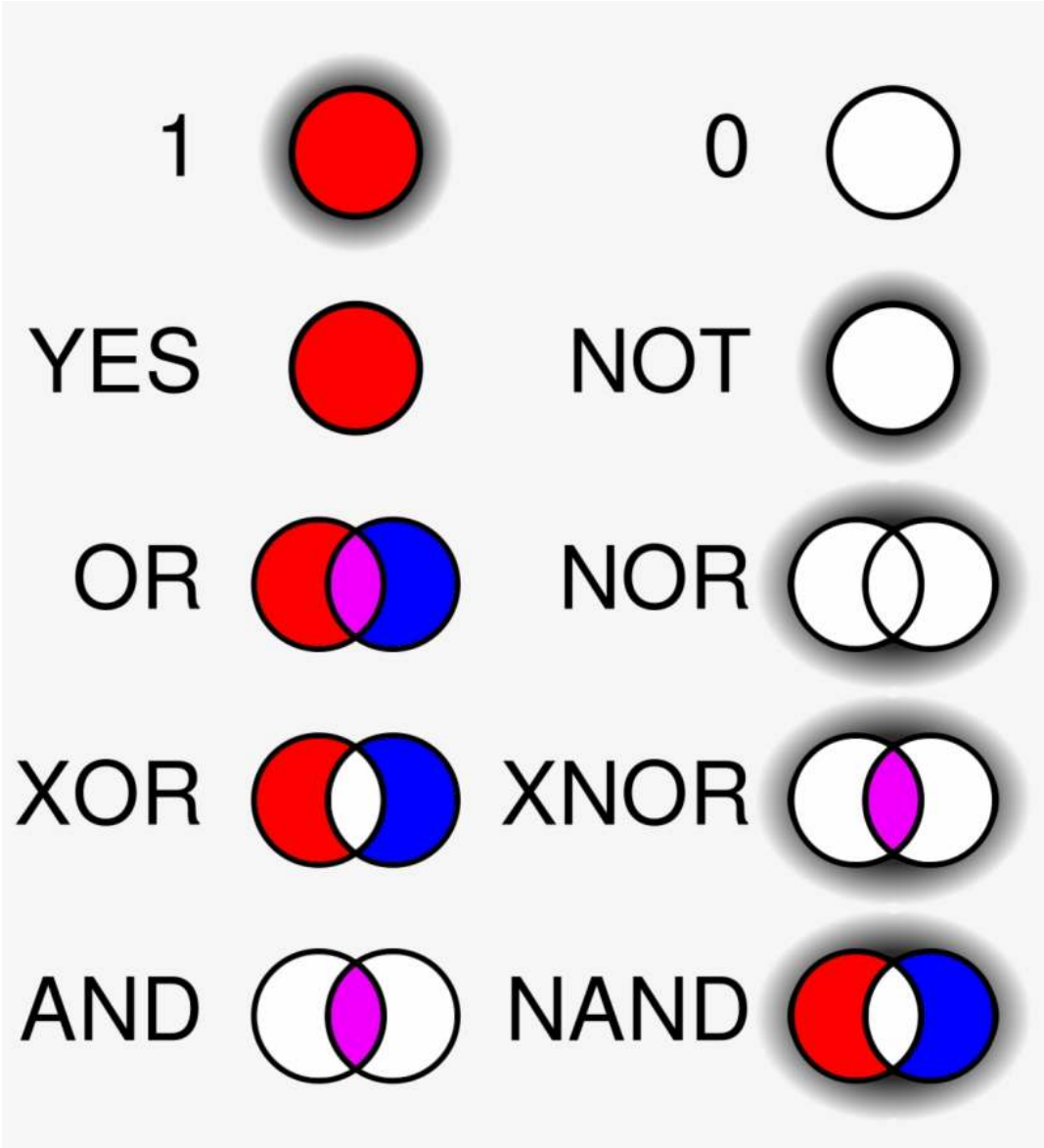
(A OR B) NOT (A AND B)

XOR Operator

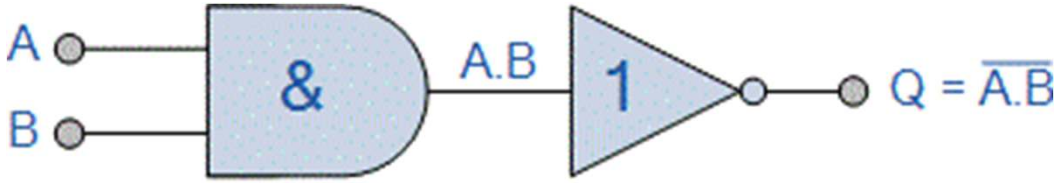


A	B	Y
0	0	0
1	1	0
1	0	1
0	1	1

Operators



NAND Operator



AND = A.B

NAND = Q = $\overline{A.B}$

A	B	Q
0	0	1
0	1	1
1	0	1
1	1	0

Operators

Proximity Searching

- **NEAR Operator**
- **NEXT Operator**
- **Within Operator**
- **Followed By**
- **Adjacency**
- **Pre**

Operators

The AND operator lets you retrieve only those records that include all of your search terms.

