

# Lab books and note books

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September 3, 2018

# Outline

M1-S0: Lab books and note books

M1-S1: Note-taking concerns everyone

M1-S2: Note-taking: a quick history

M1-S3: From text files to lightweight markup languages

M1-S4: Notes (and codes) that are archived but can evolve with version control systems

M1-S5: Finding one's way with tags and desktop search application

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└─ M1-S0: Lab books and note books

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# Lab books and note books

1. Note-taking Concerns Everyone
2. A Quick History of Note Taking
3. From Text Files to Lightweight Markup Languages
  - ▶ Demo: markdown
4. Note Archiving and Evolution with Version Control
  - ▶ Demo: gitlab
5. Labels and Search Engines
  - ▶ Demo: DocFetcher

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## Lab books and note books

└─ M1-S0: Lab books and note books

└─ Lab books and note books

Lab books and note books

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Lab books and note books

└ M1-S1: Note-taking concerns everyone

└ Where are we?

Notes This section discusses a much wider issue than *reproducible research* (RR). Implementing RR requires thorough note-taking and note-taking concerns everyone. The purpose of this section is therefore to remind the reader / auditor that he/she already knows: **note-taking concerns everyone**. Few examples are used to that end.

Where are we?

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A XIVth century manuscript with the works of Aristotle owned by Nicasius de Planca (gallica.bnf.fr / Bibliothèque nationale de France).

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### Lab books and note books

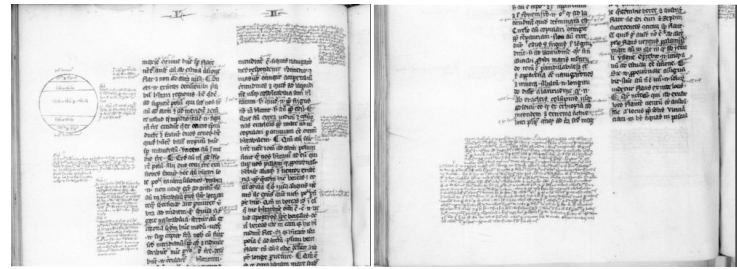
└ M1-S1: Note-taking concerns everyone

└ The scholar annotating his book / manuscript

Notes We see a manuscript from the XIVth century heavily annotated by its owner Nicasius de Planca. This kind of note-taking was and remains extremely common. You should nevertheless avoid it when reading books from a library or from your friends!

The next two slides show a case of paramount importance for the History of Science.

# The scholar annotating his book / manuscript



A XIVth century manuscript with the works of Aristotle owned by Nicasius de Planca (gallica.bnf.fr / Bibliothèque nationale de France).

# Galileo observing Jupiter's moons

Sc. Príncipe.  
Galileo Galilei. Humilis. Servo della Ser. V. inuigilano.  
Do assistere, et de ogni spirito f. bore no idem satisfare  
alario che non della Lettera di Matematico nella sua  
di di Padova,  
In fine d'essere determinato di presentare al Sc. Príncipe  
l'Orbita et il f. essere di formamento inalterabile f. qui  
ragioni et in breua trattativa o terrestre sono di breue qual-  
che nuova artificio nel maggior segreto et alora a disposizione  
di il. Sc. L'Orbita anata nelle più re d'ite speculazioni di  
prospettiva. In l'antaggio di scoprire l'opra et volo dell' inuis  
di due ore et più di tempo prima et dopo l'ultima ora et distinguendo  
il numero et la qualità dei satelliti giudicare la sua fissa  
pallorosi, etta circa al cambiamento o alla fuga, o pure anzi  
nella pagina aperta vedere et particolarmente distinguere ogni suo  
modo et particolarmente.  
1610. 7. di Gennaio



Galileo Galilei's notes while observing Jupiter in January 1610 with his telescope (Wikimedia Commons).

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└ M1-S1: Note-taking concerns everyone

└ Galileo observing Jupiter's moons

Galileo observing Jupiter's moons



Galileo Galilei's notes while observing Jupiter in January 1610 with his telescope [Wikimedia Commons].

Notes The first observation was done on January 7 1610. Galileo Galilei first thought that he found new stars close to Jupiter (see the [Wikipedia page](#)). But after several nights of observation, he realized that these "stars" were in fact circling around the planet, **they are satellites!** He named the group of four the Medicean stars, in honour of his future patron, Cosimo II de' Medici, Grand Duke of Tuscany, and Cosimo's three brothers (Wikipedia).

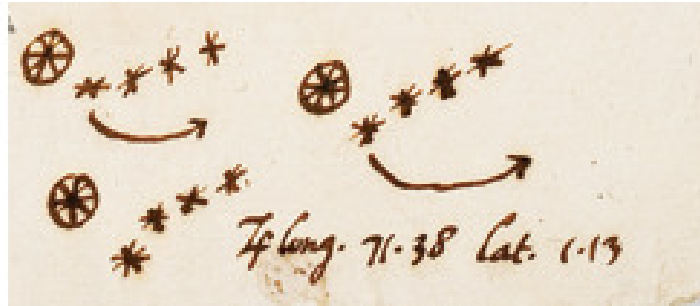
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└ M1-S1: Note-taking concerns everyone



The small "stars" are in fact orbiting around Jupiter, they are doing what the Moon does around the Earth [Wikimedia Commons].

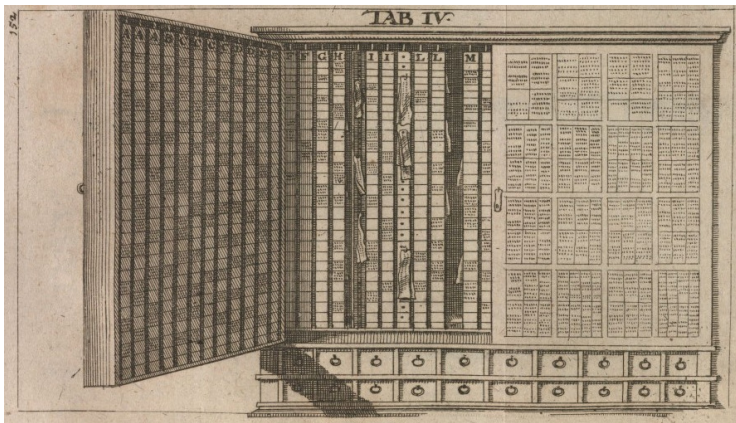


The small "stars" are in fact orbiting around Jupiter, they are doing what the Moon does around the Earth (Wikimedia Commons).

Notes These observations lead Galileo to reject the geocentric hypothesis in favor of the heliocentric one. This brought him much later, and after a somewhat tortuous path that I don't have the space to describe now, in front of the Inquisition that sentences him on June 22 1633 to house arrest, which he remained under for the rest of his life.



## Placcius' and Leibniz' closet



Organizing notes Placcius' way (Placcius, Vincent, 1642-1699. *De arte excerpendi vom gelahrten Buchhalten*, 1689. Houghton Library, Harvard University.)

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└ M1-S1: Note-taking concerns everyone

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Organizing notes Placcius' way (Placcius, Vincent, 1642-1699. *De arte excerpendi vom gelahrten Buchhalten*, 1689. Houghton Library, Harvard University.)

Notes With printing appearance, demand for paper increased and paper's price ended up decreasing (after a large production increase). In addition to the use of the *codex* with pages made of paper, many scholars started using paper slips.

But taking abundant notes on paper slips is good only if one can find efficiently retrieve this stored information when needed. Vincent Placcius (1642-1699) and Gottfried Leibniz (1646-1716) had a custom made closet to solve this retrieval problem. This example is discussed in Ann Blair's book *TOO MUCH TO KNOW*, Yale Univ. Press, 2010 (pp. 93-95).

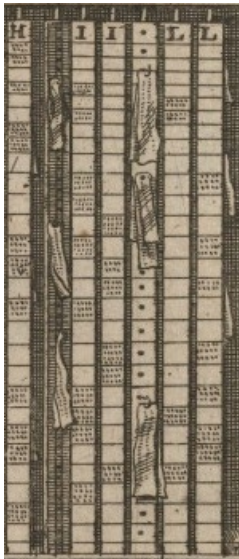
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## Lab books and note books

└ M1-S1: Note-taking concerns everyone



Zoom on the columns of Placcius' cabinet. You can see the "front" (left column), the "side" (second from left) and the "back" (fourth from left).



Zoom on the columns of Placcius' cabinet. You can see the "front" (left column), the "side" (second from left) and the "back" (fourth from left).

Notes This cabinet had many columns that could rotate about their (vertical) axis. The column's front was used to write what we would now call keywords relating to the content of the notes that were hooked on the column's back side.

Notice the advantage of these paper slips over Galileo's codex: with the former, notes can be reorganized.

# Beware of overabundance: Fulgence Tapir's disappearance



In 1908, Anatole France (1844-1924) published "Penguin Island" a parody of French history. By Photographer : Wilhelm Benque. Tucker Collection - New York Public Library Archives, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=16240632>.

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Lab books and note books

└ M1-S1: Note-taking concerns everyone

└ Beware of overabundance: Fulgence Tapir's disappearance

Notes The text can be found *legally* at several places, the Project Gutenberg one is missing the "Preface", so don't use it, go to one of the versions available on Internet Archive: <https://tinyurl.com/MOOC-RR-penguin-island>. The importance of the preface is illustrated by the following two quotations:

*One word more if you want your book to be well received, lose no opportunity for exalting the virtues on which society is based — attachment to wealth, pious sentiments, and especially resignation on the part of the poor, which latter is the very foundation of order. Proclaim, sir, that the origins of property — nobility and police — are treated in your history with the respect which these institutions deserve. Make it known that you admit the supernatural when it presents itself. On these conditions you will succeed in good society.*

And more importantly for our subject:

*The idea occurred to me, in the month of June last year, to go and consult on the origins and progress of Penguin art, the lamented M. Fulgence Tapir, the learned author of the 'Universal Annals of Painting, Sculpture and Architecture'*

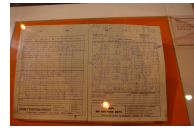
*Having been shown into his study, I found seated before a roll-top desk, beneath a frightful mass of papers, an amazingly short-sighted little man whose eyelids blinked behind his gold-mounted spectacles.*

*To make up for the defect of his eyes his long and mobile nose, endowed with an exquisite sense of touch, explored the sensible world. By means of this organ Fulgence Tapir put himself in contact with art and beauty. It is observed that in France, as a general rule, musical critics are deaf and art critics are blind. This allows them the collectedness necessary for æsthetic ideas. Do you imagine that with eyes capable of perceiving the*

Beware of overabundance: Fulgence Tapir's disappearance



In 1908, Anatole France (1844-1924) published "Penguin Island" a parody of French history. By Photographer : Wilhelm Benque. Tucker Collection - New York Public Library Archives, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=16240632>.



The logbook of Eric Tabarly during the San-Francisco / Tokyo transpacific ocean race in 1969.

# A sailor's logbook

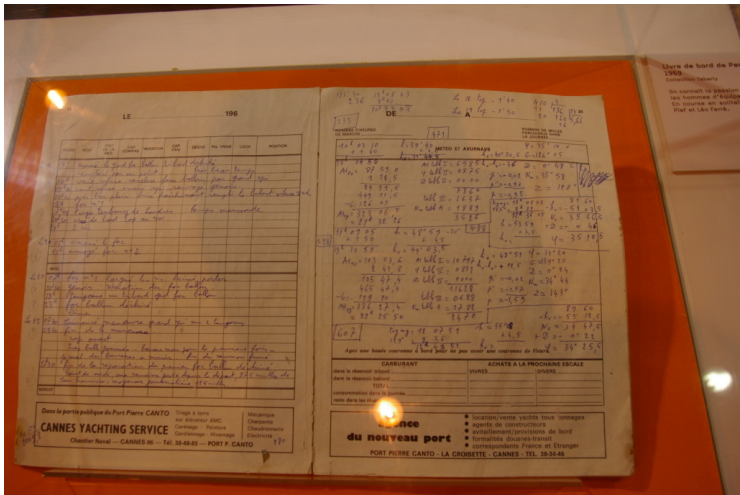
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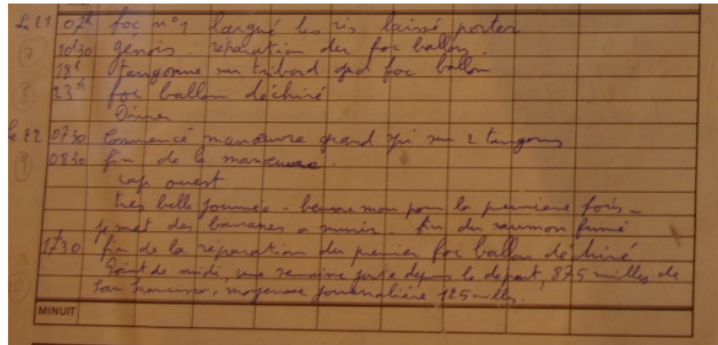
└ M1-S1: Note-taking concerns everyone

└ A sailor's logbook

Notes This example is only superficially anecdotal. Information about the source can be found at: <https://commons.wikimedia.org/wiki/File:LivredebordpenduickV.jpg>.



