

Mini-workshop \LaTeX and Git

Daniel Pereira
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TQ - Quantum Communications
DFIS, University of Aveiro
November 14, 2018



universidade
de aveiro



instituto de
telecomunicações

2019-04-01

Mini-workshop \LaTeX and Git

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INSTITUIÇÕES ASSOCIADAS



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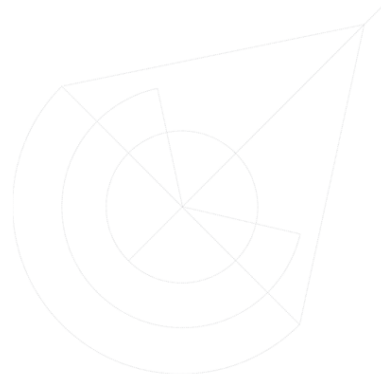
Introduction to \LaTeX

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Mini-workshop \LaTeX and Git
└ Introduction to \LaTeX

Introduction to \LaTeX

Intro



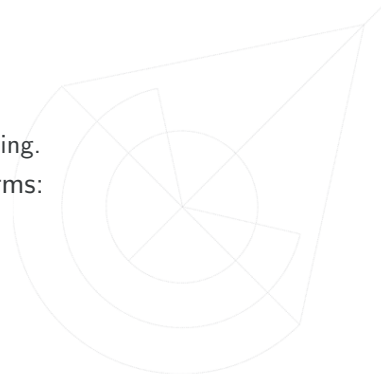
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Mini-workshop \LaTeX and Git
└ Introduction to \LaTeX
└ Intro

Intro

Initial notions

- What is it?
 - A document preparation system for high-quality typesetting.
- It has some advantages when compared to Office platforms:
 - Free.
 - Easy reference and citation management.
 - Potent mathematical writing.
 - Very commonly used in science and engineering.
 - It's as cross-platform as you can get.



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- └ Introduction to \LaTeX
 - └ Intro
 - └ Initial notions

- Não é um What You See Is What You Get
- Escrevem código que depois é interpretado
- Só precisam de se preocupar com o conteúdo
- As imagens ficam bem numeradas!

Initial notions

- What is it?
 - A document preparation system for high-quality typesetting.
- It has some advantages when compared to Office platforms:
 - Free.
 - Easy reference and citation management.
 - Potent mathematical writing.
 - Very commonly used in science and engineering.
 - It's as cross-platform as you can get.

Initial notions

- What is needed for it to work?
 - A \TeX distribution (MiKTeX, MacTex, etc).
 - Some text editor: Texmaker, TeXworks, TeXShop, Overleaf and Sharelatex (online editor).
- What is handy to have?
 - Citation manager (Mendeley, Bibdesk or other).
 - A decent PDF reader (Foxit Reader, Adobe Acrobat or other).
- Whenever you have any doubts, Google en.wikibooks.org/wiki/LaTeX.

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- └ Introduction to \LaTeX
 - └ Intro
 - └ Initial notions

Initial notions

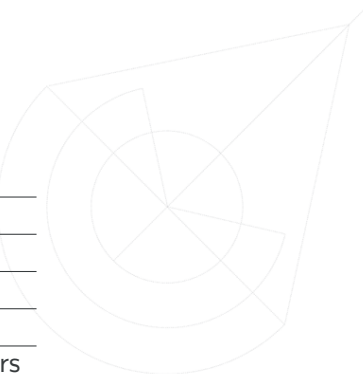
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- Whenever you have any doubts, Google en.wikibooks.org/wiki/LaTeX.

- Overleaf e Sharelatex podem ser vistos como o google docs do latex

Special characters

- These characters will not work properly if written directly.

#	Defines arguments
\$	Start math mode
^	Starts superscript
_	Starts subscript
%	Makes rest of line commented
{ }	Defines an isolated set of characters
\	Defines a command



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- └ Introduction to \LaTeX
 - └ Intro
 - └ Special characters

- São caracteres reservados, tal como no matlab não podem chamar $a+b$ a uma variável
- \wedge e $_$ só podem ser chamados num ambiente matemático
- É possível usar estes caracteres se chamados correctamente

Special characters

• These characters will not work properly if written directly.

#	Defines arguments
\$	Start math mode
^	Starts superscript
_	Starts subscript
%	Makes rest of line commented
{ }	Defines an isolated set of characters
\	Defines a command

What is a command

- A command has the following structure:

`\commandname[option1, option2]{argument1}{argument2}`

- Examples:

`\documentclass[11pt]{report}`

`\usepackage[utf8x]{inputenc}`

- The `\usepackage` command includes packages in the document, these packages give meaning to a few commands. Example:

`\usepackage{amsmath}` allows for equation writing.



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└ Intro

└ What is a command

- Diferentes comandos têm um diferentes opções e argumentos
- explicar `\documentclass`
- **explicar `inputenc`**
- explicar `\usepackage`

What is a command

• A command has the following structure:

`\commandname[option1, option2]{argument1}{argument2}`

• Examples:

`\documentclass[11pt]{report}`

`\usepackage[utf8x]{inputenc}`

• The `\usepackage` command includes packages in the document, these packages

give meaning to a few commands. Example:

`\usepackage{amsmath}` allows for equation writing.