AND

The OR operator lets you retrieve records that contain any of your search terms.

OR

The NOT operator lets you retrieve records that contain your first term but exclude the second term.

NOT

The ADJ operators finds two terms next to each other in the specified order.

ADJ

ADJn is a positional operator that lets you retrieve records that contain your terms (in any order) within a specified number (n) of words of each other.

ADJn

Using the frequency operator (FREQ) lets you specify a term's threshold of occurrence in the records retrieved.

FREQ

Operators

Finds terms within 'x' words of each other, regardless of order.

NEAR/x

Finds terms within 'x' words of each other, maintaining the order you entered them.

NEXT/x

Finds words within a specified distance (n) of each other, regardless of order.

W/n

Finds words within a distance, but the first word must precede the second word by no more than n words.

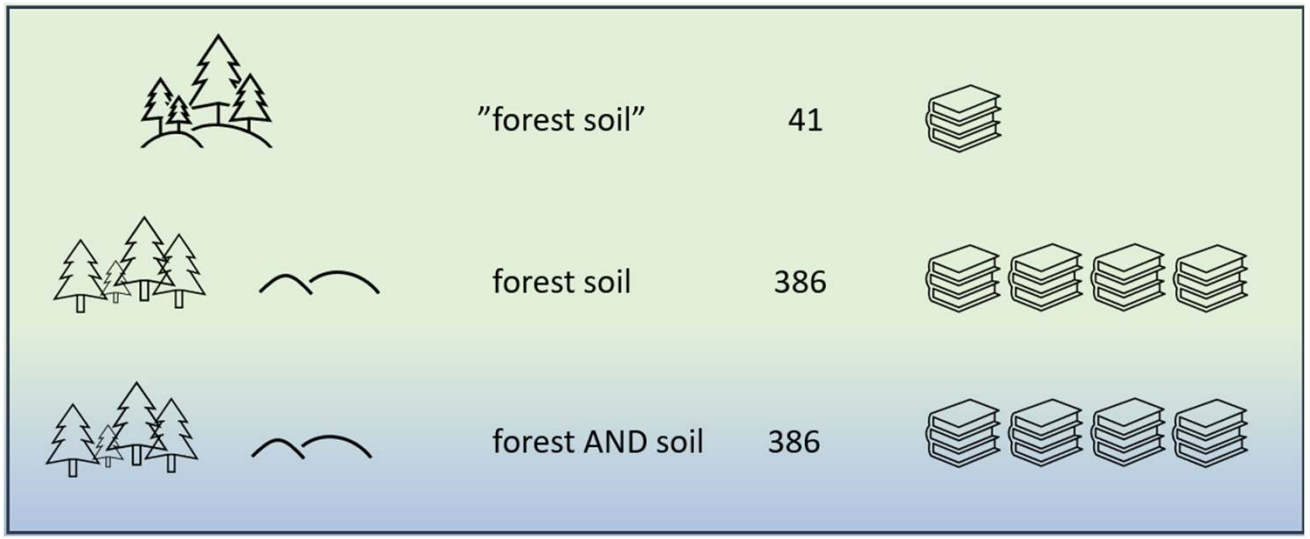
Pre/n

allows users to find multiple search terms appearing within a specified distance of each other. Using the following format: "search terms"[field:~N]

PubMed's proximity search

Phrase Searching

- **Phrase searching refines search results by specifying the exact order and proximity of words.**
- **Phrase searching narrows your search results by allowing you to define precisely how you want the words to appear.**
- **Use quotation marks “ “ to find exact phrase.**



Truncation & Wild Cards

Truncation

- Truncation, also known as stemming, uses a character such as asterisk (*) or question mark (?) at the end of a word, which allows you to search for a root form of a word and pick up any ending.

Wildcard Symbols

- Wildcard symbols can be typed in place of a letter or letters within a keyword if you are not sure of the spelling or if there are different forms of the root word.