The logbook of Eric Tabarly during the San-Francisco / Tokyo transpacific ocean race in 1969.



On the left side, Tabarly reports salient events like a ripped jib on March 21 at 11 pm.

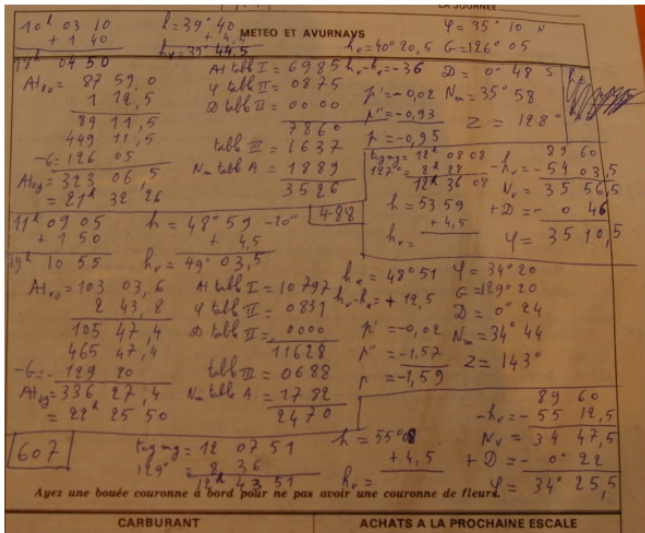
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Lab books and note books

└ M1-S1: Note-taking concerns everyone



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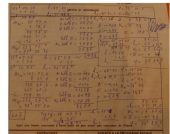


On the right side, he computes his position (that was before GPS time!).

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## Lab books and note books

└ M1-S1: Note-taking concerns everyone



On the right side, he computes his position (that was before GPS time!).

Notes This example is only superficially anecdotal. Ten years ago, a European project was aiming at estimating the Atlantic and Indian Oceans climates during the 18th century using logbooks from ships of the West- and East-India companies from the Kingdoms of Portugal, Spain, Holland, Britain and France. See the [Climatological Database for the World's Oceans 1750-1850](#).

In the same vein, logbooks from slave ships give a lot of quantitative information about the slave trade between Africa and the "New World".

# So, what should we use to take notes?

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└ M1-S1: Note-taking concerns everyone

└ So, what should we use to take notes?

- ▶ The object of study (like the annotated book)?
- ▶ One or several notebooks?
- ▶ Paper slips or cards?
- ▶ Computer files?
- ▶ Drawings, Pictures?
- ▶ Films?
- ▶ ...?

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# Avoid getting lost

Notes generate an organizational problem:

- ▶ How can we structure our notes?
- ▶ Can we index them, if yes, how?
- ▶ How can we archive them while keeping the capability to make them evolve?

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Lab books and note books

└ M1-S1: Note-taking concerns everyone

└ Avoid getting lost

Notes Notes are necessarily heterogeneous—because of their subject matter as well as, often, their material support—and that creates a **serious** organizational problem.

**Without organization, notes usability barely exceeds our capability of memorizing facts and events.**

In the sequel we are going to give *tentative* answers to the questions raised in the last two slides.

Avoid getting lost

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└ M1-S2: Note-taking: a quick history

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# Since note-taking concerns everyone...

- ▶ Since we are all "note-takers", our predecessors were also note-takers.
- ▶ This elementary observation will lead us to "study" how our brilliant ancestors took notes.
- ▶ Hopefully, we can learn some useful techniques on the way and put them to daily use.
- ▶ Hopefully, we can avoid thinking that we are the first to face the kind of problem we are now facing: "information overload".

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└ M1-S2: Note-taking: a quick history

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# What are we going to talk about?

- ▶ The practical aspect of note-taking—what historians dub "materiality"—.
- ▶ The organization of books and notes.
- ▶ The link between the concrete and organizational aspects.

We are going to discuss the organization of books a lot since the "navigation devices" designed for the latter:

- ▶ table of content,
- ▶ index,
- ▶ etc,

also apply to notes.

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Lab books and note books

└ M1-S2: Note-taking: a quick history

└ What are we going to talk about?

Clarification We will mostly refer to the "Western" part of this History, with a single slide on Chinese contributions and nothing on Muslim, Indian or pre-Colombian contributions. This bias must be clearly understood as a **reflection of my ignorance** (I'm actively learning on the subject) and because it's easier, as always, to find illustrative material for "Western" contributions...

What are we going to talk about?

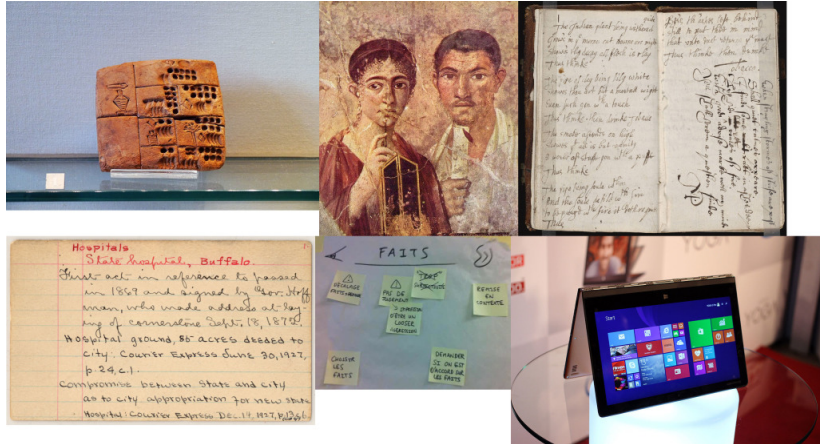
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# The concrete aspects summarized on a single slide



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Lab books and note books

- └ M1-S2: Note-taking: a quick history

- └ The concrete aspects summarized on a single slide



Details All illustrations are taken from Wikimedia Commons

- Top left: A clay tablet (pre-cuneiform period, -3000).
- Top center: A fresco from Pompeii with the portrait of **Terentius Neo and his wife**. She carries a **wax tablet** and a **stylus** (the main medium of note-takers up to the 19th century); he carries a **volumen** or **scroll**, the stuff of books until the beginning of the Common Era.
- Top right: a notebook made of paper from the 17th century with **commonplaces**. "Commonplace" is a translation of the Latin term *locus communis* (from Greek *tópos koinós*, see literary *topos*) which means "a theme or argument of general application", such as a statement of proverbial wisdom (Wikipedia).
- Bottom left: An **index card**, a notes medium whose use exploded with bureaucratization and the development of libraries. Still heavily used in the humanities. Apparently first used (if not created) by the father of taxonomy, **Carl Linneaus**. You can find his cards at: <http://linnean-online.org/61332/#/0>.
- Bottom center: A **Post-it note** as most of us use every day.

# Wax tablet and stylus



Musée romain-germanique  
Cologne (Allemagne)  
Photos de Jacques Poitou

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Lab books and note books

└ M1-S2: Note-taking: a quick history

└ Wax tablet and stylus

Wax tablet and stylus



Musée romain-germanique  
Cologne (Allemagne)  
Photos de Jacques Poitou

Details From the [Wikipedia page](#):

A wax tablet is a tablet made of wood and covered with a layer of wax, often linked loosely to a cover tablet, as a "double-leaved" diptych. It was used as a reusable and portable writing surface in Antiquity and throughout the Middle Ages.

Writing on the wax surface was performed with a pointed instrument, a stylus. Writing by engraving in wax required the application of much more pressure and traction than would be necessary with ink on parchment or papyrus,[1] and the scribe had to lift the stylus in order to change the direction of the stroke. Therefore, the stylus could not be applied with the same degree of dexterity as a pen. A straight-edged, spatula-like implement (often placed on the opposite end of the stylus tip) would be used in a razor-like fashion to serve as an eraser. The entire tablet could be erased for reuse by warming it to about 50 °C and smoothing the softened wax surface. The modern expression of "a clean slate" equates to the Latin expression "tabula rasa".



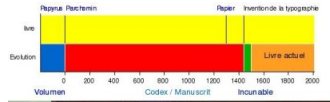
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# Lab books and note books

└ M1-S2: Note-taking: a quick history

└ From the scroll to the codex

# From the scroll to the codex



## Details

The shift from the *scroll* to the *codex* is fundamental for development of written civilization.

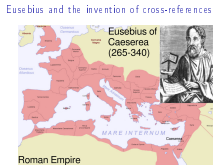
A scroll (from the Old French *escroe* or *escroue*), is a roll of papyrus, parchment, or paper containing writing.

From Wikipedia:

The *codex* was a new format for reading the written word, consisting of individual pages loosely attached to each other at one side and bound with boards or cloth. It came to replace the scroll thanks to several problems that limited the scroll's function and readability. For one, scrolls were very long, sometimes as long as ten meters. This made them hard to hold open and read, a difficulty not helped by the fact that most scrolls in that era were read horizontally, instead of vertically as scrolling virtual documents are read now. The text on a scroll was continuous, without page breaks, which made indexing and bookmarking impossible. Conversely, the codex was easier to hold open, separate pages made it possible to index sections and mark a page, and the protective covers kept the fragile pages intact better than scrolls generally stayed. This last made it particularly attractive for important religious texts.

The bottom left mosaic shows Virgil seating (70-19 BCE) holding a scroll of the *Aeneid*, with Clio, muse of history, also holding a scroll.

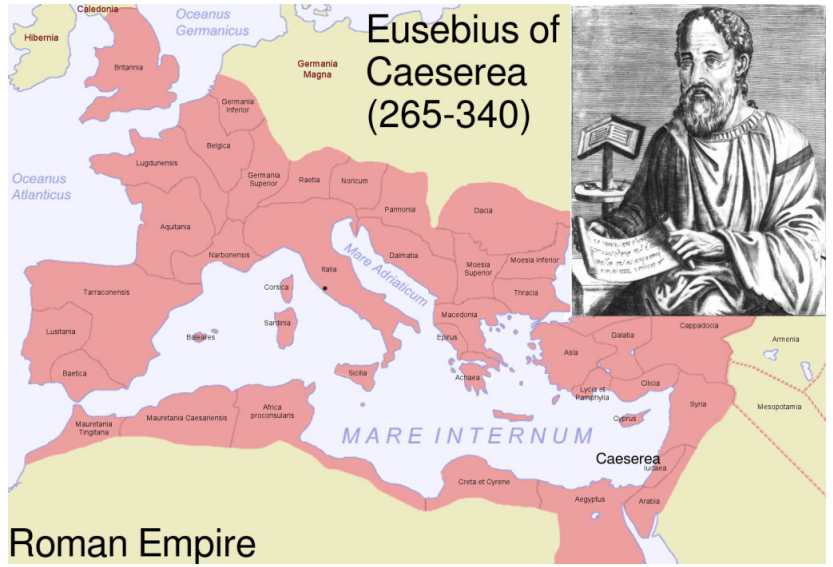
As explained by Frédéric Barbier (*Histoire du Livre*): "The scroll / volumen imposes a complex reading practice: one must unroll (*explicare*) and roll at the same time;



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- Lab books and note books
  - └ M1-S2: Note-taking: a quick history
  - └ Eusebius and the invention of cross-references

# Eusebius and the invention of cross-references



Details Illustrations from Wikimedia Commons.  
 From the Wikipedia page on [Eusebius](#):

*Eusebius of Caesarea (ad 260/265 – 339/340), also known as Eusebius Pamphili, was a historian of Christianity, exegete, and Christian polemicist. He became the bishop of Caesarea Maritima about 314 AD. Together with Pamphilus, he was a scholar of the Biblical canon and is regarded as an extremely learned Christian of his time. He wrote Demonstrations of the Gospel, Preparations for the Gospel, and On Discrepancies between the Gospels, studies of the Biblical text.*

According to Anthony Grafton and Megan Williams (2006) *Christianity and the Transformation of the Book*, The Belknap Press of Harvard University Press, his writings are crucial for our knowledge of the first three centuries of Christian history. *He brought several essential innovations to the book's organization like the cross-references.*

# Eusebian canons



Fol. 10v and 11r of the Egmond Gospels. Canon tables (900 CE).

