Assignments Mathematical Institute

Library Instruction February 28, 2018, MI

Feedback

Introduction

The exercises for this course on information literacy are meant to give you an overview of the services of the Universitaire Bibliotheken Leiden and to introduce you to strategies for finding the right information to do your research. Most assignments start out from the Catalogue of the university library. Please sign in with your ULCN account to get full access.
http://catalogue.leidenuniv.nl

Citing

There are many different styles with which you can refer to an article (cite). One of the best known examples is the APA-style 6th generation you will be using in these exercises. It is important to keep your references consistent so people can easily find them in the library. Some examples are

Book:

Author, A. A. (Year of publication). *Title of work: Capital letter also for subtitle (2nd ed.)*. Location: Publisher.

Nahin, P. (2010). *An imaginary tale : The story of √-1*. Princeton, NJ [etc.]: Princeton University Press.

Chapter in book:

Author, A. A., & Author, B. B. (Year of publication). Title of chapter. In A. A. Editor & B. B. Editor (Eds.), *Title of book* (pages of chapter). Location: Publisher.

Eie, M. (2013). Euler Decomposition Theorem. In *The Theory of Multiple Zeta Values with Applications in Combinatorics* (pp. 85-121). World Scientific Publishing Pte.

Article:

Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article. *Title of Periodical, volume number*(issue number), pages. http://dx.doi.org/xx.xxx/yyyyy

Weil, A. (1984). Euler. *The American Mathematical Monthly, 91*(9), 537-542.

Using a reference manager makes citing a lot easier. Have a look at the Mendeley description at the end of this document.

Exercise 1: Library Catalogue

Go to the Library Catalogue and do a search in 'All contents' with 'heavenly mathematics' (no quotation marks).

a) How many results do you find? Are they all relevant?
b) How many different resource types are available?
c) Search within All Contents for '"heavenly mathematics"' (with the double quotation marks surrounding your terms). How do the results change?
d) Restrict the selection to e-books. Open the online edition of 'Heavenly Mathematics : The Forgotten Art of Spherical Trigonometry'. Go to chapter 8. What is the armillary sphere?
e) Now search within 'Leiden Collections' (where the printed books from Leiden can be found) for the book 'Fibonacci numbers' by Vorob'ev. Where can you find this book in the library?
f) Have a look at the tab 'Special Collections'. Here you will find historical collections of great value. Can you find the original letters from Pascal to Huygens? The original documents can be viewed in the central university library at Witte Singel.

Exercise 2: Fractal patterns

Sometimes you have to puzzle a little to find the source of a theory. In this case we want to find the original article on the fractal sets that were later called Mandelbrot sets. The game is to find as many ways as possible to solve this question. Try at least to:

a) Find by reference (later publications may refer to Mandelbrot's publication when they discuss the Mandelbrot set) in a database such as MathSciNet, ZbMath or Google Scholar. Hint: if a theory becomes old, authors sometimes assume it is part of common knowledge, sort your findings by date.
b) Check the publications of Mandelbrot
c) Check an encyclopedia or book on the topic (with Wikipedia you may check your answer; it also tells you who named these fractal sets)

Exercise 3: MathSciNet

Go to Find Databases and open MathSciNet. In this exercise we will have a look at the Mathematical Subject Classification.

a) If you already have a research subject, check what classifications fit your subject best (try to find two). If it is a recent classification, check what older category it would also fit. If you do not yet have a subject, check for Fibonacci primes. Use 'Free tools' => 'Search MSC'.

b) Now we will check by doing a search on keywords in MathSciNet. Choose to search in anywhere and choose some keywords for your subject or use 'Fibonacci prime*'. Check out the MSC's mentioned. Which are the most common? Are they the same as the ones you found for question a?

c) Go to the tab citations in the search screen. Search on subject and enter the MSC-category you think most likely to contain your answer. From the most cited papers and books, pick a journal article that is closest to the subject you are looking for. Read it and tell in one or two sentences (in your own words) what the most important findings are. Give a correct reference in APA-style to this article.

d) From the references or citing articles, pick one you think interesting and do the same as you did for the article in c.

e) Go back to the publication search. Look for an article using at least one keyword with synonyms (cat OR feline) and a MSC-category (choose primary/secondary MSC). Write down your search terms and category. Are the results relevant?

f) Is there anything you would like to change to increase the number of results? Write down what and why.

g) Now repeat the search but replace the MSC-field with a keyword with synonyms describing the MSC-classification. Write down your search terms and category. How do the results compare to the search in f?