What is an environment

```
\begin{environment}
```

...ambient content...

```
\end{environment}
```

- There is plenty of code that only functions inside a specific environment. Example:

```
\begin{document}
```

...document content...

```
\end{document}
```



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└ Intro

└ What is an environment

- idem

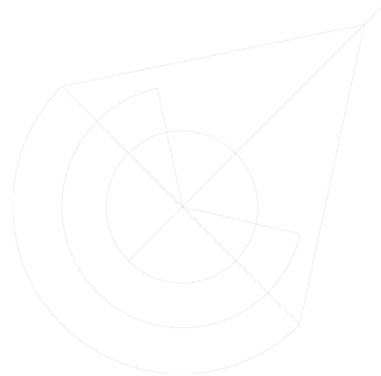
What is an environment

```
\begin{environment}
...ambient content...
\end{environment}

- There is plenty of code that only functions inside a specific environment. Example:

\begin{document}
...document content...
\end{document}
```


How to start a document



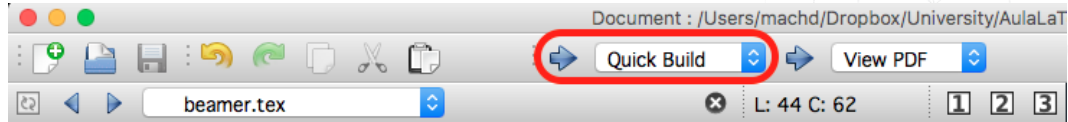
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└ Introduction to \LaTeX
└ How to start a document

How to start a document

Offline \LaTeX compilation

- The code to be compiled should be in a `.tex` file.
- Compilation can be done with a `.tex` editor or in the command line.

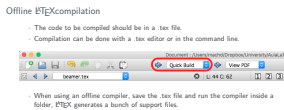


- When using an offline compiler, save the `.tex` file and run the compiler inside a folder, \LaTeX generates a bunch of support files.

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- └ Introduction to \LaTeX
 - └ How to start a document
 - └ Offline \LaTeX compilation



- Há diferentes opções de compilação, não se preocupem com isso
- o \LaTeX gera alguns ficheiros de apoio, não precisam de se preocupar com esses
- não são grandes (só alguns kB)
- De certeza que vai perguntar se pode instalar pacotes, cliquem OK

Offline L^AT_EX compilation

- This is what a L^AT_EX code looks like.

```
1 \documentclass{report}
2 \usepackage[utf8]{inputenc}
3
4 \begin{document}
5 Isto é um documento com uma linha de texto.
6 \end{document}
```

- Compilation usually returns a .pdf file.

Isto é um documento com uma linha de texto.

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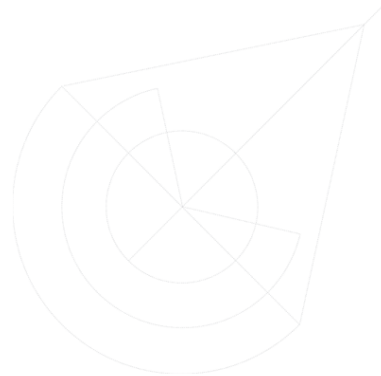
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- └ Introduction to L^AT_EX
 - └ How to start a document
 - └ Offline L^AT_EX compilation

- Dizer o que é que é o preâmbulo
- Voltar a apontar o inputenc



Simple text editing



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- └ Introduction to \LaTeX
- └ Simple text editing

Simple text editing

bold, *italics*, underline, colourful

- ▶ `\textbf{Bold text}`
- ▶ `\textit{Italicised text}`
- ▶ `\underline{Underlined text}`
- ▶ `\textcolor{Colourname}{Colourful text}`
 - ▶ Colour names can be found here→en.wikibooks.org/wiki/LaTeX/Colors.



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└ Introduction to L^AT_EX

└ Simple text editing

└ **bold**, *italics*, underline, colourful

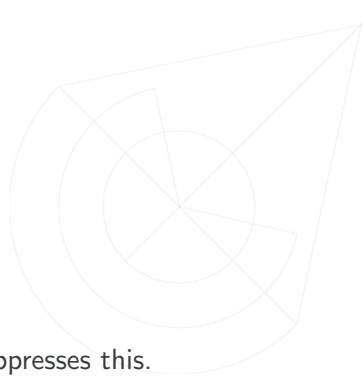
- Idem

bold, *italics*, underline, colourful

- ▶ `\textbf{Bold text}`
- ▶ `\textit{Italicised text}`
- ▶ `\underline{Underlined text}`
- ▶ `\textcolor{Colourname}{Colourful text}`
 - ▶ Colour names can be found here→en.wikibooks.org/wiki/LaTeX/Colors.