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└ Eusebian canons

Eusebian canons



Fol. 10v and 11r of the Egmond Gospels. Canon tables (900 CE).

Details Source: [https://commons.wikimedia.org/wiki/File:Fol.\\_10v-11r\\_Egmond\\_Gospels.jpg](https://commons.wikimedia.org/wiki/File:Fol._10v-11r_Egmond_Gospels.jpg). Public Domain.

Quote from Wikipedia:

*For an easier survey of the material of the four Evangelists, Eusebius divided his edition of the New Testament into paragraphs and provided it with a synoptical table so that it might be easier to find the pericopes that belong together. These canon tables or "Eusebian canons" remained in use throughout the Middle Ages, and illuminated manuscript versions are important for the study of early medieval art, as they are the most elaborately decorated pages of many Gospel books.*



# The significance of the *codex*

Following Frédéric Barbier (*HISTOIRE DU LIVRE*, Armand Colin, 2009):

- ▶ The invention of the *codex* is crucial for the development of written civilization.
- ▶ The *codex* lends itself to **consultation reading**.
- ▶ We can add to the *codex* a "navigation system" making consultation easier.
- ▶ We can take notes while consulting a *codex*.
- ▶ The combination of the *codex* with the *Carolingian minuscule* constitutes an extremely powerful intellectual tools, never seen before.

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└ M1-S2: Note-taking: a quick history

└ The significance of the *codex*

The significance of the *codex*

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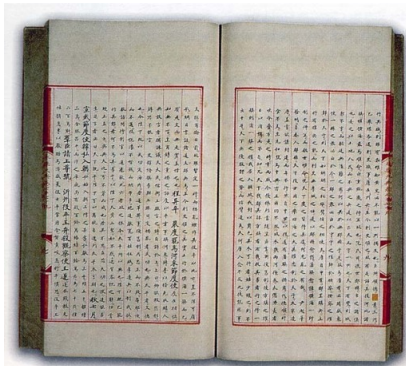
Details Example of *Carolingian minuscule* can be found on the corresponding [Wikipedia page](#).

Over centuries, *codices*—that we often call *manuscripts*—will slowly evolve and gain modern days book attributes:

- separation between words (VIIth century),
- start of punctuation (VIIIth century),
- table of content,
- running title,
- paragraph marks (rubrication, XIth century),
- pagination,
- index (XIIIth century).

An interesting point: Torah's content got "fixed" before the *codex* generalization and today Torah scrolls are still used

# Let us not forget China



En haut : leishu Yongle Dadian (1403) 370 millions de caractères.  
À droite : matrice d'impression de billets de banque  
Dynastie Song du Nord (960-1127).



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Lab books and note books

└ M1-S2: Note-taking: a quick history

└ Let us not forget China

Let us not forget China



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Dynastie Song du Nord (960-1127).

## Details

The link between the *codex* generalization, on the one hand, and the apparition of "navigation guides" like the table of content, the index, the running title, on the other hand as a counterpart in the Chinese civilization.

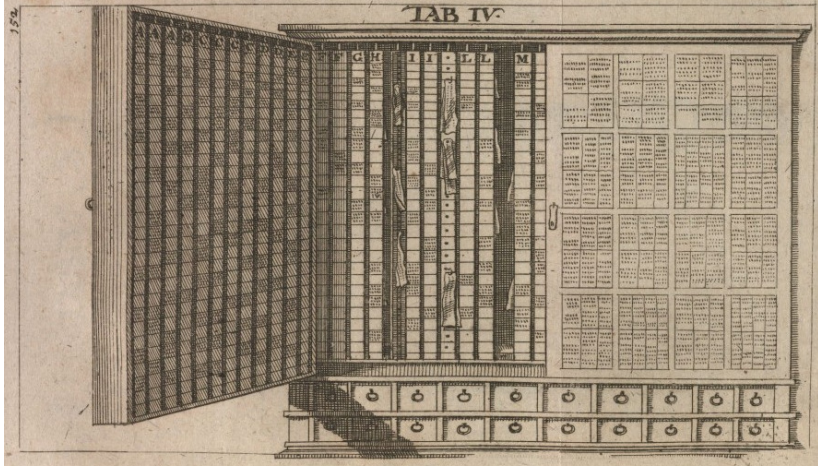
In China, competitive examinations to become a high ranking state employee developed in the IXth century (CE). The main part of these exam was a paper on what we would now call general knowledge of the Classics where the students were asked to demonstrate their knowledge through appropriate quotations.

To fulfill the need of "textbook" appropriate for this kind of examination what is called **leishu** were produced. They are described as follows on Wikipedia:

*The leishu are composed of sometimes lengthy citations from other works and often contain copies of entire works, not just excerpts. The works are classified by a systematic set of categories, which are further divided into subcategories. Leishu may be considered anthologies, but are encyclopedic in the sense that they may comprise the entire realm of knowledge at the time of compilation.*

The efficient use of the leishu requires an indexing system, a table of content, etc. Very interestingly, the scroll will be abandoned and the codex will generalize in China around the 10th century. **Too much to know, too much to know.**

# Getting organized by using the right slot



Placcius' closet again (Placcius, Vincent, 1642-1699. *De arte excerptendi vom gelahrten Buchhalten*, 1689. Houghton Library, Harvard University.)

2018-09-03

Lab books and note books

└ M1-S2: Note-taking: a quick history

└ Getting organized by using the right slot



Placcius' closet again [Placcius, Vincent, 1642-1699. *De arte excerptendi vom gelahrten Buchhalten*, 1689. Houghton Library, Harvard University.]

## Details

Now that we briefly reviewed the timeline of the main navigation elements of the books—navigation elements that can of course be applied to our lab/note-books—we come back to the paper slips and cards as notes media.

We see (again) Placcius' and Leibniz's closet since it displays both the benefits and the shortcomings of media that hold a **single note**.

Obvious shortcomings are:

- Paper slips and cards get easily lost.
- They are essentially useless if they are not **classified** in addition to being filed.

These problems are solved by Placcius' cabinet, the content of which is fundamentally accessed through the index.

Clear benefits are:

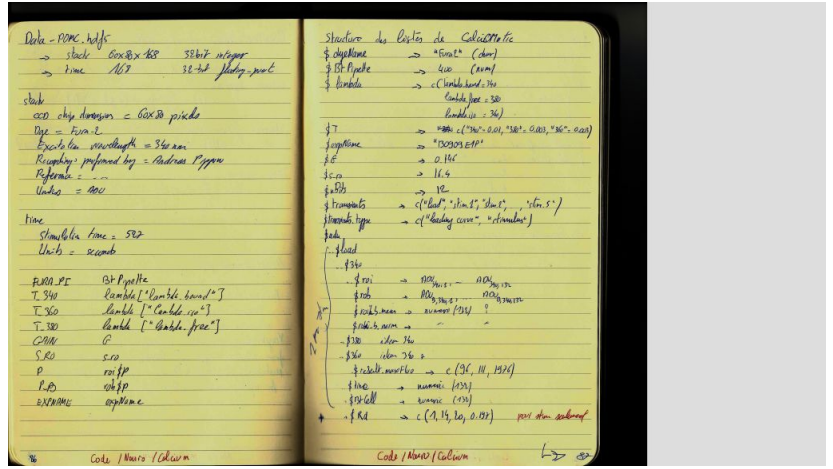
- Paper slips can be easily reorganized when they contain information on several subjects.
- Paper slips can be directly pasted in a book when composing an anthology or a compendium.

This last technique (pasting when making an anthology) was systematically used by



My own notebook is used here for illustration.

# Constructing a notebook index the John Locke way



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## Lab books and note books

└ M1-S2: Note-taking: a quick history

└ Constructing a notebook index the John Locke way

Details We will now learn about an index construction technique due to **John Locke** (1632-1704), the grand-father of liberalism and a major investor in the *Royal African Company*, the largest company in the **slave-trade** business at that time...

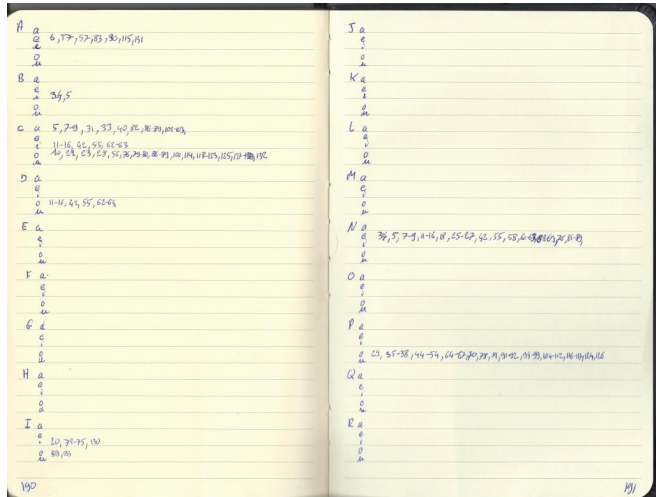
The indexing method is here illustrated using my own notebook. The two pages that are displayed describe the structure of a dataset in the **HDF5** format on the left side and the corresponding structure (designed to map the former one) of a data frame object of the **R** language. This dataset contain **calcium** concentration measurements made in **neurons**. This notes were taken while writing some computer **code** to analyze the data. The precise content of the pages does not matter here in order to understand how Locke's method works. The important points are:

- The pages are numbered (we are seeing here pages 86 and 87).
- Keywords are written at the bottom of the page: **code**; **neuro**; **calcium**.

My own notebook is used here for illustration.

This method can be applied after note-taking, you just need to have few pages left at the end of your notebook. That's in fact what I did since I had started filling my notebook before learning about the method (I learned about while preparing the French version of this lecture last September).

# Locke's method continued



The last pages of my notebook with the index.

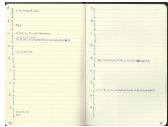
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Lab books and note books

└ M1-S2: Note-taking: a quick history

└ Locke's method continued

Locke's method continued



The last pages of my notebook with the index.

## Details

We know the index. It is located at the end of the notebook although Locke recommends placing it at the beginning. Since I did not know about the method when I started the notebook, I had to place it at the end...

The idea is to enter the keywords used in the notebook based on their **first letter** and the **first vowel following the first letter**.

The index is therefore made of the 26 letters (you see letters "A" to "R" here, the remaining ones are on the next page) subdivided the five most common vowels ("y" goes together with "i" in that case).

Pages 86 and 87 contained the keyword **code** that goes into the entry "Co" of the index (you see "86-89" because the following pages also concern code for the same project).

The keyword **Neuro** giving an entry on line "Ne", while the keyword **Calcium** gives an entry on line "Ca".

The keyword **Criquet** (not shown above) gives an entry on line "Ci".

It is also a good idea to list the set of keywords used in the notebook on the page preceding or following the index.

# Conclusions of the historical overview

Since it is hard (for me at least) to use paper as a medium for note-taking, learning from "Newton's giants" should save us from reinventing the wheel (and getting it square).

We should nevertheless use digital media as much as possible (while keeping in mind what we just learned) since they provide:

- ▶ more organizational and structural flexibility,
- ▶ reliable archiving tools,
- ▶ powerful indexing tools.

