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| ***Search*** *(sûrch) v. to look for or examine in an effort to discover something.*Searching is a process of discovery that may expand your knowledge and broaden your views. It is one of the most creative aspects of research. Once you master some techniques, you might even find you enjoy it. Sometimes you may find more information than you want. Knowing how to focus your search can reduce what you find to a more manageable amount. On the other hand, your search might uncover no information at all. If so, you have to be persistent -- possibly trying different approaches to find what you need. Selecting the best source to search, choosing the most appropriate words, and combining them successfully are skills you will develop in this section. After completing this section, you should be able to: * identify appropriate strategies for selecting search terms
* identify types of information available in library databases
* select appropriate library databases
* identify common fields in a library database
* list methods to search using keywords and subject headings
* combine search terms effectively
* describe information available from a search engine
* select appropriate strategies for searching the Web
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| **Brainstorm -- Pre-search Preparation** Before you begin your research, write out a few detailed sentences about your topic. Underline the main words in these sentences. From the description that you wrote, create a list of related keywords and phrases. Once you have an initial list, think of other terms that also describe your topic. Write down any ideas you have, even the ones that seem harebrained; sometimes they end up being the most helpful. If you have trouble thinking of other words, try using a specialized encyclopedia about your subject. Come up with synonyms - other words or phrases that have the same meaning - for your terms. Don't forget to list alternative spellings, abbreviations, and acronyms for words on your list. You should also identify words that have broader or narrower meanings than your original terms. For example, consider using broader and narrower terms for "undergraduate"

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|     broader term | = | university student   |
|       |  original term | = | undergraduate |      |
|   |     | narrower term | = | freshman |     |   |

Brainstorming helps you choose appropriate search terms before you begin. For example, look at the list of keywords and phrases we thought of for this paper topic: *Concerns about email security demand better programming, authenticated email addresses, and more caution from users.*

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| **Keywords:** | **Phrases:** |
| emaile-mailsecurity | programmingcautionauthentication | Internet securityelectronic mail systemssoftware utilities |

Now use the following imaginary topic to practice brainstorming for good keywords and phrases: *Recent studies of Internet users have concluded that spending too much time online can adversely affect a person's psychological well-being. Some surveys found long hours on the Internet can lead to depression and loneliness.*Next consider alternate words or synonyms for one of the main ideas. Make a list of alternate words or synonyms for the term "Internet." Finally, consider alternate words or synonyms for the other main idea: psychological and health effect. List all the terms you can think of that describe this topic.  |

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| **Databases** ***Database*** *(si·lekt´)n. an organized collection of information, usually pertaining to a particular subject.* Think of databases as huge electronic filing systems. They must be highly organized for people to easily find the information they need. There are many kinds of databases. The most common type you will encounter in the library is an online periodical index. These indexes point to the articles published in magazines, journals, and newspapers. Each year millions of articles are published in thousands of periodicals. Not all of them, however, make it into periodical indexes. The companies that own the databases choose which publications to include. When you search a periodical index, you will find only articles from the publications it chose to index. **Online Periodical indexes** contain one or more of the following: * **Citations** - basic publication information for indexed articles (author, title, date, publication name, volume and issue number, and page number).
* **Abstracts** - brief summaries of indexed articles.
* **Full text** - online copies of the text of indexed articles.
* **Full image** - online copies of the exact pages of the article as they appear in the paper edition. Full image copies contain charts, graphs, and pictures that are often left out of full text articles.

**Which database?** *Choosing an appropriate database is an essential part of research. How are you going to choose among those available from your library?* Library databases organize particular types of materials. Some index citations for government documents, conference proceedings, book reviews, or magazine and journal articles. Others, like your library catalog, focus on a particular collection. Knowing what type of information you are looking for will make your selection easier. Most library databases specialize in a particular subject. There are databases for education, business, anthropology, engineering, and architecture - virtually every academic discipline! Other databases are more general or multi-disciplinary, indexing popular and scholarly periodicals from a wide variety of topics.