Paragraphs, line breaks and sections

- `\\` Breaks the line, doesn't start a new paragraph.
- `\par` Breaks the line and starts a new paragraph.
- `\chapter{Chapter name}` Starts a chapter.
- `\section{Section name}` Starts a section.
`\subsection{Subsection name},`
`\subsubsection{Subsubsection name}`
- All of these are numbered, writing a `*` before the `{}` suppresses this.



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└ Introduction to L^AT_EX

└ Simple text editing

└ Paragraphs, line breaks and sections

Paragraphs, line breaks and sections

- `\\` Breaks the line, doesn't start a new paragraph.
- `\par` Breaks the line and starts a new paragraph.
- `\chapter{Chapter name}` Starts a chapter.
- `\section{Section name}` Starts a section.
- `\subsection{Subsection name},`
`\subsubsection{Subsubsection name}`
- All of these are numbered, writing a `*` before the `{}` suppresses this.

- Esta é a maneira correcta de fazer parágrafos
- Tudo o que estiver a seguir a um chapter/section/etc pertence esse chapter/section/etc até o seguinte ser declarado

Titles, authors and tables of contents

- All of these can be generated automatically by \LaTeX , their appearance depends on the template.
- In this case, you need to give \LaTeX the necessary information, in the preamble write:
 - `\title{Title}`
 - `\author{Author or Authors}`
 - `\date{Date}`
- For the title to appear you need to use the `\maketitle` command, usually right after:
`\begin{document}`
- You may be given a template where the title is defined explicitly, in that case just alter the corresponding text.
- To generate the index just write the command `\tableofcontents`, usually right after the `\maketitle`.

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└ Introduction to \LaTeX

└ Simple text editing

└ Titles, authors and tables of contents

- Relembrar o que é que é o preâmbulo.
- Compilem o template que vos deram, vejam o título e procurem onde é que isso aparece no código

Titles, authors and tables of contents

• All of these can be generated automatically by \LaTeX , their appearance depends on the template.
• In this case, you need to give \LaTeX the necessary information, in the preamble write:
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`\begin{document}`
• You may be given a template where the title is defined explicitly, in that case just alter the corresponding text.
• To generate the index just write the command `\tableofcontents`, usually right after the `\maketitle`.

Changing the language of the document

- Some compilers have a spell checker, set it to the language you are using.

- The language of the document can be changed with the `babel` package.

```
1 \documentclass{report}
2 \usepackage[utf8]{inputenc}
3 \usepackage[portuguese]{babel}
4
5 \title{Isto é um título}
6 \author{Eu escrevi isto}
7 \date{\today}
8
9 \begin{document}
10 \maketitle
11 \tableofcontents
12 \chapter{Isto é um capítulo}
13 \section{Isto começa uma secção}
14 \subsection*{Esta subsecção não é numerada}
15 Isto é um documento com uma linha de texto.
16 \chapter{Isto é outro capítulo}
17 \end{document}
```

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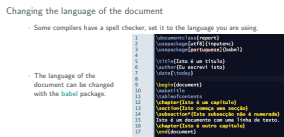
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└ Introduction to L^AT_EX

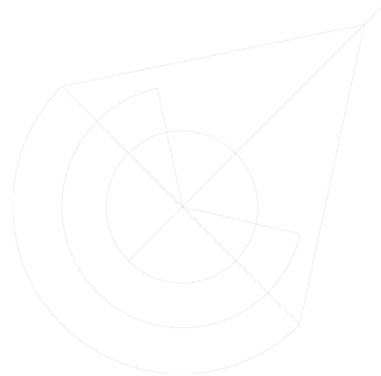
└ Simple text editing

└ Changing the language of the document

- explicar que isto muda Chapter para Capítulo, Section para Secção, etc



Making tables

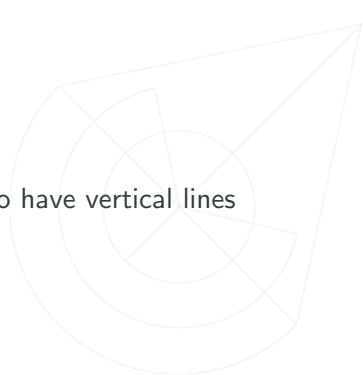


Tables - the hard way

- You need to use the `{table}` environment.
- You need to use the `{tabular}` environment.
- You need to set the column alignment and if you want to have vertical lines between them.
- You have to set the horizontal lines you want.

```
\begin{table}[]  
\begin{tabular}{c|cl}  
cell1 & cell2 & cell3 \\ \hline  
cell4 & cell5 & cell6  
\end{tabular}  
\end{table}
```

- You can declare merged cells, partial horizontal and vertical lines, this easily becomes way too complex.