2018-09-03

Lab books and note books

└ M1-S2: Note-taking: a quick history

└ Conclusions of the historical overview

Conclusions of the historical overview

Since it is hard (for me at least) to use paper as a medium for note-taking, learning from "Newton's giants" should save us from reinventing the wheel (and getting it square).

We should nevertheless use digital media as much as possible (while keeping in mind what we just learned) since they provide:

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- ▶ powerful indexing tools.

# Where are we?

M1-S0: Lab books and note books

M1-S1: Note-taking concerns everyone

M1-S2: Note-taking: a quick history

M1-S3: From text files to lightweight markup languages

M1-S4: Notes (and codes) that are archived but can evolve with version control systems

M1-S5: Finding one's way with tags and desktop search application

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Lab books and note books

└ M1-S3: From text files to lightweight markup languages

└ Where are we?

Section introduction We now start the "technical" part of this lecture with the tools that computers provide for note-taking like **text files** and **lightweight markup languages**.

Where are we?

M1-S0: Lab books and note books

M1-S1: Note-taking concerns everyone

M1-S2: Note-taking: a quick history

M1-S3: From text files to lightweight markup languages

M1-S4: Notes (and codes) that are archived but can evolve with version control systems

M1-S5: Finding one's way with tags and desktop search application

# What is a *text file* or *text format*?

- ▶ From a practical point of view, a **text files** gives *something readable* when opened with a **text editor**.
- ▶ A **text editor** enables us to create and modify text files (nice circular definition!). It's a software like:
  - ▶ **Notepad++** for Windows,
  - ▶ **gedit** for Unix/Linux systems (but it also runs on the other two),
  - ▶ **TextEdit** for MacOS.
- ▶ I'm mentioning only open source software since it is hard to do genuinely reproducible research with anything else.
- ▶ A **word processor** is more sophisticated than a *text editor*.
- ▶ **Warning** the native format used by word processors is rarely a *text format*. Word's doc and docx files and Libreoffice odt files *are not text files*.

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Lab books and note books

└ M1-S3: From text files to lightweight markup languages

└ What is a *text file* or *text format*?

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- ▶ A **word processor** is more sophisticated than a *text editor*.
- ▶ **Warning** the native format used by word processors is rarely a *text format*. Word's doc and docx files and Libreoffice odt files are not text files.



# Example of a file that cannot be read with a text editor

```
%PDF-1.5
17 0 obj
<<
/Length 1688
/Filter /FlateDecode
>>
stream
xIWI AP 0B 0E EF AF FFA2 X\ve |D9< D1 CB AC C6 80 VA I v |BF AD C4 Cq AC s 9A VFE (FA 91 A2 94 gn0 ) B $
|BA VA4 (~ CA LuX |B1 D5 EF CF D8 8E VAP B7 CF VFC 96 B8 C2 E2 0 C4 |B8 V F1 AC 88 K6 Vyu |C6 92 VAP B6 ED EA C F6 q |FD A0 B5 C3 : 93 fe |A4 |F9 V9
|EF AEG C2 |89 03 0 F0 BE |8D 93
[mR |5 9E D1 qo |B4 0 |A8 0 90 S1 |FD B N AA H0 | 8B AA B7 7 U |BA D sU |9C 96 | 89 BC 95 B8 - EE E4 -< XFF |1 94 0 |DC |CF n |8F DF V0 AC BC y |
|95 8 53 D1 0 F B B2 D5 X X D1 E4 P CA E2 BA U |952 00 M C4 Y D0 C6 D7 | CE |FD 1 04 |C X B5 |DF
|88 |AC nR |9ep |8F |E 7 |80 DF | 8C 0 B 98 97 | \ |80 F3 AC F2 V C4 Y | 80 -t |E 0 H |E 7 |C 8 |Gp |F1 A8 C C4 - |DS VC 04 |NEE V5 C C |000 |B2 (^ o c?
0 |EA C 7 |98
wVs C2 V2 VAP X |F5 BF 90 E1 90 | 99 Y E5 E5 5 |9 8 B 0 EF 8 F5 | E q \D |2 # |87 -Kob |82
}H |A0 B2 94 VAP AD E5 |F2 |86 C1 CD V B B |? |A4 88 93 |+
|87 C7 |E k |F B D5 B0 V F |88 m u |83 C B C2 N0 96 A5 B8 | 96 5 | |AS B7 B8 | 92 | 94 | 9C | 9E V F G AC V A C |T |C 8 |DA VPS AA q
|BC 84 AB AD V B C2 |A1 L V |80 E8 0A |CF 5 |8F |2 |82 9D F4 A8 06 94 99 CF PA 92 v |D3 |f : u |82 $ R D6 C8 |8F |C 1 + Xx * :
9E A5 B3 0 BE B2 B8 Y C 7 |
|D7 ED Y |B2 B8 |A2 88 Y | 80 |ED D8 |w9 | 8E B2 h 3 |9C 87 |A2 | |BF A4 A0 | 8A 8A |C 2 |U 97 V D | |86 | 8F V P !
Y |8F 03 |EC F5 E0 |D1 A9 8E n |87 B
|85 94 DF V |A6 D9 D0 LE |G |T |b |E1 E8 C1 |A1 B 8 S M G A8 5 90 B3 |k + |Z 92 A |B3 V E8 9A |EE C7 D8 |A4 0 |D8 N0 |87 C e z T
|86 B C |BE 96 #e 5 |87 D0 e T |F9 |F6 9 h : t C7 C5 | 98 A5 C8 |C2 e P |F3 z | : A9 BC 96 |EF D3 D2 V C A D |T |A7 E H A |e = |C1 B E V A 8 E 2 U
|EE A4 8 |82 C 7 K RE DC |8F 85 |E 7 |P 8 F P | 8A A4 A F |D6 |F 7 D6 C 9 9 0 90 82 C EA C1 D8
A3 A9 EC C8 58 |8c |900 A P |M # |A6 B3 |EE CF 2 |# B A F ED V C |86 B5 8 F |8F 3 |E ER |80 E 4 B |E 4 X T |P B D E |A4 E 1 |E F A1 V P |M C |E 5 u 7
F 5 D h A 5 0 87 C 1 F 3 B 8 + C id 94 u A F BE |d /> |E 3 9 a ?
w |86 |5 |88 |C 8 D 0 A 0 X |84 | 9 C C X u t U + * s |82 |B 2 C1 95 |q Y |A R Y |ED C 0 90 |D1 Z M |A 8 V C A C 9 |9 * w b P |B 2 0 0 |82 DC E 8 0 n \ t |w |88
|A 0 |E1 F 6 90 |9C 90 |D6 < s |E 0 Y 9 A C F |9C F 6 B 2 n 00 |F4 E L C F |O H 8 E 8 |D 9 D |8B 90 m |C 8 D E |D 8 |3 |A F |A k 5
< |J X 0 0 C D 0 7 F |A F |B 4 B 8 y 7 |90 F 3 9 A E C | 91 D C 0 W C 0 D 6 |1 |L A Y |C 8 I k x s |F 2 8 0 E 6 |h : |88 |F D 1 |
H |F B 98 |E 5 94 |9 4 B D 8 C 8 8 E 0 D 2 F D 8 5 D 6 0 3 D 0 C A F 1 A 0 B D I T 5 w |C 9 E 5 F 3 D 8 D 2 3 |8 C D 8 |
|A 5 |A 2 B 9 8 7 P |98 |B 2 B 3 |C B C F |A 3 C E 0 8 0 C V 7 | : -
|C H I |E n C |F a p a d |C 0 8 0 Y |D 5 |E B A 9 |A F |u |C E | |8 E E D E D V 6 B 1 E 1 B A E F D 0 F A 5 E B B A |V |X 5 B |F 4 C 4 |D 4 0 E |1 |88 |8 5 B 4 x p q !
```

A pdf file (the file shown right now with a pdf reader) opened with gedit.

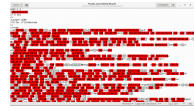
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Lab books and note books

└ M1-S3: From text files to lightweight markup languages

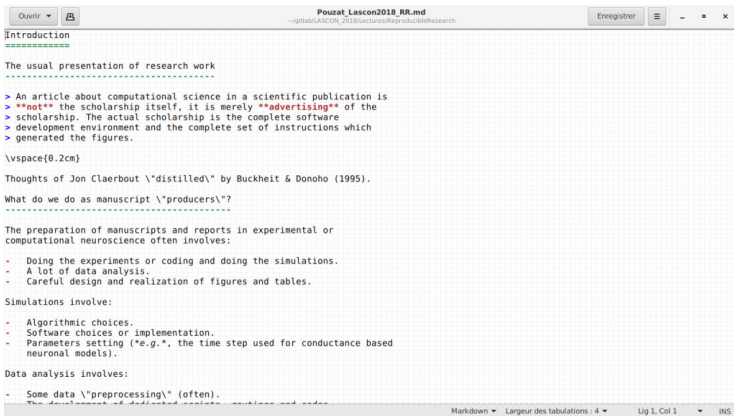
└ Example of a file that cannot be read with a text editor

Example of a file that cannot be read with a text editor



A pdf file (the file shown right now with a pdf reader) opened with gedit.

# A text file opened with a text editor



The screenshot shows a text editor window titled "Pouzat\_Lascon2018\_RR.md". The content of the file is as follows:

```
Introduction
-----

The usual presentation of research work
-----

> An article about computational science in a scientific publication is
> not the scholarship itself, it is merely advertising of the
> scholarship. The actual scholarship is the complete software
> development environment and the complete set of instructions which
> generated the figures.

\vspace{0.2cm}

Thoughts of Jon Claerbout \`distilled\` by Buckheit & Donoho (1995).

What do we do as manuscript \`producers\`?
-----

The preparation of manuscripts and reports in experimental or
computational neuroscience often involves:

- Doing the experiments or coding and doing the simulations.
- A lot of data analysis.
- Careful design and realization of figures and tables.

Simulations involve:

- Algorithmic choices.
- Software choices or implementation.
- Parameters setting (*e.g.*, the time step used for conductance based
neuron models).

Data analysis involves:

- Some data \`preprocessing\` (often).
  The development of dedicated scripts, routines and codes
```

A markdown file (a source file for this lecture) opened with gedit.

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Lab books and note books

└─ M1-S3: From text files to lightweight markup languages

└─ A text file opened with a text editor

A text file opened with a text editor



A markdown file (a source file for this lecture) opened with gedit.

Characters contained in text files are now typically encoded in UTF-8.  
This implies that:  
▶ It is "always" possible to read these files with a text editor even years after their creation.  
▶ Desktop search and version control software work very efficiently with them.  
Unless you run into serious memory problems, use text files, always.

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Lab books and note books

└ M1-S3: From text files to lightweight markup languages

└ Why should we use text files?

# Why should we use text files?

Characters contained in text files are now typically encoded in UTF-8.

This implies that:

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Unless you run into serious memory problems, use text files, always.

# Problems with simple text files

- ▶ The "simple" text file precludes the use of nice navigation tools like **hyperlinks**.
- ▶ It is not possible to emphasize a word with a **bold** or an *italic* font.
- ▶ If several persons work on the same text, they can't correct each other by ~~striking through~~ text.

These limitations, combined with the benefits of text files, led computer scientists to develop **markup languages**.

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Lab books and note books

└ M1-S3: From text files to lightweight markup languages

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Wikipedia HTML page viewed with qutebrowser web browser.

Lab books and note books

- └ M1-S3: From text files to lightweight markup languages

- └ A trivial example is the HTML language.