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| **For articles about:** | **You might use a:** | **Such as:** |
| privacy on the Internet | multi-disciplinary database | Expanded Academic ASAP |
| fashion industry | business index | ABI Inform |
| mainstreaming | education index | ERIC |

Databases available to you are listed on the B. Davis Schwartz Memorial Library's Complete List of Databases Web page: [http://www.liu.edu/cwis/cwp/library/database.htm](http://www2.liu.edu/cwis/cwp/library/database.htm). Many of these databases are accessible from any University computer, and some can be accessed from remote locations. You may also want to ask a reference librarian who can usually recommend the best ones for your topic. **Fields** **Fields** are the basic building blocks of a database. A set of fields makes up a **record**. Since each database organizes different types of information - documents, journal and magazine articles, statistics - fields will vary depending on the database you use. In most databases, you can search specific fields when you are looking for precise information. In the example below, the fields listed are those included in most bibliographic citations.

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| **TITLE:** Privacy, the Workplace and the Internet**PUBLICATION:** Journal of Business Ethics**DATE:** December 2000**VOLUME:** 28**ISSUE:** 3**AUTHOR:** Seamus Miller; John Weckert**SOURCE TYPE:** PERIODICAL**START PAGE:** 255-265**SUBJECT TERMS:** StudiesWork environmentPrivacyElectronic mail systemsWorld Wide WebSurveillance**ABSTRACT:** This paper examines workplace surveillance and monitoring. It is argued that privacy is a moral right, and while such surveillance and monitoring can be justified in some circumstances, there is a presumption against the infringement of privacy.  |

**Title:** Searching the title field will find this article. **Publication:** Name of the periodical. **Date:** Date that the article appeared in the publication. **Volume:** Publication volume number. **Issue:** The number assigned to that specific issue. **Author:** Searching for the name of the author would find this record. **Source Type:** Specifies the type of publication or resource the article appeared in. **Start page:** The pages on which the article appears. **Abstract:** Provides a summary of the article. **Subject Headings** Most periodical indexes organize their records by subject so that you can find all the articles about your topic under one term. You may have noticed the field for **Subject Terms** in the previous database record. In some databases, subject terms are called **Descriptors**. The index creators have created a list of approved subject headings to help you locate all the relevant articles on your topic. *How do you find the approved subject headings?* 1. Use a **subject guide**. Some indexes provide a list of subject headings. If you search for a word that is not in the index, it may suggest an approved subject heading you could use. This list is called a subject guide or a thesaurus.

Cross Reference in a ThesaurusIn this example, there are 1,712 articles about the Internet in this database. If you looked for articles using the words **Information Superhighway**, this thesaurus would direct you to use the subject heading **Internet**. 1. **Guess**. By selecting good keywords you may get lucky and find out your words are the same terms the indexers chose as a subject heading.
2. Look at the **subject headings for one good article**. Find one good article for your topic and look at the subject headings listed. Entering another search using the best subject heading should help you find relevant information.

**Keyword Searching** One good way to find relevant articles is to do a keyword search first. Remember all those words you brainstormed when you first started to think about searching for information on your topic? Keyword searching allows you to look for those words anywhere in the database record. If you do find one good article, you can then search using its Subject Headings. Let's say you searched using the keyword **privacy**. Look at the following record to see where the database found that word.

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| **Authors**Hawkins, Dana. **Title**Privacy worries arise over spyware in kids' software. **Source**US News & World Report. p 55. 2000 July **Subject Headings**Computer privacyInternetSoftware **Abstract**Many free programs, including games, that are downloaded from the Internet and display advertising contain spyware, a type of program that can violate privacy and relay information over a users Internet connection.  |

Use keyword searching to: * start your research
* identify the subject headings used for your topic
* find specific information (a fact, date or name)
* find every occurrence of the words you enter in that database

Searching using a single keyword may be easy; but most of your topics are probably more complex than a single word can describe. The following pages will give you some tips for combining more than one idea effectively. **Subject Searching Advantages** Subject searching can help you find appropriate articles more quickly because you use the vocabulary that the database producers use to classify the articles in their database. With keyword searching you are taking an educated guess about what words to choose for your search. However, you often do not know what the subject terms are for a specific database. Keyword searching can help you find Subject Headings.  |