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└ Introduction to L^AT_EX

└ Making tables

└ Tables - the hard way

- Primeiro a complicada, explicar tudo
- Explica o código passo a passo

Tables - the hard way

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- You need to use the `{tabular}` environment.
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```
\begin{table}[]  
\begin{tabular}{c|cl}  
cell1 & cell2 & cell3 \\ \hline  
cell4 & cell5 & cell6  
\end{tabular}  
\end{table}
```

- You can declare merged cells, partial horizontal and vertical lines, this easily becomes way too complex.

Tables - the easy way

- Use this website www.tablesgenerator.com.

The screenshot shows the 'Tables Generator' website. At the top, there are tabs for 'LaTeX Tables', 'HTML Tables', 'Text Tables', 'Markdown Tables', 'MediaWiki Tables', and 'Contact'. Below the tabs is the 'LaTeX Table Generator' header with Facebook and Twitter links. A menu bar includes 'File', 'Edit', 'Table', 'Column', 'Row', 'Cell', and 'Help'. A toolbar contains icons for table structure, text formatting (bold, italic, underline), alignment, and a 'Default table style' dropdown. A small table editor shows a 3x3 grid with the first cell highlighted. Below the editor is a 'Generate' button. The 'Result' section shows the generated LaTeX code:

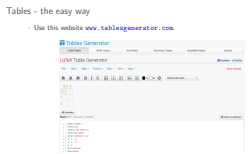
```
1 \begin{table}{}
2 \centering
3 \caption{My caption}
4 \label{my-label}
5 \begin{tabular}{lll}
6 & & \\
7 & & \\
8 & & \\
9 \end{tabular}
10 \end{table}
```

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- Introduction to \LaTeX
 - Making tables
 - Tables - the easy way

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- A maneira simples, usem esta.
- Funciona estilo Excell
- Gera o código no fim, podem copiar e colar para o documento
- Dá jeito perceber o método complicado, para conseguir perceber o código gerado.



What are *floats*?

- You may have noticed a blank space in the previous code.
- With the information inside the `[]`, \LaTeX decides where it will draw the table.

```
1 \begin{table}[ ]
2 \centering
3 \caption{My caption}
4 \label{my-label}
5 \begin{tabular}{lll}
6 & & \\
7 & & \\
8 & & \\
9 \end{tabular}
10 \end{table}
```

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- └ Introduction to \LaTeX
 - └ Making tables
 - └ What are *floats*?

- Chama-se um float

What are *floats*?

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- With the information inside the `[]`, \LaTeX decides where it will draw the table.

```
1 \begin{table}[ ]
2 \centering
3 \caption{My caption}
4 \label{my-label}
5 \begin{tabular}{lll}
6 & & \\
7 & & \\
8 & & \\
9 \end{tabular}
10 \end{table}
```

Types of *float*

- There are multiple types of *floats*:
 - H - Draws the *float* exactly where it is declared, may deform the text.
 - h - Draws the *float* close to where it is declared, this avoids deforming the text.
 - t - Draws the float at the top of the page in which it is declared.
 - b - Draws the *float* at the bottom of the page in which it is declared.
 - p - Draws the float in a page restricted to *floats*.
- The `{figure}` environment also uses floats *floats*.
- Use the package `{float}`

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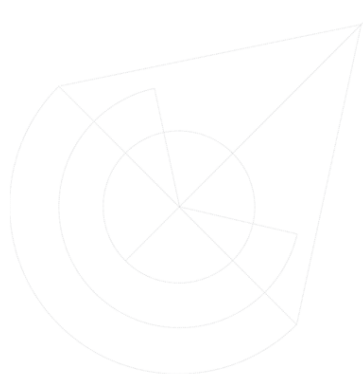
- └ Introduction to L^AT_EX
 - └ Making tables
 - └ Types of *float*

- Idem

Types of *float*

- There are multiple types of *floats*:
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Figures and images



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└ Introduction to \LaTeX
└ Figures and images

Figures and images

How to declare an image

- Use the `{graphicx}` package.
- Images need to be inside a folder where \LaTeX knows it should look.

```
\graphicspath{ {pathtofolder1}{pathtofolder2} }
```

- Images should be declared inside the `{figure}` environment.

```
\begin{figure}[float]
```

```
\centering
```

```
\includegraphics[figure alterations]{imagename}
```

```
\end{figure}
```

- PNG, JPG, PDF are all accepted. Other file types are as well, check google in case of doubts.
- Multiple properties can be altered, check en.wikibooks.org/wiki/LaTeX/Importing_Graphics

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└ Introduction to \LaTeX

└ Figures and images

└ How to declare an image

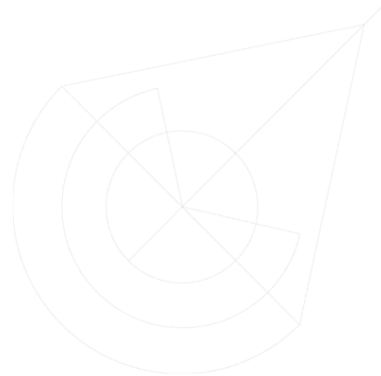
How to declare an image

- Use the `{graphicx}` package.
 - Images need to be inside a folder where \LaTeX knows it should look.
 - Images should be declared inside the `{figure}` environment.
- ```
\graphicspath{ {pathtofolder1}{pathtofolder2} }

\begin{figure}[float]
 \centering
 \includegraphics[figure alterations]{imagename}
\end{figure}
```
- PNG, JPG, PDF are all accepted. Other file types are as well, check google in case of doubts.
  - Multiple properties can be altered, check [en.wikibooks.org/wiki/LaTeX/Importing\\_Graphics](https://en.wikibooks.org/wiki/LaTeX/Importing_Graphics)

- Normalmente as figuras se estiverem na mesma pasta que o .tex ele vai lá buscar tudo
- Podem guardar noutra(s) pasta(s), pode dar jeito para arrumar os ficheiros
- Nome da figura não precisa de incluir extensão, mas convém
- Idem

## Lists and enumerations



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└ Introduction to  $\text{\LaTeX}$   
└ Lists and enumerations

Lists and enumerations



# How to make a list

- The `{itemize}` environment generates unnumbered lists.
- The `{enumerate}` environment generates numbered lists.
- Nested lists are very much possible.
- Items are identified by the `\item` command.