Ovid Examples

Truncation	**<rootword>$ or <rootword>***	***Unlimited right-hand*** **truncation searches for variations on a word that are formed with different suffixes. For example, a search for gene* finds occurrences of gene, genes, genetics, and generation.**
	<rootword>$<n> or <rootword>*<n>	***Limited right-hand*** **truncation restricts the number of characters following the word. For example, a search for dog$1 finds occurrences of dog and dogs but not dogma.**
Wild cards	**#**	**The *mandated wild card* character stands for one character within a word or at the end of a word. For example, organi#ation finds occurrences of organization and organisation, and dog# finds occurrences of dogs but not dog. It can be useful for irregular plurals. For example, wom#n finds occurrences of woman and women.**
	?	**The *optional wild card* character stands for zero or one characters within a word or at the end of a word. It is useful for retrieving records with British and American spelling variations because it finds words whether or not the extra character is present. For example, a search for colo?r finds occurrences of color and colour.**

Embase Examples

Wild cards Truncation	*	**Sul*ur** **Cat***	**Sulfur, sulphur** **Cat, cats, catalyst, catastrophe**
	?	**Sulf?nyl**	**Sulfonyl, sulfinyl**
	$	**Economic$**	**Economic, economics**

ASTERISK *

- **The asterisk can be used on most resume databases and non-Internet search engines as a root word/stem/truncation search.**

Sensitivity (Recall)

- The number of relevant results identified divided by the total number of relevant results in existence.

- Sensitivity = Relevant records retrieved ÷ All relevant records × 100

Precision

- The number of relevant results identified divided by the total number of results identified.

- Precision = Relevant records retrieved ÷ All records retrieved × 100

- **A: Sensitivity-Maximizing Version**

- #1 randomized controlled trial[pt]
- #2 controlled clinical trial[pt]
- #3 randomized[tiab]
- #4 placebo[tiab]
- #5 drug therapy[sh]
- #6 randomly[tiab]
- #7 trial[tiab]
- #8 groups[tiab]
- #9 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8
- #10 animals[mh] NOT humans[mh]
- #11 #9 NOT #10

- **B: Sensitivity-and Precision-Maximizing Version**

- #1 randomized controlled trial[pt]
- #2 controlled clinical trial[pt]
- #3 randomized[tiab]
- #4 placebo[tiab]
- #5 clinical trials as toplic[mesh: noexp]
- #6 randomly[tiab]
- #7 trial[tiab]
- #8 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8
- #9 animals[mh] NOT humans[mh]
- #10 #9 NOT #10

PICO: P

Patient, problem or population

جنبه های بیماری، شرایط آن، ویژگی های دموگرافیک مانند: سن، جنسیت و دیگر جنبه های بالینی مرتبط

“Is exercise therapy an effective treatment for *hip osteoarthritis*?”

PICO: I

Intervention

جنبه هایی مانند نوع مداخله، دوز داروها، مدت زمان مصرف دارو

“Is *exercise therapy* an effective treatment for hip osteoarthritis?”

PICO: C

Comparison or control

نوع درمان، استفاده از دارونما یا درمان جایگزین

“Is exercise therapy an effective treatment for hip osteoarthritis?”

PICO: O

Outcome

جنبه های خطر، سودمندی، مرگ و میر، بقاء، کیفیت زندگی

“Is exercise therapy an *effective treatment* for hip osteoarthritis?”

PICO strategy (an example)

- **P**roblem – myalgic encephalomyelitis
- **I**ntervention – Prozac
- **C**omparison – alternative medicine
- **O**utcome – relief of all or some of her symptoms

Once the keywords/phrases are identified, a **simple, focused, clinical question** can be formulated, as follows:

*A **young woman** suffering from **myalgic encephalomyelitis** has been prescribed **Prozac** but would like to know if **alternative therapies** might provide **symptom relief**.*

STAGE ONE			
P	**I**	**C**	**O**
Myalgic encephalomyelitis OR ME OR Post viral fatigue syndrome OR Yuppie flu	Antidepressants OR Fluoxetine OR Prozac	Alternative therapy/ medicine OR Complementary therapy/medicine OR Homoeopathy OR Reflexology OR Nutritional/diet therapy OR Acupuncture	Symptom relief OR Pain relief OR Balanced moods OR Calm sleep OR Increase in energy levels

P	I
(Myalgic encephalomyelitis OR ME OR Post viral fatigue syndrome OR Yuppie flu) AND (Antidepressants OR Fluoxetine OR Prozac)	

STAGE TWO			
P	I	C	O
Myalgic encephalomyelitis	Antidepressants	Alternative therapy/ medicine	Symptom relief
AND	AND	AND	

In summary, to develop an effective search strategy, you must:

1. Break down the clinical scenario and formulate a more manageable question.
2. Identify the key words and make a note of relevant synonyms.
3. Combine using appropriate Boolean concepts.