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| **Combining Ideas - Boolean Logic** Because databases are highly structured, you can use special techniques to search them more effectively. When you want to find more than one word or idea, you need to enter your search in a way that the database will understand. Connector words such as **AND** and **OR** are important to use when you combine ideas. The following pages will show you how to successfully search using these two terms. When you want to find articles containing two or more ideas, you should connect the words in your search with AND. Using AND between keywords means that **both** terms must appear somewhere in the record. AND is used to **narrow** a search. Students AND InternetStudents **AND** InternetEntering this search in a periodical index would find articles that contained the terms students and Internet. If an article only had one of these terms, it would not be retrieved by this search. AND is best used for linking different ideas. You can use **AND** many times in a single search: Students AND Internet AND AssignmentsStudents **AND** Internet **AND** AssignmentsYou can also use OR to combine keywords in a search. Using OR means that either keyword can be in the article for it to be retrieved. OR is best used to search for **synonyms** of a concept. Because any one of these words could show up in your articles, OR **broadens** your search. Internet OR WebInternet **OR** WebUsing this search in an online periodical index would find all of the citations that mention either Internet or Web. You can string together words using **OR**: Internet **OR** Web **OR** Online **OR** Digital **OR** WiredYou can make very complex searches by combining the use of **AND** and **OR** in a technique called nesting. Advanced researchers often look for comprehensive information about a topic - rather than just taking five articles that look pretty good. They can use a technique called nesting which lets them do many searches at once. For example: (Community **OR** Communities) **AND** (Internet **OR** Web **OR** Online)This one keyword search in a periodical index would find articles that had one of the following combinations: * Community and Internet
* Community and Web
* Community and Online
* Communities and Internet
* Communities and Web
* Communities and Online

Constructing these searches may take a little longer, but it will save you from creating many searches and remembering what combinations you have already tried. Did you know that the terms **AND** and **OR** are called Boolean operators? The three main operators are: **AND**, **OR** and **NOT**. **NOT** logic eliminates unacceptable or irrevalant terms from a search. To retrieve information about drugs, excluding alcohol, alcohol must not appear in the same record as drugs. Drugs NOT AlcoholDrugs **NOT** Alcohol**Plurals, Truncation, and Wildcards** Some databases will automatically give you both the singular and plural forms of words that form their plural form by adding an "s" to the singular. Other databases are more literal, and you need to put both singular and plural forms in your search. One way that you can do this is to use a process called truncation. With truncation, you use the stem of a word and add a symbol that will stand for any letters that follow that stem. For example, by adding a symbol such as an asterisk (\*) to the stem, "moral," you will retrieve all of the following: moral, morals, and morality. For words that use different letters in the word to form the singular and plural, you can use what is known as a wildcard. This is a symbol that stands for any letter of the alphabet. For example, for woman and women, use the wildcard "?" to substitute for the "a" or "e", wom?n. This will retrieve both woman and women. Not all databases use the same symbols so you need to use the **Help Screens** provided by each database to know which symbols to use. **Finding the Articles** So you have the citations, but where are the articles? If an article is not fulltext in the database that you are using, it may be fulltext in another database. You can use the Ebsco A-to-Z Full-Text Electronic Journal Search page (<http://atoz.ebsco.com/Titles/7536>) to see if the journal you are looking for is full text in any other databases. If you need help, just ask for a librarian. For those articles not in full text, you need to search the library catalog to see if the library owns a copy of that magazine or journal. Each department that holds periodicals also has a list on its own web site that lists the periodicals held in that department: Periodicals Department: [http://www.liu.edu/cwis/cwp/library/period/perhome.htm#holdings](http://www2.liu.edu/cwis/cwp/library/period/perhome.htm#holdings) Library and Information Science Library: [http://www.liu.edu/cwis/cwp/library/lis/lisperti.htm](http://www2.liu.edu/cwis/cwp/library/lis/lisperti.htm) Government Information: [http://www.liu.edu/cwis/cwp/library/gov/gov\_per.htm](http://www2.liu.edu/cwis/cwp/library/gov/gov_per.htm) If one of these departments has the journal you need, you will have to go to that department to get it. You may find that it is a paper copy or it may be on microfilm or microfiche. If no departments of the library have the journal you need, you can go to the Circulation Desk and request an interlibrary loan. Sometimes, you need more information beyond what you find in printed publications. The Internet may be a good place to look. So let's talk about using your search skills to get relevant information from the Internet.  |