```
\begin{itemize}
```

```
\item First item of the unnumbered list
```

```
\begin{enumerate}
```

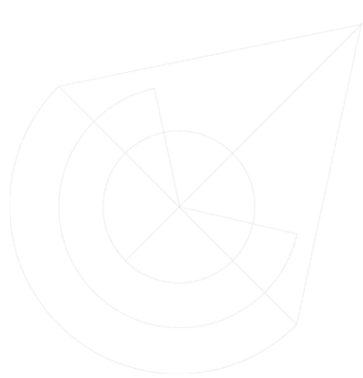
```
\item First item of the numbered sublist
```

```
\item Second item of the numbered sublist
```

```
\end{enumerate}
```

```
\item Second item of the unnumbered list
```

```
\end{itemize}
```



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

### └ Introduction to L<sup>A</sup>T<sub>E</sub>X

#### └ Lists and enumerations

##### └ How to make a list

- Idem

How to make a list

- The `{itemize}` environment generates unnumbered lists.
- The `{enumerate}` environment generates numbered lists.
- Nested lists are very much possible.
- Items are identified by the `\item` command.

```
\begin{itemize}
\item First item of the unnumbered list
\begin{enumerate}
\item First item of the numbered sublist
\item Second item of the numbered sublist
\end{enumerate}
\item Second item of the unnumbered list
\end{itemize}
```

## Equations and other math topics



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Mini-workshop  $\text{\LaTeX}$  and Git

└ Introduction to  $\text{\LaTeX}$

└ Equations and other math topics

Equations and other math topics

# Math environments

- Use the `{amsmath}` package.
- `$equation$` generates an inline equation, can be included in the middle of a sentence.
- `$$equation$$` generates a separated, centred equation.
- The `{equation}` environment generates numbered equations, this is the best option.

```
\begin{equation}
equation
\end{equation}
```

- A blank line inside a math environment causes a compilation error!

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## Mini-workshop $\text{\LaTeX}$ and Git

### └ Introduction to $\text{\LaTeX}$

#### └ Equations and other math topics

##### └ Math environments

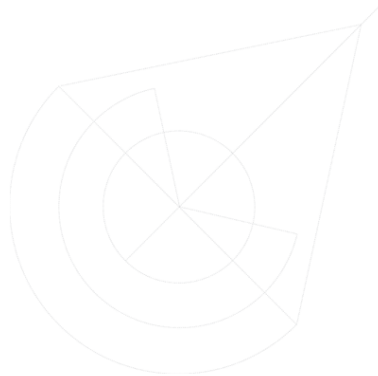
- Há vários ambientes matemáticos
- Há vários packages
- o *amsmath* tem tudo o que precisam normalmente
- `$$coisa$$` é parecido com o ambiente `equation`, mas não é numerado
- o ambiente é melhor

#### Math environments

- Use the `{amsmath}` package.
  - `$equation$` generates an inline equation, can be included in the middle of a sentence.
  - `$$equation$$` generates a separated, centred equation.
  - The `{equation}` environment generates numbered equations, this is the best option.
- ```
\begin{equation}  
equation  
\end{equation}
```
- A blank line inside a math environment causes a compilation error!

Greek letters and other special symbols

- You need to use the letter names in english.
 - `\alpha` writes α .
 - `\beta` writes β .
 - etc
- There are arrows and mathematical symbols
 - `\rightarrow` writes \rightarrow .
 - `\simeq` writes \simeq .
 - etc
- All of these symbols can only be used in a math environment.
- Check the list here en.wikibooks.org/wiki/LaTeX/Mathematics



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Mini-workshop \LaTeX and Git

└ Introduction to \LaTeX

└ Equations and other math topics

└ Greek letters and other special symbols

- Se quiserem usar um destes símbolos numa frase têm de usar os \$

Greek letters and other special symbols

• You need to use the letter names in english.

- `\alpha` writes α .

- `\beta` writes β .

- etc

• There are arrows and mathematical symbols

- `\rightarrow` writes \rightarrow .

- `\simeq` writes \simeq .

- etc

• All of these symbols can only be used in a math environment.

• Check the list here en.wikibooks.org/wiki/LaTeX/Mathematics

Fractions, parentheses and square roots

- Inside a math environment, it's declared as:

`\frac{numerator}{denominator}`

- You can have a parentheses with necessary size to envelop the fraction:

`\left(\frac{numerator}{denominator}\right)`

- This method for parentheses works with `[`, `{` e `"."`.
- Using `\left.something\right)` causes only the right parenthesis to be drawn.
- Having a mismatched number of `\left` or `\right` causes a compilation error!
- Roots envelop the whole radicand:

`\sqrt[index]{radicand}`

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Mini-workshop \LaTeX and Git

└ Introduction to \LaTeX

└ Equations and other math topics

└ Fractions, parentheses and square roots

- Explicar o que é o `\left`.
- Por cada `left` é preciso um `right`
- se não se meter o índice é uma raiz quadrada sem nada

Fractions, parentheses and square roots