Exercise 4: Zentralblatt MATH

Go to find databases and open Zentralblatt MATH. We will first repeat the search from MathSciNet to see the differences in contents they cover.

a) Repeat the search from 2g with a 'Structured Search' in Zentralblatt. Do the results differ a lot from those ones found with MathSciNet? What might be the cause?

b) Check the right column. In which journal can you find the most articles on this specific subject?

c) Who is the most active mathematician for the search terms you used?

d) Check out his/her research profile. Is there a paper/book you think interesting but hadn't found before? Note it down and give a correct citation in APA-style.

e) Check for a common formula on your subject or use Binet's formula

$$F_n = \frac{\varphi^n - \psi^n}{\varphi - \psi} = \frac{\varphi^n - \psi^n}{\sqrt{5}}$$

. Make sure to use a question mark in front of your variable names (this helps find the formula even if someone uses x instead of \rho)!

For example Fermat's theorem: ?a^?n + ?b^?n=?c^?n

Check if you can find an interesting article. Note it down in the APA-style.

Exercise 5: Other databases

Go to Web of Science (Find Databases) or Google Scholar. Enter the same search terms you used in 2g and 3b. Note down:

a) The database you chose.
b) How the results differ (number, relevancy, citations of the article, publication type)
c) Why and when these databases are interesting for mathematicians
d) What you could do to improve the results if necessary.

Exercise 6: Articles

Find the following references and answer the question. They are all available at Leiden University.

a) Nescolarde-Selva, J., Usó-Doménech, J. L., & Lloret-Climent, M. (2015). Mythical systems: mathematic and logical theory. *International Journal of General Systems*, *44*(1), 76–97.
Answer: from the second paragraph, what does every myth involve?

b) Vaintrob, A. (1997). Melvin–Morton Conjecture and Primitive Feynman Diagrams. *International Journal of Mathematics*, *08*(04), 537–553.
http://doi.org/10.1142/S0129167X97000275
Answer: from the first paragraph, how can the Jones Polynomial V of knots be constructed?

c) Tropp, J. A. (2004). Greed is good: Algorithmic results for sparse approximation. *IEEE Transactions on Information Theory*, *50*(10), 2231–2242.
http://doi.org/10.1109/TIT.2004.834793
Answer: what is the core algorithmic question according to the introduction?

Exercise 7: Arxiv

Arxiv.org is a database of pre-print and Open Access articles. Look up the following entries and answer the questions:

a) Uffe Haagerup submitted a preprint in arXiv on certain polynomials. Give the Arxiv-identifier of this article.
b) Gilles Pisier submitted an article on Khintchine inequalities in 2014. In it he refers to two out of three parts from a standard work. What standard work is it and where can we find it in our library?
c) Has Pisiers article already been published apart from the preprint on Arxiv? Give a correct citation in the APA-style.

Lending books

If you want to take a book from the Snellius library for home study, please fill out a loan form such as the one below. This way we know a book is not missing, but used. It also helps us to get an idea of what books are popular and we may use this information to increase sections of the library.

If you want to return a book: there is a large book box at the front of the Snellius library. This box is emptied daily so we can take the book of your LU card and return it to the shelf.

Books from other libraries can be requested through the catalogue and then picked up at the Gorlaeus Library (across the road, first floor in the middle of the complex) or one of the other university libraries. If you can't find the book you are looking for in Snellius, please request it as well, so we can help you locate it or so we can buy a new one if it really is missing.

A sample lending form:

Barcode (inside front cover):	Lent to:
Subject heading & booknr. (spine of the book):	**Pers. Nr. LUcard, Choose s / m / g** **8 figures:**
Author:	
Title:	No library pass or student card? Please fill in (working)address & phone number
Volume/year:	
The undersigned declares to have borrowed the abovementioned book on / / 20 for the duration of **21 days**, under the conditions for borrowing as stated by the Leiden University Libraries. https://www.library.universiteitleiden.nl/about-us/library-locations/science-library	

Mendeley

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After installing Mendeley and its plugins, you will see a new tab 'References' in Word/Libre Office. If this is the document you answer your questions in, go to the end of the document with your cursor and click on 'Insert Bibliography'. To add a citation, click on the Insert Citation button underneath References. After you have added the first citation to Mendeley, you can choose the citation style. In these assignments we will use the APA sixth edition style.

Adding references to Mendeley can be done by hand, by adding a pdf or by adding bibliographic data, for example your search results from Web of Science. Have a look at the tutorials on the Mendeley website: https://community.mendeley.com/guides

For specific information on coupling Mendeley to Bibtex, have a look at the following tutorials:
http://barrington.cranfield.ac.uk/help/BibTeXMendeley.pdf
http://libguides.mit.edu/c.php?g=176186&p=1159535#9

Mendeley also has a web version in case you can't install on the campus computers. This will be synchronized with your desktop version of Mendeley. In this case you have to add the correct citations yourselves in the following APA-style, have a look at
http://www.apastyle.org/learn/tutorials/basics-tutorial.aspx for more information.

To add a reference from Zentralblatt MATH look for the button called BibTex. In MathSciNet check for the button Alternative Formats and choose BibTex.