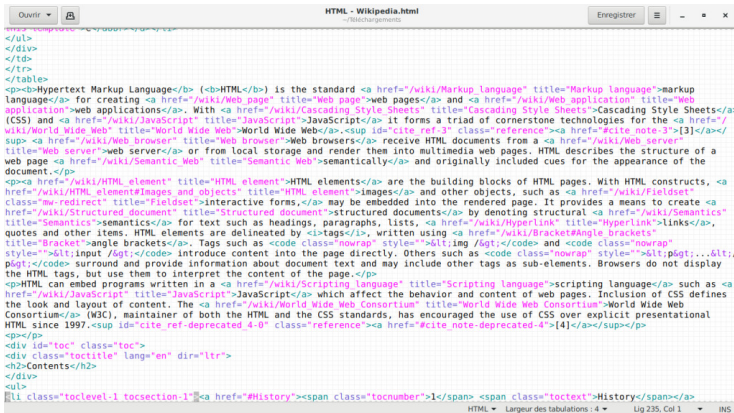
2018-09-03

 A screenshot of a terminal window titled 'HTML - Wikipedia - qutebrowser'. The terminal shows the rendered Wikipedia page for HTML. The page includes the Wikipedia logo, navigation links, and the main article content. A 'Contents' table is visible on the left side of the article. On the right side, there is a 'HTML (Hypertext Markup Language)' box containing a code snippet of an HTML document structure and a table of technical details.
 

<b>Filename extension</b>	.html .hta
<b>Internet media type</b>	text/html
<b>Type code</b>	TEXT
<b>Developed by</b>	W3C & WHATWG
<b>Initial release</b>	1993: 25 years ago
<b>Latest release</b>	5.1 2nd Edition <sup>[1]</sup> 5.2 (working draft) <sup>[2]</sup> (1 November 2016; 14

Wikipedia HTML page viewed with qutebrowser web browser.

# An HTML file opened with a text editor



```
Ouvrir HTML - Wikipedia.html Enregistrer - = x  
</ul>  
</div>  
</td>  
</tr>  
</table>  
</b>Hypertext Markup Language (HTML) is the standard language for creating web pages and web applications. With Cascading Style Sheets (CSS) and JavaScript it forms a triad of cornerstone technologies for the World Wide Web. World Wide Web browsers receive HTML documents from a web server or from local storage and render them into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.  
<p>HTML elements are the building blocks of HTML pages. With HTML constructs, images and objects, such as forms, may be embedded into the rendered page. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, and other items. HTML elements are delineated by tags, written using angle brackets. Tags such as <img /> and <input /> introduce content into the page directly. Others such as <img /> surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page.  
<p>HTML can embed programs written in a scripting language such as JavaScript which affect the behavior and content of web pages. Inclusion of CSS defines the look and layout of content. The World Wide Web Consortium (W3C), maintainer of both the HTML and the CSS standards, has encouraged the use of CSS over explicit presentational HTML since 1997.  
<div id="toc" class="toc">  
<div class="toctitle" lang="en" dir="ltr">  
<h2>Contents</h2>  
</div>  
<ul>  
<li class="toclevel-1 tocsection-1"><a href="#History"><span class="tocnumber">1</span> <span class="toctext">History</span></a>
```

The Wikipedia HTML page opened with gedit. Markup languages were not designed to be read by humans.

2018-09-03

Lab books and note books

- ↳ M1-S3: From text files to lightweight markup languages

- ↳ An HTML file opened with a text editor

An HTML file opened with a text editor



The Wikipedia HTML page opened with gedit. Markup languages were not designed to be read by humans.

Note The content of files written with a markup language are typically processed by a dedicated software like a web browser or converted into a format for which readers are available like LaTeX files that get "compiled" into PDF files.

If you look carefully the last figure, you can find the text of the first main paragraph of the previous figure.

## └ M1-S3: From text files to lightweight markup languages

We can summarize our problem as follows:

- ▶ Text files are attractive for note-taking.
- ▶ Markup languages provide a much better "reading experience" when viewed with the proper "browser".
- ▶ Markup language files are text files, **but** usually require dedicated editing software if we want to modify them.

Is it possible to combine the benefits of "simple" text files with the reading comfort of markup languages?

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Is it possible to combine the benefits of "simple" text files with the reading comfort of markup languages?

A lightweight markup language is:

- ▶ A markup language with a **simple syntax**.
- ▶ A language designed to be **easily edited** with a text editor.
- ▶ A language **easily read** without a browser.

# Lightweight markup languages: the idea

2018-09-03

Lab books and note books

└ M1-S3: From text files to lightweight markup languages

└ Lightweight markup languages: the idea

A **lightweight markup language** is:


- ▶ A *markup language* with a **simple syntax**.
- ▶ A language designed to be **easily edited** with a *text editor*.
- ▶ A language **easily read** without a browser.





The syntax basics from [Wikipedia](#), see also "Mastering Markdown" (a 3 min read) from [GitHub](#).

# Markdown as an example

Text using Markdown syntax	Corresponding HTML produced by a Markdown processor	Text viewed in a browser
Heading ===== ## Sub-heading Paragraphs are separated by a blank line. Two spaces at the end of a line leave a line break. Text attributes <i>italic</i> , <b>bold</b> , <code>monospace</code> . Horizontal rule: --- Bullet list: * apples * oranges * pears Numbered list: 1. wash 2. rinse 3. repeat A <a href="http://example.com">link</a> . ![Image](image_icon.png) > Markdown uses email-style > characters for blockquoting.	<pre>&lt;h1&gt;Heading&lt;/h1&gt; &lt;h2&gt;Sub-heading&lt;/h2&gt; &lt;p&gt;Paragraphs are separated by a blank line.&lt;/p&gt; &lt;p&gt;Two spaces at the end of a line&lt;br /&gt;leave a line break.&lt;/p&gt; &lt;p&gt;Text attributes &lt;em&gt;italic&lt;/em&gt;, &lt;strong&gt;bold&lt;/strong&gt;, &lt;code&gt;monospace&lt;/code&gt;.&lt;/p&gt; &lt;p&gt;Horizontal rule:&lt;/p&gt; &lt;hr /&gt; &lt;p&gt;Bullet list:&lt;/p&gt; &lt;ul&gt; &lt;li&gt;apples&lt;/li&gt; &lt;li&gt;oranges&lt;/li&gt; &lt;li&gt;pears&lt;/li&gt; &lt;/ul&gt; &lt;p&gt;Numbered list:&lt;/p&gt; &lt;ol&gt; &lt;li&gt;wash&lt;/li&gt; &lt;li&gt;rinse&lt;/li&gt; &lt;li&gt;repeat&lt;/li&gt; &lt;/ol&gt; &lt;p&gt;A &lt;a href="http://example.com"&gt;link&lt;/a&gt;.&lt;/p&gt; &lt;p&gt;&lt;img alt="Image" src="image_icon.png" /&gt;&lt;/p&gt; &lt;blockquote&gt; Markdown uses email-style &gt; characters for blockquoting. &lt;/blockquote&gt;</pre>	Heading Sub-heading Paragraphs are separated by a blank line. Two spaces at the end of a line leave a line break. Text attributes <i>italic</i> , <b>bold</b> , <code>monospace</code> . Horizontal rule: Bullet list: * apples * oranges * pears Numbered list: 1. wash 2. rinse 3. repeat A <a href="#">link</a> .  Markdown uses email-style > characters for blockquoting.

The syntax basics from [Wikipedia](#), see also "Mastering Markdown" (a 3 min read) from [GitHub](#).

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Lab books and note books

└─ M1-S3: From text files to lightweight markup languages

└─ Markdown as an example

Among the "most popular":  
▶ **MediaWiki** used by Wikipedia (but files are not stored in text format!).  
▶ **DokuWiki** like MediaWiki but stored in text format.  
▶ **reStructuredText** used for the **python** documentation.  
▶ **AsciiDoc**.  
▶ **Org mode**, my favorite, but it requires learning **emacs** (a good thing to do, if you have time for it).  
The good news is that you don't need to be too nervous about choosing the "right" language, thanks to **pandoc** you can convert one into any other!

2018-09-03

## Lab books and note books

└ M1-S3: From text files to lightweight markup languages

└ Markdown is not the only lightweight markup language

# Markdown is not the only lightweight markup language

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- ▶ **AsciiDoc**.
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The good news is that you don't need to be too nervous about choosing the "right" language, thanks to **pandoc** you can convert one into any other!

# Summary of this section

Thanks to lightweight markup languages we will be able to:

- ▶ Work mostly with text files.
- ▶ Write our notes quickly with any editor.
- ▶ Organize our notes.

2018-09-03

Lab books and note books

└─ M1-S3: From text files to lightweight markup languages

└─ Summary of this section

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Thanks to lightweight markup languages we will be able to:

- ▶ Work mostly with text files.
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# Where are we?

M1-S0: Lab books and note books

M1-S1: Note-taking concerns everyone

M1-S2: Note-taking: a quick history

M1-S3: From text files to lightweight markup languages

**M1-S4: Notes (and codes) that are archived but can evolve with version control systems**

M1-S5: Finding one's way with tags and desktop search application

2018-09-03

Lab books and note books

└ M1-S4: Notes (and codes) that are archived but can evolve with version control systems

└ Where are we?

Where are we?

M1-S0: Lab books and note books

M1-S1: Note-taking concerns everyone

M1-S2: Note-taking: a quick history

M1-S3: From text files to lightweight markup languages

**M1-S4: Notes (and codes) that are archived but can evolve with version control systems**

M1-S5: Finding one's way with tags and desktop search application

# Introduction of this section

- ▶ The tools we are going to discuss should appeal to a much wider audience than the reproducible research community.
- ▶ Anyone working with text is concerned, even more so when this work is done in collaboration.
- ▶ **The longevity issue of notes and texts is in no way new.**
- ▶ The humanists and scholars of the early modern period who specialized in text compilations were literally obsessed by this problem and used it to justify their work.
- ▶ Their solution was to use multiple copies, as we now do with a different medium.
- ▶ We should nevertheless remain humble, the paper (and parchment) medium used by humanists has demonstrated its capability to last.
- ▶ When it comes to making notes evolve, I think we can say that some real progress was recently made.

2018-09-03

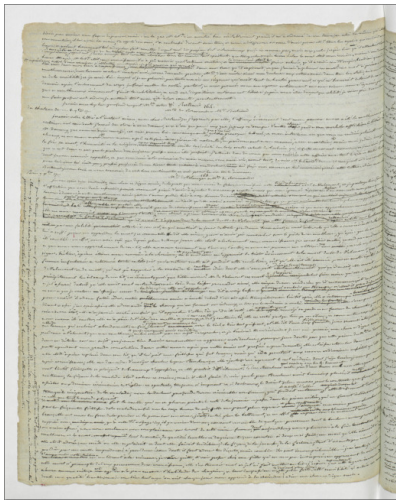
## Lab books and note books

- └ M1-S4: Notes (and codes) that are archived but can evolve with version control systems
  - └ Introduction of this section

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# The nightmare: changing a text on paper medium

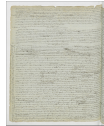


Manuscript of *Dangerous Liaisons* (*Les liaisons dangereuses*) by Pierre Choderlos de Laclos (p. 258, BNF Gallica).  
There is clearly a very limited number of changes one can bring in that way!

2018-09-03

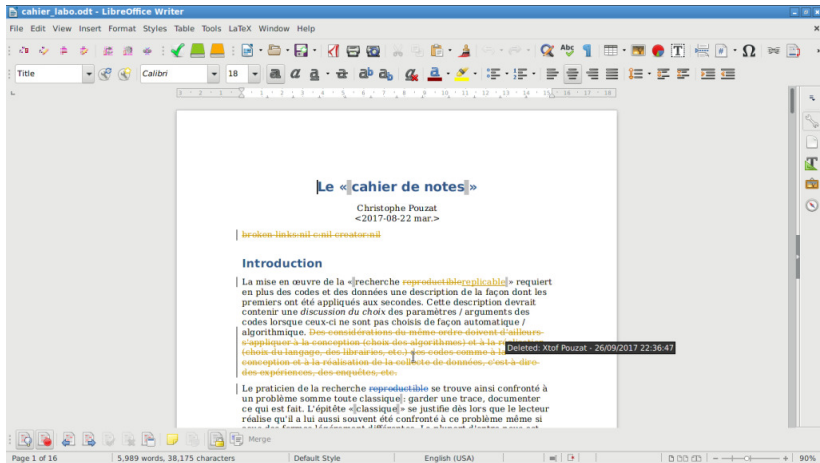
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- └ M1-S4: Notes (and codes) that are archived but can evolve with version control systems
- └ The nightmare: changing a text on paper medium



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# Changing a text with a word processor



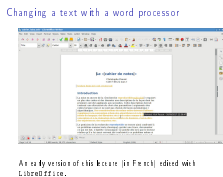
An early version of this lecture (in French) edited with LibreOffice.