```
• Inside a math environment, it's declared as:  
\frac{numerator}{denominator}  
• You can have a parentheses with necessary size to envelop the fraction:  
\left(\frac{numerator}{denominator}\right)  
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• Using \left.something\right) causes only the right parenthesis to be drawn.  
• Having a mismatched number of \left or \right causes a compilation error!  
• Roots envelop the whole radicand:  
\sqrt[index]{radicand}
```

Superscripts, subscripts, vectors and accents

- The `^` symbol puts things in superscript, this is how you write powers.

`basis{exponent}` \Rightarrow `basis`^{exponent}

- The `_` symbol puts things in subscript, this is how you write indices.

`basis_{subscript}` \Rightarrow `basis`_{subscript}

- Vectors are declared by the `\vec{}` command.

`\vec{v}` \Rightarrow \vec{v}

- For more, see en.wikibooks.org/wiki/LaTeX/Mathematics

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Mini-workshop L^AT_EX and Git

└ Introduction to L^AT_EX

└ Equations and other math topics

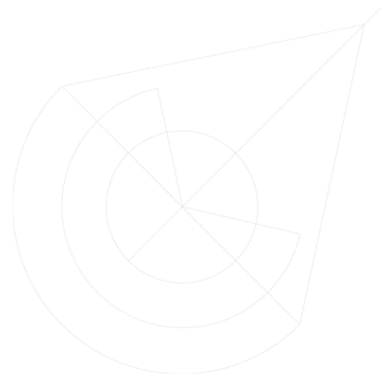
└ Superscripts, subscripts, vectors and accents

- Usar o `^` ou o `_` fora de ambiente matemático causa erro

Superscripts, subscripts, vectors and accents

- The `^` symbol puts things in superscript, this is how you write powers.
`basis{exponent}` \Rightarrow `basis`^{exponent}
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Referencing content



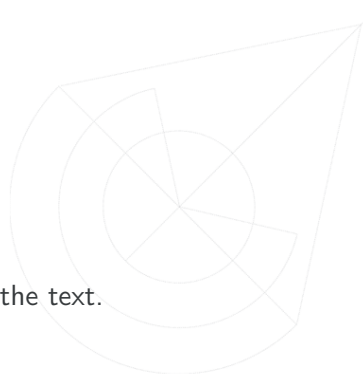
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Mini-workshop \LaTeX and Git
└ Introduction to \LaTeX
└ Referencing content

Referencing content

What is a reference?

- To call, by a number, some equation, figure or table.
- There are 3 different commands for this:
 - `\label{identificationtext}`
 - `\ref{identificationtext}`
 - `\eqref{equationidentificationtext}`
- You can call the reference before and after it appears in the text.
- \LaTeX deals with the pesky problem of numbering.



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Mini-workshop \LaTeX and Git

- └ Introduction to \LaTeX
 - └ Referencing content
 - └ What is a reference?

What is a reference?

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 - `\ref{identificationtext}`
 - `\eqref{equationidentificationtext}`
- You can call the reference before and after it appears in the text.
- \LaTeX deals with the pesky problem of numbering.

- Uma das grandes vantagens é o sistema de numeração, funciona bem
- Numeração é por ordem que são declarados
- Normalmente é preciso compilar 2x para as referências funcionarem depois de serem declaradas pela primeira vez ou serem alteradas. Tem a ver com os ficheiros auxiliares

Referencing equations

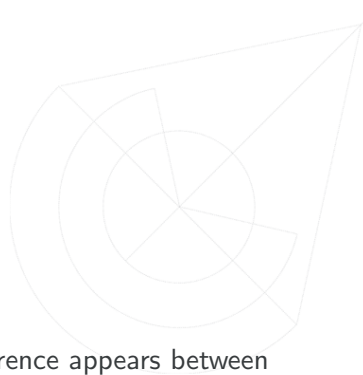
- Just add a label to the equation:

```
\begin{equation}\label{labeltext}  
equation content  
\end{equation}
```

- You then call the reference with the `\eqref` command:

"As demonstrated in relation `\eqref{labeltext}`..."

- This command is made especially for equations, the reference appears between parenthesis.



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Mini-workshop \LaTeX and Git

- Introduction to \LaTeX
 - Referencing content
 - Referencing equations

Referencing equations

- Just add a label to the equation:

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equation content  
\end{equation}
```

- You then call the reference with the `\eqref` command:

"As demonstrated in relation `\eqref{labeltext}`..."