Simple Vs Advanced Search

Simple Search	Advanced Search
• Very broad • Retrieves thousands of irrelevant files	• Narrowing the search • Boolean operators • Field search

Embase syntax: a comparison with Ovid

Description	Embase	Ovid	Comments
Field search	heart:ti	heart.ti.	
Multiple field search	heart:ti,ab	heart.ti,ab.	
Phrase search	'heart attack' "heart attack" heart-attack	heart attack	Embase: hyphens can be used instead of single or double quotes
Adjacency (same order)	heart next/1 attack	heart adj attack	Ovid: adj = no intervening words
Adjacency (any order)	heart near/n attack	heart adjn attack	Ovid: adjn indicates any order
Truncation (unlimited)	heart*	Heart$	Ovid also *
Mandated wildcard	wom?n	wom#n	1 character (exactly)
Optional wildcard (0-1 char.)	colo*r	colo?r	Embase: * = 0-n characters
Truncation in phrase	heart next/1 attack*	heart attack$	
… with field limit	(heart next/1 attack*):ti	heart attack$.ti.	Fixed order
… not adjacent	(heart near/2 attack*):ti	heart adj2 attack$.ti.	Any order
Truncation + wildcard	sul*ur next/1 dioxid*	sul#?ur dioxid$ Or sul*ur dioxid$	Ovid #? = 1 or 2 characters
Multiple truncation	structur* near/2 relat*	structur$ adj2 relat$	Any order
Multiword phrase (i)	"structure activity" next/1 relat*	structure activity relat$	Next operator is used [1)]
Multiword phrase (ii)	(structur* next/1 activity) and relat*	structur$ activity relat$	

Difference Between Emtree and Mesh

Emtree	MeSH	Emtree benefits for users
Terminology is given in natural language order (e.g., myeloid leukemia)	Terminology may be inverted (e.g., leukemia, myeloid)	Emtree is more intuitive with the terms being more easily recognized.
Over 300,000 synonyms (including over 190,000 drug synonyms)	Includes fewer synonyms (or entry terms): ca. 220,000	There is a higher probability that search terms chosen by users are in Emtree.
Includes all of the MeSH terms, many as Emtree synonyms	Does not include all the Emtree terms	MeSH users find Emtree easy to search.
Relies upon meaning invested in terms by the authors use of them	Has many scope notes to describe how terms are used or intended	Embase users do not need to look up scope notes to understand terms.
Larger: over 71,000 preferred terms	Smaller: over 27,000 preferred terms	Emtree gives users a better chance of finding both drug and non-drug terminology.
Extensive drugs facet with over 31,000 preferred terms	A more limited drugs facet with around 9,250 preferred terms	Emtree has a more comprehensive and up-to-date drugs terminology.
New drug terms updated earlier, and updates are made three times per year	Only established drug terms are added	Emtree gives better results for new drugs.
Over 3,000 specific terms for general and medical devices (e.g., endoscopes, catheters, prostheses)	Fewer medical device terms	Emtree is the best available resource for medical device information.
Polyhierarchical structure with duplicated trees	Polyhierarchical structure with differences between trees	Emtree enables unambiguous and context-free explosion searches.
All drug and chemical information included	Detailed drug information in a supplementary file	All the necessary drug information is in Emtree with no need to resort to other files.
Detailed drug and device trade and manufacturer name indexing	Indexes fewer terms that are not searchable in MEDLINE	Embase users can search or filter for specific drug or device trade or manufacturer names.
Updated three times per year: the latest drugs, diseases, organisms and procedures are indexed and added with back-posting of older records	Updated once per year	Emtree's update schedule ensures that new information is added quickly so that Embase users can easily find current literature.

Field Searching

- **Field searching lets you tell a database exactly where you want your keywords to be found.**

Domain Searching

- **Site:**
- **Inurl:**

SEARCH IN SITE TITLE

- **Intitle:word**
- **Allintitle:word1 word2**
- **Allintitle:“word1 word2”**

Words in URL

- Inurl:word
- Allinurl:word1 word2
- Allinurl:”word1 word2”

Host Search

- Site:URL

Which Way to Search: by Subject or Keyword?

Actually, you can use either or both of these methods to search for your topic. But in a keyword search, the computer will look for the word wherever it appears, and in a subject search it will look for the word as an assigned "subject" term, or even as the first word in a set string of terms.













Thank You



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