2018-09-03

Lab books and note books

└ M1-S4: Notes (and codes) that are archived but can evolve with version control systems

└ Changing a text with a word processor



Details We see a way of working in collaboration on a text: most word processing software have a way to follow changes brought to the text.

This is not the solution I recommend but this is probably the most widely known concurrent version facility.

Notice the buttons at the bottom left. They appear when you navigate in view -> Toolbars -> track changes.

This "solution":

- is easy to implement,
- *does not generate text files*
- does not take care of archiving the files.



The personal wiki using the **dokuwiki** engine | Experience need while preparing the French version of this lecture.

2018-09-03

Lab books and note books

└ M1-S4: Notes (and codes) that are archived but can evolve with version control systems

└ Making change with a "wiki engine"

Details I started using **dokuwiki** for this lecture, it is therefore simple enough to learn.

Dokuwiki uses a test format.

# Making change with a "wiki engine"

jeté, car il peut être nécessaire pour expliquer des données antérieures, considérées ultérieurement comme étranges. [...]

Le but de toute cette pratique de prise de notes est de préserver la valeur [le temps et les moyens humains et matériels investis dans la recherche]. Elle devrait être soigneusement conçue pour s'adapter aux conditions de chaque laboratoire et devraient être adéquate mais pas trop élaborés. Si l'on exige trop de la nature humaine, le système ne fonctionnera pas.

## Histoire

- Une carte des provinces romaines, la référence est « CC BY-SA 3.0. <https://commons.wikimedia.org/w/index.php?curid=2249662> » ;
- Césarée (Wikipédia) ;
- Moulin à maillets de l'Encyclopédie de Diderot et d'Alembert ;
- Moulin à maillets de « L'ART DE FAIRE LE PAPIER » de sur le site du Moulin du Verger.
- Canon eusébien (Wikipédia), un exemple avec 4 colonnes (Domaine public, <https://commons.wikimedia.org/w/index.php?curid=108009>), Évangélaire de Lorsch. 778—820. canon I. et un autre avec 3 (Domaine public, <https://commons.wikimedia.org/w/index.php?curid=108011>) Évangélaire de Lorsch canon II. Un portrait d'Eusébe : Domaine public, <https://commons.wikimedia.org/w/index.php?curid=643569> ;
- Un numéro hors série de « Extrême-Orient, Extrême-Occident » sur « Qu'étaient-ce qu'écrire une encyclopédie en Chine ? » ;
- Book Culture and Textual Transmission in Sung China, un article de Susan Cherniack cité par Ann Blair (p 31) à propos du lien entre matérialité du livre (passage du rouleau au codex) et « l'explosion » des leishu dans la Chine du 9e siècle ;
- Un article (en anglais) sur les common place book dans Wikipedia ;
- Indexing commonplace books: John Locke's method de Alan Walker ([PDF annoté](#)) ;
- Exemple de John Locke ; sur Locke, « papa du libéralisme » et actionnaire de la *Royal African Company* principale compagnie négrière britannique, voir l'article de Wikipedia en anglais, Philip D. Curtin *The Atlantic Slave Trade: A Census* (University of Wisconsin Press, 1969, p. 121-123), l'article de Wikipedia en français sur le bonhomme et « Contre-histoire du libéralisme » de Domenico Losurdo (La Découverte / Poche, 2014, p. 34-36) ;
- les fiches de Linnée ;

les\_notes\_sur\_le\_cahier\_de\_notes.txt · Dernière modification: 2017/10/01 16:47 par xtof

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[Ajouter un fichier](#)
[Ajouter un modèle](#)
[Ajouter un template](#)

http://localhost/dokuwiki/doku.php?id=les\_notes\_sur\_le\_cahier\_de\_notes#histoire  
 Link: <https://commons.wikimedia.org/w/index.php?curid=2249662>

16:29 (100, 100)

The personal wiki (using the **dokuwiki** engine) I experienced while preparing the French version of this lecture.



les\_notes\_sur\_le\_cahier\_de\_notes - Anciennes révisions [Notes] - Conkeror

## Anciennes révisions

Voici les anciennes révisions de la page en cours. Pour revenir à une ancienne révision, sélectionnez-la ci-dessous, cliquez sur le bouton « Modifier cette page » et enregistrez-la.

- 2017/10/07 08:20 les\_notes\_sur\_le\_cahier\_de\_notes – [Prise de notes] xtof +12 B (Version actuelle)
- 2017/10/06 17:59 les\_notes\_sur\_le\_cahier\_de\_notes – [Prise de notes] xtof (127.0.0.1) +948 B
- 2017/10/01 16:47 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +98 B
- 2017/10/01 16:32 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +95 B
- 2017/10/01 15:47 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +99 B
- 2017/09/30 14:09 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +584 B
- 2017/09/30 13:20 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +101 B
- 2017/09/30 11:08 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +2 B
- 2017/09/29 20:56 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +6 B
- 2017/09/29 20:25 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +49 B
- 2017/09/29 20:08 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +216 B
- 2017/09/29 19:55 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +123 B
- 2017/09/29 18:03 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +363 B
- 2017/09/29 17:15 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +238 B
- 2017/09/29 14:49 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +534 B
- 2017/09/29 14:27 les\_notes\_sur\_le\_cahier\_de\_notes – [Histoire] xtof (127.0.0.1) +294 B
- 2017/09/29 13:11 les\_notes\_sur\_le\_cahier\_de\_notes xtof (127.0.0.1) +212 B
- 2017/09/27 09:01 les\_notes\_sur\_le\_cahier\_de\_notes xtof (127.0.0.1) +521 B
- 2017/09/25 10:07 les\_notes\_sur\_le\_cahier\_de\_notes xtof (127.0.0.1) +4 B
- 2017/09/24 21:33 les\_notes\_sur\_le\_cahier\_de\_notes – créée xtof (127.0.0.1) +415 B

Différences entre les versions sélectionnées

les\_notes\_sur\_le\_cahier\_de\_notes.txt · Dernière modification: 2017/10/07 08:20 par xtof

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http://localhost/dokuwiki/doku.php?id=les\_notes\_sur\_le\_cahier\_de\_notes&do=revisions 15:47 (100, 78)

Done [form:checkbox](#)

Clicking *previous versions* (*anciennes révisions*) gives access to the list of changes done when and by whom. If I now select two versions. . .

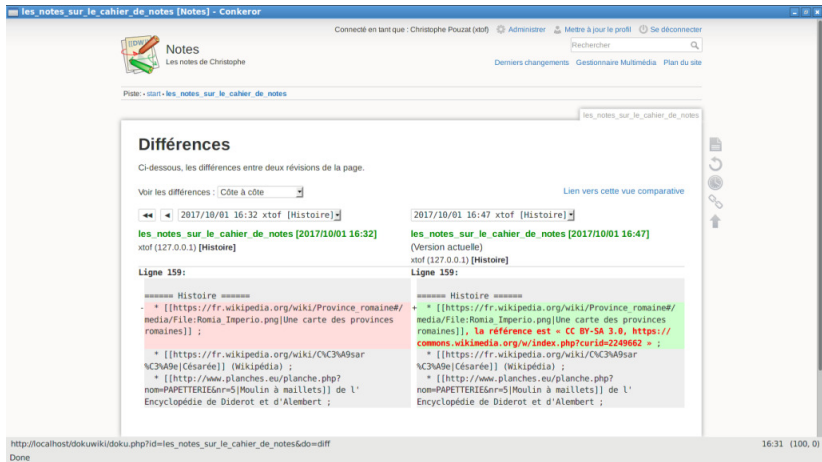
2018-09-03

## Lab books and note books

└ M1-S4: Notes (and codes) that are archived but can evolve with version control systems



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I see the differences between the two versions. You obtain the same thing on Wikipedia by clicking on *View History*.

2018-09-03

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# Pros and cons

- ▶ A solution with a strong record for collaborative projects (Wikipedia).
- ▶ A text format is used when working with Dokuwiki.
- ▶ A single page can be modified at a time.

2018-09-03

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# Version Control Systems

I now come to the most "sophisticated" solution:

- ▶ A dedicated software, **git**, is used to manage the successive versions of a **set** of files in **different formats** (text, images, etc.). In fact, file arborizations can be managed.
- ▶ git-like software requires a repository, that can be built on the user's computer, but is usually on a dedicated server like **GitHub** or **GitLab**.
- ▶ The repository allows several people to work on the same project and to exchange their modifications. Each project member has a **full copy** of the repository (dating back to his/her last *synchronization*).

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Lab books and note books

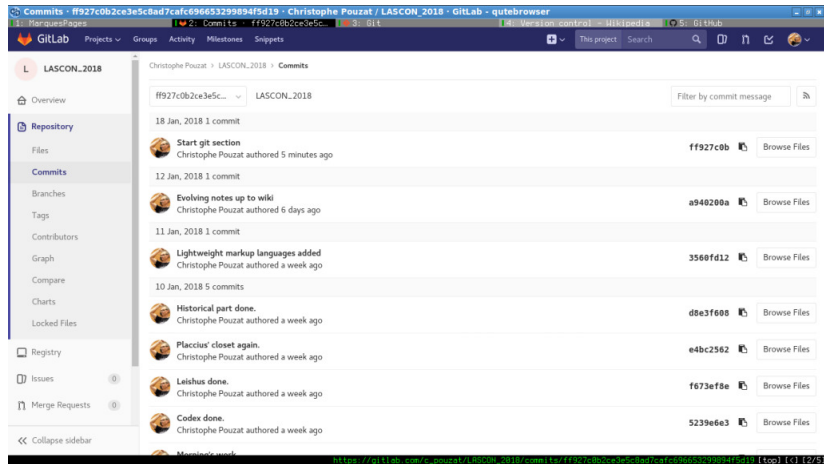
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The **GitLab** interface containing the files of this presentation.

2018-09-03

Lab books and note books

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The **GitLab** interface containing the files of this presentation.

Start git section (#927c0b) · Commits · Christophe Pouzat / LASCON\_2018 · GitLab · qutebrowser

Showing 1 changed file

```

90 cannot do the job.
91 ##END_EXPORT
92 *We need are more systematic and more explicit ways to describe h
93 ow the analysis (or modeling) was done*.
94 ** The solution  $\rightarrow$  Reproducible Research
95 *Reproducible Research* (-RR-) or *reproducible data analysis* is
96 an approach aiming at complementing classical printed scientific
97 articles with *everything* required to independently reproduce t
98 he results they present.
99 @ -876,7 +876,7 @@ Thanks to lightweight markup languages we
100 will be able to:
101 - Write our notes quickly with any editor.
102 - Organize our notes.
103 * Notes that are archived but can evolve with concurrent version
104 systems (CVS)
105 ** Introduction of this section
106 - The tools we are going to discuss should appeal to a much wider
107 audience than the reproducible research community.
108 - Anyone working on a text is concerned, even more so when this w
109 ork is done in collaboration.
110 @ -949,7 +949,7 @@ I started using
111 [[https://www.dokuwiki.org/dokuwiki#dokuwiki]] for this lecture
112 ##BEGIN_EXPORT latex
113 \vspace{0.25cm}
114 ##END_EXPORT
115 Clicking /previous versions/ (/anciennes r#evisions/) gives access
116 to the list of changes done when and by whom. If I know select tw
117 o versions...
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145 to the list of changes done when and by whom. If I now select two
146 versions...

```

[https://gitlab.com/c\\_pouzat/LASCON\\_2018/commit/ff927c0b2ce3e5c8ad7caf696653299894f5d19](https://gitlab.com/c_pouzat/LASCON_2018/commit/ff927c0b2ce3e5c8ad7caf696653299894f5d19) [27x] [c] [2/5]

Modifications are easily visualized...

2018-09-03

Lab books and note books

└ M1-S4: Notes (and codes) that are archived but can evolve with version control systems



Modifications are easily visualized...