- This command is made especially for equations, the reference appears between parenthesis.

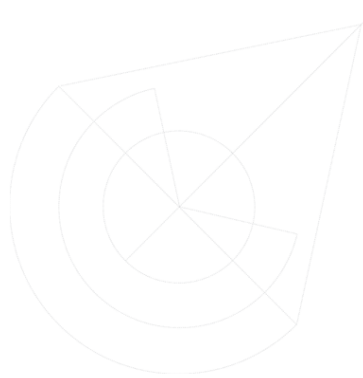
- idem

Referenciar tabelas e figuras

- The figure/table needs to have a caption.
- Just add a label to the figure/table.

```
\begin{table}[]  
\caption{legend}  
\label{labeltext}  
\begin{tabular}{c|cl}  
Table content...  
\end{tabular}  
\end{table}
```

- You then call the reference with the `\ref` command.
- Usually, table captions are placed above the table.



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Mini-workshop L^AT_EX and Git

- └ Introduction to L^AT_EX
 - └ Referencing content
 - └ Referenciar tabelas e figuras

- idem

Referenciar tabelas e figuras

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Table content...
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\end{table}
```
- You then call the reference with the `\ref` command.
  - Usually, table captions are placed above the table.

# Referenciar tabelas e figuras

- The figure/table needs to have a caption.
- Just add a label to the figure/table.

```
\begin{figure}[float]
```

```
\centering
```

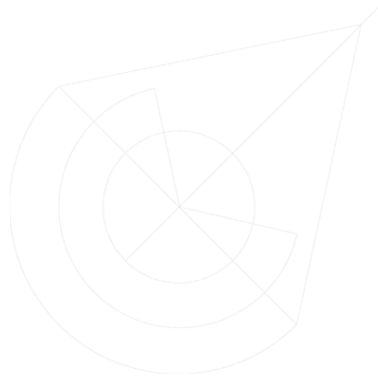
```
\includegraphics[...]{imagenname}
```

```
\caption{legend}
```

```
\label{labeltext}
```

```
\end{figure}
```

- You then call the reference with the `\ref` command.



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

### └ Introduction to L<sup>A</sup>T<sub>E</sub>X

### └ Referencing content

### └ Referenciar tabelas e figuras

- idem

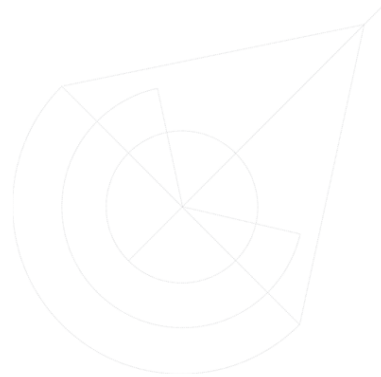
#### Referenciar tabelas e figuras

- The figure/table needs to have a caption.
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```
\begin{figure}[float]
\centering
\includegraphics[...]{imagenname}
\caption{legend}
\label{labeltext}
\end{figure}
```

- You then call the reference with the `\ref` command.

## Bibliographies and citations



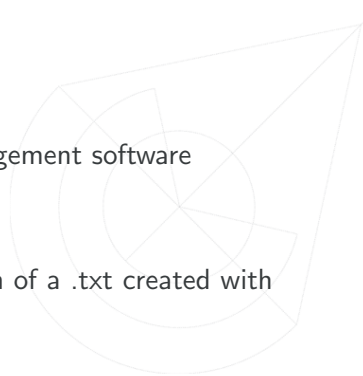
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Mini-workshop  $\text{\LaTeX}$  and Git  
└ Introduction to  $\text{\LaTeX}$   
└ Bibliographies and citations

Bibliographies and citations

# How to make a bibliography

- Easiest way is to have a .bib file.
- This file can be made by hand or with a reference management software (Mendeley, Bibdesk or other).
- I'll show you how to do it by hand.
- Generate a .bib file, somehow, by changing the extension of a .txt created with notepad, for example.
- Go get the reference text and copy it into the .bib file.



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## Mini-workshop $\text{\LaTeX}$ and Git

### └ Introduction to $\text{\LaTeX}$

### └ Bibliographies and citations

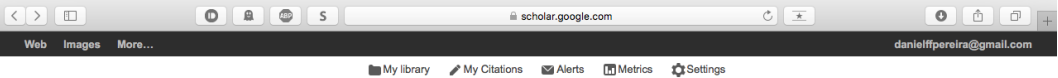
### └ How to make a bibliography

- Podem declarar a bibliografia dentro do .tex, mas assim é mais fácil
- Agora mostro-vos onde ir buscar um texto de referência facilmente

How to make a bibliography

- Easiest way is to have a .bib file.
- This file can be made by hand or with a reference management software (Mendeley, Bibdesk or other).
- I'll show you how to do it by hand.
- Generate a .bib file, somehow, by changing the extension of a .txt created with notepad, for example.
- Go get the reference text and copy it into the .bib file.