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| **Untangling The Web** Millions of Web pages are available to you, but how do you find the best ones for your research? Many libraries review and organize Web pages. Start with the Reference Department's Virtual Reference Collection at [http://www.liu.edu/cwis/cwp/library/libhome2.htm#inte](http://www2.liu.edu/cwis/cwp/library/libhome2.htm#inte) which will help you quickly locate quality sites. To find other information on the Web you will need to use a search engine. **Which Search Engine?** How can you choose a good search engine? Ask yourself: 1. Which type of information is in the search engine?
2. How is the search engine organized?

Most search engines collect all sorts of Web pages on a wide variety of topics in their vast databases. All large and general search engines, such as *Altavista* and *Google*, allow you to search by keyword. Some, like *Yahoo* and *Excite*, also organize sites into subject categories. These subject categories are great if you are looking for a site that has information on a general topic. Specialized search engines are sometimes organized around a type of material, like newspaper articles or stock market quotes, or they may search pages on a particular subject, such as medical or travel information. They are good sources for finding the best sites for your research because they may provide site reviews or only include those Web pages that have verified information. When you use a search engine, you are looking for terms that appear on pages in the search engine's database, rather than searching the Web in real time. Even the largest search engines only contain about 1/6 of the Web in their database, so if you only use your favorite search engine you will be missing out on over 80% of the available resources. Every search engine is different, from the way you search it to what it contains. You will probably want to select a few search engines and learn the tricks for searching those effectively. **Search Strategies** The following search techniques will be helpful when trying to find information on the Web. **Choose good keywords and phrases** You must search using the same words that appear on the page. Brainstorming before you start searching will generate a good list of keywords and phrases. Remember to think of alternate spellings and abbreviations for your topic. **Be specific** You can create more targeted searches if you use phrases. Most search engines require that you put quotes around a phrase. Many search engines are also case sensitive. **Try different searches** Most search engines use sophisticated equations to calculate the number of times your search terms appear on a page. Pages that seem to best match your search request are listed first. If the first 30 sites are not relevant, try a different search. If you are not satisfied after a few searches, try a different search engine. **Use advanced search techniques** Many search engines have advanced search capabilities such as limiting by language or type of information. Read the help screens to see which special features are available in your favorite search engine. **Browse a subject list** Locate a search engine that organizes pages by subject to find useful sites. Start with a general category and choose increasingly more specific sub-categories. The appropriate subject category will give you a list of pages on your topic available in that search engine. **The Future Of Searching** In the future it will be even more difficult to distinguish between library databases and search engines. Even now, there is some crossover as some library databases, such as WorldCat, index Web-based journals, and search engines include select library resources. While it is not yet possible to search both the library and the Web simultaneously, you can use metasearch engines such as *Dogpile* or *SavvySearch* to search many different search engines at the same time. These are helpful if you want to see a larger sample of information available on the Web or you are looking for a unique fact. The way we search for information will change in the future. Programs may be able to interpret the way we ask questions. Instead of finding the appropriate subject heading for your topic, sophisticated natural language processing will allow you to enter a question and retrieve answers from a variety of sources. Soon you may not even need to search for information. Intelligent agents will do much of the work. They will filter all available information and retrieve only the data that you need. The information they find will become increasingly tailored to your interests as they evolve to match what is important to you. For now though, without intelligent filtering software, we must wade through all available information to find those articles and Web sites that will be useful for our research. To do this successfully, we must be able to identify appropriate databases and search engines, understand how they are organized, and search them effectively. **... your search is over.**Successful searching includes brainstorming for keywords and phrases, choosing appropriate databases or search engines, and combining terms effectively. Though information constantly changes on the Web, understanding these steps will help you find sources for your research. Keep in mind that search engines and library databases regularly update their appearance and add new features. Look for the help pages; they will highlight the best way to search. Once you finish searching, you need to decide if the information is appropriate for your research. The sources you use must be documented properly. In [Section 3](http://www2.liu.edu/cwis/cwp/library/workbook/locate.htm) we will discuss how to locate, evaluate, and cite sources of information |