Lectures/ReproducibleResearch/Pouzat\_Lascon2018\_RR\_slides.org · master · Christophe Pouzat / LASCON\_2018 · GitLab - qutebrowser

Christophe Pouzat

GitLab Projects Groups Snippets Help

LASCON\_2018

Overview

Repository

Files

Commits

Branches

Tags

Contributors

Graph

Compare

Charts

Locked Files

Registry

Issues 0

Merge Requests 0

Collapse sidebar

## Markdown is not the only lightweight markup language

Among the "most popular":

- [MediaWiki](#) used by Wikipedia (but files are not stored in text format).
- [DokuWiki](#) like [MediaWiki](#) but stored in text format.
- [reStructuredText](#) used for the [python](#) documentation.
- [AsciiDoc](#).
- [Org mode](#), my favorite, but it requires learning [emacs](#) (a good thing to do, if you have time for it).

The good news is that you don't need to be too nervous about choosing the "right" language, thanks to [pandoc](#) you can convert one into any other!

### Section's summary

Thanks to lightweight markup languages we will be able to:

- Work mostly with text files.
- Write our notes quickly with any editor.
- Organize our notes.

### Notes that are archived but can evolve with version control systems

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[https://gitlab.com/ChristophePouzat/LASCON\\_2018\\_RR\\_slides.org/master/Lectures/ReproducibleResearch/Pouzat\\_Lascon2018\\_RR\\_slides.org](https://gitlab.com/ChristophePouzat/LASCON_2018_RR_slides.org/master/Lectures/ReproducibleResearch/Pouzat_Lascon2018_RR_slides.org) [622] [10] [3/3]

Text files entered with a lightweight markup language get automatically formatted (an example with org).

2018-09-03

Lab books and note books

└─ M1-S4: Notes (and codes) that are archived but can evolve with version control systems



Text files entered with a lightweight markup language get automatically formatted (an example with org).

# Pros and cons

- ▶ A "sophisticated" approach that takes a bit more time to learn and master than the other two.
- ▶ A strong record for collaborative projects (Linux kernel, ...).
- ▶ Can manage modifications on several files at once.
- ▶ A centralized version **copied** by each member of the project.

2018-09-03

## Lab books and note books

- └ M1-S4: Notes (and codes) that are archived but can evolve with version control systems
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M1-S5: Finding one's way with tags and desktop search application

2018-09-03

Lab books and note books

└─ M1-S5: Finding one's way with tags and desktop search application

└─ Where are we?

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# Leibniz again

"It seems to me that the apparatus of contemporary scholarship is comparable to a very large store which, though it keeps a great variety of goods, yet is totally confused and in disorder, because all items are mixed up, because no numbers or letters of an index are displayed, and because inventories or account ledgers which could throw some light on the matter are missing."

"The larger the mass of collected things, the less will be their usefulness. Therefore, one should not only strive to assemble new goods from everywhere, but one must endeavor to put in the right order those that one already possesses."

2018-09-03

Lab books and note books

└ M1-S5: Finding one's way with tags and desktop search application

└ Leibniz again

Leibniz again

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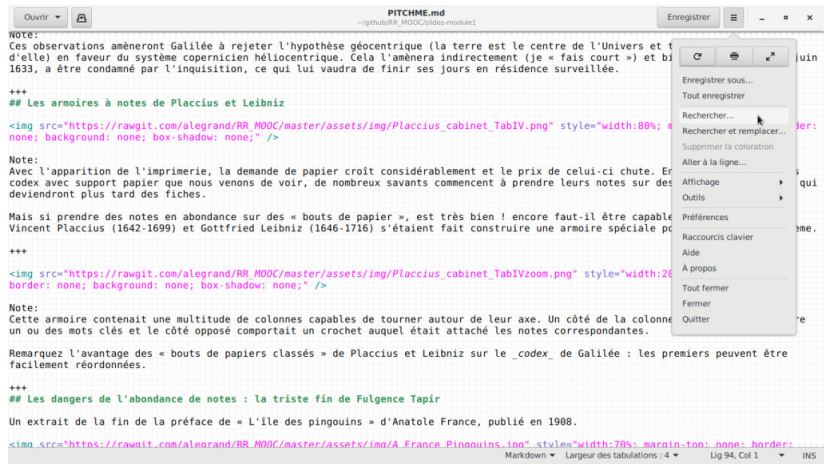
## Lab books and note books

└ M1-S5: Finding one's way with tags and desktop search application

└ Finding one's way in a text file

2018-09-03

## Finding one's way in a text file





# Finding one's way in a notebook

Data - PMC holds

- stack  $60 \times 80 \times 168$  32-bit integer
- time 168 32-bit floating-point

stack

ocd chip dimensions =  $60 \times 80$  pixels

Daq = Fura-2

Excitation wavelength = 340 nm

Recording performed by = Andreas Pippen

Reference = --

Units = 100

time

stimulation time = 582

Units = seconds

FURA_PI	B+ Pipette
T_340	lambda ["lambda_bond"]
T_360	lambda ["lambda_100"]
T_380	lambda ["lambda_free"]
GAIN	G
SLO	s.ro
P	roi \$P
P_B	roi \$P
EXPNAME	expName

76 Code / Neuro / Calcium

A

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5, 7, 9, 31, 33, 40, 82, 86, 89, 102, 103,  
11-16, 42, 55, 62-63  
10, 24, 23, 28, 56, 76, 79, 80, 81, 93, 100, 114, 118-123, 125, 127-128, 130

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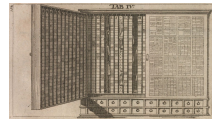
190

2018-09-03

Lab books and note books

└ M1-S5: Finding one's way with tags and desktop search application

└ Finding one's way in a notebook



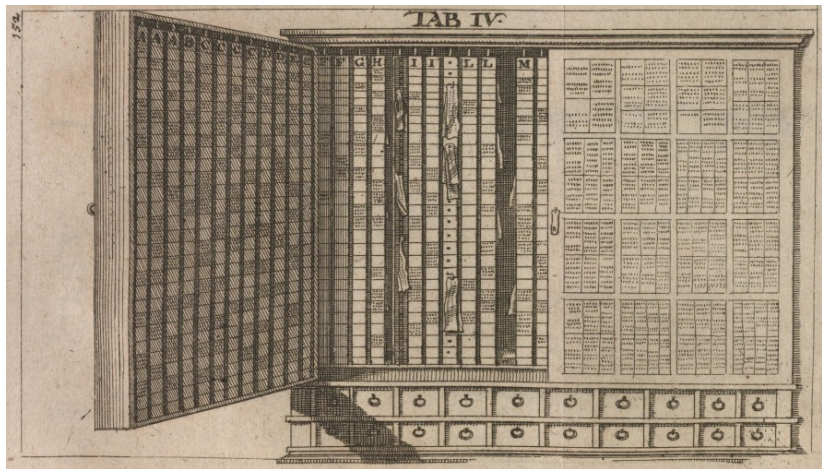
2018-09-03

Lab books and note books

└ M1-S5: Finding one's way with tags and desktop search application

└ Finding one's way in a cards collection

# Finding one's way in a cards collection



# Problems, limitations, solutions?

- ▶ A single document at a time
- ▶ Numerical files indexation
- ▶ Tagging numerical files in general (not only text format files)
- ▶ Using a desktop search application for indexation and general search

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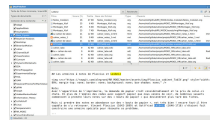
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└ M1-S5: Finding one's way with tags and desktop search application

└ Problems, limitations, solutions?

Problems, limitations, solutions?

- ▶ A single document at a time
- ▶ Numerical files indexation
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## Lab books and note books

└ M1-S5: Finding one's way with tags and desktop search application

└ Finding an arbitrary word with a desktop search application (DocFetcher)

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## Finding an arbitrary word with a desktop search application (DocFetcher)

DocFetcher

Taille de fichier minimale / maximale

Types de documents

Contexte de la recherche

- Adapt
- AppliedStats
- Asymptotics
- Base\_Figures
- Bayesian-Analysis
- Bootstrap
- BrownianMotion
- cahier
- ChannelStuff
- Classification
- Cumsum
- DynamicMonteCarlo
- EDA
- ErrorPropagation
- ExperimentalDesign
- FDA
- GAM
- GaussianProcessForMachineLee
- gitlab
- Graph
- HiddenMarkovModel
- Information\_Theory
- LaTeXStuff
- Linux
- Nonparametric
- RR\_MOOC
- Smooth&ndKernel

Recherche

Titre	Score [%]	Taille	Nom de fichier	Type	Chemin	Auteurs
Notes_module1	26	47 KB	Notes_module1.org	org	/home/xtof/github/RR_MOOC/slides-module1/Notes_module1.org	
Montages_Xtof	25	6 KB	Montages_Xtof.org	org	/home/xtof/cahier/projets/MOOC_RR/Montages_Xtof.org	
Montages_Xtof	25	6 KB	Montages_Xtof.org	org	/home/xtof/gitlab/cahier/projets/MOOC_RR/Montages_Xtof.org	
Montages_Xtof	25	7 KB	Montages_Xtof.org	org	/home/xtof/github/RR_MOOC/assets/img/Montages_Xtof.org	
Le cahier de laborz	21	12 KB	cahier_notes_1.html	html	/home/xtof/cahier/projets/MOOC_RR/cahier_notes_1.html	Christo
cahier_notes_1	21	9 KB	cahier_notes_1.md	md	/home/xtof/gitlab/cahier/projets/MOOC_RR/cahier_notes_1.md	
Le cahier de laborz	21	12 KB	cahier_notes_1.html	html	/home/xtof/gitlab/cahier/projets/MOOC_RR/cahier_notes_1.html	Christo
PITCHME	20	53 KB	PITCHME.md	md	/home/xtof/github/RR_MOOC/slides-module1/PITCHME.md	
cahier_labo	9	42 KB	cahier_labo.wiki	wiki	/home/xtof/cahier/projets/MOOC_RR/cahier_labo.wiki	
Le « cahier de note	9	44 KB	cahier_labo.odt	odt	/home/xtof/cahier/projets/MOOC_RR/cahier_labo.odt	Rodior
cahier_labo	9	42 KB	cahier_labo.org	org	/home/xtof/cahier/projets/MOOC_RR/cahier_labo.org	
Le « cahier de note	9	44 KB	cahier_labo.odt	odt	/home/xtof/gitlab/cahier/projets/MOOC_RR/cahier_labo.odt	Rodior
cahier_labo	9	42 KB	cahier_labo.org	org	/home/xtof/gitlab/cahier/projets/MOOC_RR/cahier_labo.org	

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## Les armoires à notes de Placcius et **Leibniz**



Note:

Avec l'apparition de l'imprimerie, la demande de papier croit considérablement et le prix de celui-ci chute. En plus de l'emploi des codex avec support papier que nous venons de voir, de nombreux savants commencent à prendre leurs notes sur des « bouts de papier » qui deviendront plus tard des fiches.

Mais si prendre des notes en abondance sur des « bouts de papier », est très bien ! encore faut-il être capable de s'y retrouver. Vincent Placcius (1642-1699) et Gottfried **Leibniz** (1646-1716) s'étaient fait construire une armoire spéciale pour résoudre ce problème.

...

Résultats : 22

# A problem: overabundance

DocFetcher

Taille de fichier minimale / maximale

Types de documents

Contexte de la recherche

- Adapt
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- gitlab
- Graph
- HiddenMarkovModel
- Information\_Theory
- LaTeXstuff
- Linux
- Nonparametric
- RR\_MOOC
- SmoothAndKernel

Résultats : 306

Recherche

Titre	Score [%]	Taille	Nom de fichier	Type	Chemin	Auteurs
hd5_to_fits	65	1 KB	hd5_to_fits.py	py	/home/xtof/gitlab/cahier/projects/ENP2017/hd5_to_fits.py	
cfda_loading_curv	61	1 KB	cfda_loading_curve_test.c	c	/home/xtof/cahier/projects/Calcium/cfda/cfda_loading_curve_test.c	
cfda_transient_tes	61	1 KB	cfda_transient_test.c	c	/home/xtof/cahier/projects/Calcium/cfda/cfda_transient_test.c	
cfda_exp_par_test	61	1 KB	cfda_exp_par_test.c	c	/home/xtof/cahier/projects/Calcium/cfda/cfda_exp_par_test.c	
cfda_exp_par_test	61	1 KB	cfda_exp_par_test.c	c	/home/xtof/cahier/projects/Calcium/cfda/cfda_20161007.tgz/cfda_e	
cfda_loading_curv	61	1 KB	cfda_loading_curve_test.c	c	/home/xtof/cahier/projects/Calcium/cfda/cfda_20161007.tgz/cfda_l	
cfda_transient_tes	61	1 KB	cfda_transient_test.c	c	/home/xtof/cahier/projects/Calcium/cfda/cfda_20161007.tgz/cfda_t	
My Project: File Lis	54	5 KB	files.html	html	/home/xtof/cahier/projects/Calcium/cfda/html/files.html	
My Project: File Lis	54	5 KB	files.html	html	/home/xtof/gitlab/cahier/projects/Calcium/cfda/html/files.html	
direct_approach_o	51	23 KB	direct_approach_outline.odt	odt	/home/xtof/cahier/projects/Calcium/DirectApproach/direct_approac	
direct_approach_o	51	13 KB	direct_approach_outline.htr	html	/home/xtof/cahier/projects/Calcium/DirectApproach/direct_approac	
direct_approach_o	51	23 KB	direct_approach_outline.odt	odt	/home/xtof/gitlab/cahier/projects/Calcium/DirectApproach/direct_a	
direct_approach_o	51	13 KB	direct_approach_outline.htr	html	/home/xtof/gitlab/cahier/projects/Calcium/DirectApproach/direct_a	
direct_approach_o	47	15 KB	direct_approach_outline.docx	docx	/home/xtof/cahier/projects/Calcium/DirectApproach/direct_approac	
direct_approach_o	47	248 KB	direct_approach_outline.pdf	pdf	/home/xtof/cahier/projects/Calcium/DirectApproach/direct_approac	

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An outline of the "direct approach"

The most common type of analysis performed on fluorescence data when studying calcium dynamics implies fitting a generally non-linear model to the fluorescence or to data derived from the latter-like the estimated free calcium concentration made available by the ratio-metric method-. If, in addition to the "best guess" for the model parameters (a point estimation in statistical jargon), one wants confidence intervals, a proper noise model-giving the distribution of the observed data around their mean value-is necessary. The "direct approach" proposed by Joucla et al (2010)1Joucla S., Pippow A., Kloppenburg P. and Pouzat, C. (2010) Quantitative estimation of calcium dynamics from ratiometric measurements: A direct, non-ratioing, method. J Neurophys 103: 1130-1144.

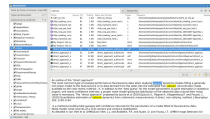
is a method providing best guesses with confidence intervals for the parameters of a model fitted to fluorescence data. Noise model: noise sources of a CCD camera and variance stabilization As detailed in van Vliet et al (1998)2van Vliet, L.J. and Boddeke, F.R. and Sudar, D. and Young, I.T. (1998) Image Detectors for

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# Adding tags / keywords in a text file (Markdown)

Remarkable: Etiquette\_avec\_Markdown.md

File Edit View Format Insert Style Help

1 # Comment rajouter des étiquettes dans un fichier Markdown ?  
 2  
 3 Pour rajouter une étiquette ou un mot clé visible par un `moteur de recherche de bureau`, nous pouvons les insérer dans des `commentaires`, c'est-à-dire des parties du fichier texte `source` qui ne seront pas montrées par le logiciel de rendu — comme le navigateur internet lors de la génération d'une sortie au format `HTML`.  
 4  
 5 Le [didacticiel Markdown](https://enacit1.epfl.ch/markdown-pandoc) de Jean-Daniel Bonjour nous explique clairement comment faire cela en section `3.2.7.4 Autres remarques sur les listes`. Pour rajouter en commentaire l'étiquette `:ceci-est-une-étiquette:`, il suffit de taper : `<!-- :ceci-est-une-étiquette: -->`. Nous pouvons ainsi étiqueter les différents éléments d'une liste :  
 6  
 7 \* le premier élément ; `<!-- :étiquette-1: -->`  
 8 \* le deuxième élément. `<!-- :étiquette-2: -->`  
 9  
 10 Et voilà !

---

## Comment rajouter des étiquettes dans un fichier Markdown ?

Pour rajouter une étiquette ou un mot clé visible par un `moteur de recherche de bureau`, nous pouvons les insérer dans des `commentaires`, c'est-à-dire des parties du fichier texte `source` qui ne seront pas montrées par le logiciel de rendu — comme le navigateur internet lors de la génération d'une sortie au format `HTML`.

Le [didacticiel Markdown](#) de Jean-Daniel Bonjour nous explique clairement comment faire cela en section `3.2.7.4 Autres remarques sur les listes`. Pour rajouter en commentaire l'étiquette `:ceci-est-une-étiquette:`, il suffit de taper : `<!-- :ceci-est-une-étiquette: -->`. Nous pouvons ainsi étiqueter les différents éléments d'une liste :

- le premier élément ; `<!-- :étiquette-1: -->`
- le deuxième élément. `<!-- :étiquette-2: -->`

Et voilà !

Lines: 10, Words: 119, Characters: 878

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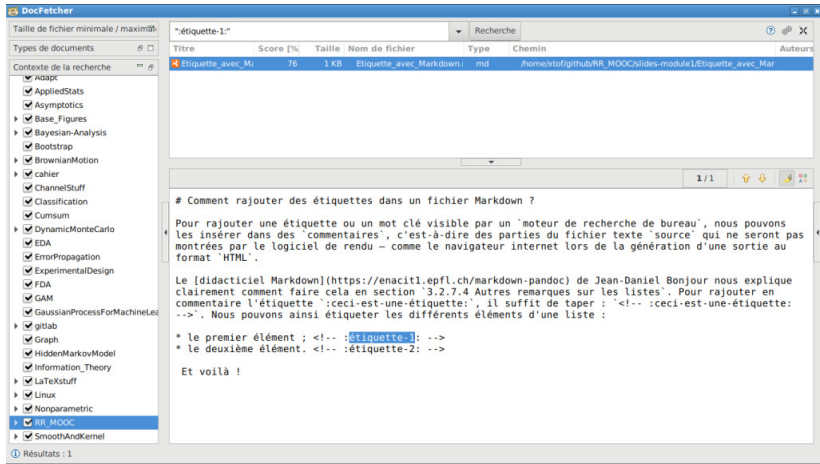
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└ Adding tags / keywords in a text file (Markdown)



# Finding a tag with a desktop search application (DocFetcher)



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└─ M1-S5: Finding one's way with tags and desktop search application

└─ Finding a tag with a desktop search application (DocFetcher)

Finding a tag with a desktop search application (DocFetcher)



# Image files contain metadata

```
xtof@xtof-pc:/home/xtof
Fichier Edition Onglets Aide
[xtof@xtof-pc ~]$ exiftool IndexCahierLocke.jpg
ExifTool Version Number      : 10.80
File Name                    : IndexCahierLocke.jpg
Directory                   : .
File Size                    : 1420 kB
File Modification Date/Time  : 2018:03:29 14:43:49+02:00
File Access Date/Time       : 2018:03:29 14:43:48+02:00
File Inode Change Date/Time  : 2018:03:29 16:10:56+02:00
File Permissions            : rw-r--r--
File Type                    : JPEG
File Type Extension         : jpg
MIME Type                   : image/jpeg
JFIF Version                 : 1.01
Resolution Unit              : cm
X Resolution                 : 118
Y Resolution                 : 118
Image Width                  : 3166
Image Height                 : 2451
Encoding Process             : Baseline DCT, Huffman coding
Bits Per Sample              : 8
Color Components             : 3
Y Cb Cr Sub Sampling        : YCbCr4:4:4 (1 1)
Image Size                   : 3166x2451
Megapixels                   : 7.8
[xtof@xtof-pc ~]$
```

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└─ Image files contain metadata

Image files contain metadata

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File Inode Change Date/Time  : 2018:03:29 16:10:56+02:00
File Permissions            : rw-r--r--
File Type                    : JPEG
File Type Extension         : jpg
MIME Type                   : image/jpeg
JFIF Version                 : 1.01
Resolution Unit              : cm
X Resolution                 : 118
Y Resolution                 : 118
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Image Size                   : 3166x2451
Megapixels                   : 7.8
```

# Metadata can be set

```
xtof@xtof-pc:/home/xtof
Fichier Edition Onglets Aide
[xtof@xtof-pc ~]$ exiftool -comment=":étiquette-1:" IndexCahierLocke.jpg
  1 image files updated
[xtof@xtof-pc ~]$ exiftool IndexCahierLocke.jpg
ExifTool Version Number      : 10.80
File Name                    : IndexCahierLocke.jpg
Directory                   : .
File Size                    : 1420 kB
File Modification Date/Time  : 2018:03:29 16:14:06+02:00
File Access Date/Time       : 2018:03:29 16:14:06+02:00
File Inode Change Date/Time  : 2018:03:29 16:14:06+02:00
File Permissions             : rw-r--r--
File Type                   : JPEG
File Type Extension         : jpg
MIME Type                   : image/jpeg
JFIF Version                 : 1.01
Resolution Unit             : cm
X Resolution                 : 118
Y Resolution                 : 118
Comment                     : :étiquette-1:
Image Width                 : 3166
Image Height                : 2451
Encoding Process            : Baseline DCT, Huffman coding
Bits Per Sample             : 8
Color Components            : 3
Y Cb Cr Sub Sampling        : YCbCr4:4:4 (1 1)
Image Size                  : 3166x2451
Megapixels                  : 7.8
[xtof@xtof-pc ~]$
```

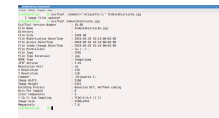
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Lab books and note books

└─ M1-S5: Finding one's way with tags and desk-top search application

└─ Metadata can be set

Metadata can be set



# Desktop search applications can read metadata

The screenshot shows the DocFetcher application interface. On the left, there is a sidebar with a tree view of search contexts, including folders like 'RR\_MOOC' and 'SmoothAndKernel'. The main window displays search results for the query '\*étiquette-1\*'. Two results are shown:

Titre	Score [%]	Taille	Nom de fichier	Type	Chemin	Auteurs
IndexCahierLocke	122	1 421 KI	IndexCahierLocke.jpg	jpg	/home/xtof/github/RR_MOOC/assets/img/IndexCahierLocke.jpg	
Etiquette_avec_M...	76	1 KB	Etiquette_avec_Markdown.i	md	/home/xtof/github/RR_MOOC/slides-module1/Etiquette_avec_Mar	

The selected file 'Etiquette\_avec\_M...' is shown with its metadata in a detailed view below the results table:

```

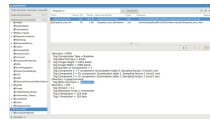
Directory = JPEG
Tag Compression Type = Baseline
Tag Data Precision = 8 bits
Tag Image Height = 2451 pixels
Tag Image Width = 3166 pixels
Tag Number of Components = 3
Tag Component 1 = Y component: Quantization table 0, Sampling factors 1 horiz/1 vert
Tag Component 2 = Cb component: Quantization table 1, Sampling factors 1 horiz/1 vert
Tag Component 3 = Cr component: Quantization table 1, Sampling factors 1 horiz/1 vert
Directory = jpegComment
Tag JPEG Comment = Etiquette-1:
Directory = JFIF
Tag Version = 1.1
Tag Resolution Units = centimetre
Tag X Resolution = 118 dots
Tag Y Resolution = 118 dots
  
```

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└ Desktop search applications can read metadata



# Conclusions

Using:

- ▶ tags / keywords inserted in our numerical files (text, images, PDF, etc.)
- ▶ a desktop search application

we can (perhaps) avoid "Leibniz's nightmare".

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└─ M1-S5: Finding one's way with tags and desktop search application

└─ Conclusions

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