# Where to get references



On the Electrodynamics of Moving Bodies



☒ Articles ☒ include patents ☐ Case law

Stand on the shoulders of giants

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- Mini-workshop  $\text{\LaTeX}$  and Git
  - Introduction to  $\text{\LaTeX}$ 
    - Bibliographies and citations
      - Where to get references



# Where to get references

# Where to get references

The screenshot shows a Google Scholar search for "On the Electrodynamics of Moving Bodies". The search results list the article by Albert Einstein (1905). A "Cite" dialog box is open, displaying various citation formats:

- MLA: Einstein, Albert. "On the electrodynamics of moving bodies." (1905).
- APA: Einstein, A. (1905). On the electrodynamics of moving bodies.
- Chicago: Einstein, Albert. "On the electrodynamics of moving bodies." (1905).
- Harvard: Einstein, A., 1905. On the electrodynamics of moving bodies.
- Vancouver: Einstein A. On the electrodynamics of moving bodies.

At the bottom of the dialog box, there are links to "BibTeX", "EndNote", "RefMan", and "RefWorks".

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- Mini-workshop  $\text{\LaTeX}$  and Git
  - Introduction to  $\text{\LaTeX}$
  - Bibliographies and citations
    - Where to get references





# Where to get references

<>📖

🔍👤🌐S

scholar.googleusercontent.com

🔄🌟🕒📄📄+

```
@article{einstein1905electrodynamics,
 title={On the electrodynamics of moving bodies},
 author={Einstein, Albert},
 year={1905}
}
```

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  - Introduction to  $\text{\LaTeX}$ 
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      - Where to get references

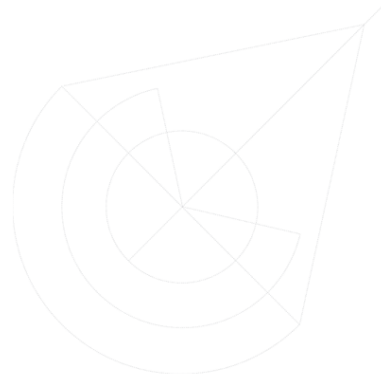


# Understanding the citation text

```
@article{einstein1905electrodynamics,
 title={On the electrodynamics of moving bodies},
 author={Einstein, Albert},
 year={1905}
}
```

- Different publications want different formats.

```
@typeofsource{citetext,
 title={Source title},
 author={Authors},
 year={Publication year}
}
```



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

### └ Introduction to L<sup>A</sup>T<sub>E</sub>X

### └ Bibliographies and citations

### └ Understanding the citation text

Understanding the citation text

```
@article{einstein1905electrodynamics,
 title={On the electrodynamics of moving bodies},
 author={Einstein, Albert},
 year={1905}
}

% Different publications want different formats.

@typeofsource{citetext,
 title={Source title},
 author={Authors},
 year={Publication year}
}
```

- Há muitas mais informações que podem vir com a referência
- Podem por exemplo querer só a inicial do primeiro nome dos autores.

# How to insert the bibliography in the document

- After preparing a .bib file, you need to feed it to  $\text{\LaTeX}$ .

`\bibliography{bibliography}`

- There are different styles of bibliographies, they change the way things are presented.

`\bibliographystyle{plain}`

- By default,  $\text{\LaTeX}$  only includes cited sources in the bibliography, if you want uncited sources to be included, use the code:

`\nocite{*}`

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## Mini-workshop $\text{\LaTeX}$ and Git

### └ Introduction to $\text{\LaTeX}$

### └ Bibliographies and citations

### └ How to insert the bibliography in the document

- idem
- há vários estilos, se o texto está em itálico por exemplo.
- só têm de se preocupar com o style se forem escrever para uma revista

How to insert the bibliography in the document

• After preparing a .bib file, you need to feed it to  $\text{\LaTeX}$ .

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# How to cite a source

- After having included the bibliography in the document, this is cited with the `\cite{citetext}` command.
- If you wish to cite multiple sources at the same time, do:  
`\cite{citetext1,citetext2,citetext3,...}`
- For more, see [en.wikibooks.org/wiki/LaTeX/Bibliography\\_Management](https://en.wikibooks.org/wiki/LaTeX/Bibliography_Management)

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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- └ Introduction to L<sup>A</sup>T<sub>E</sub>X
  - └ Bibliographies and citations
    - └ How to cite a source

- idem

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This concludes the  $\text{\LaTeX}$ mini-workshop

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Mini-workshop  $\text{\LaTeX}$ and Git

└ Introduction to  $\text{\LaTeX}$

└ This concludes the  $\text{\LaTeX}$ mini-workshop

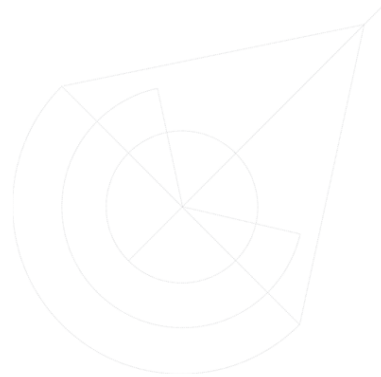
This concludes the  $\text{\LaTeX}$ mini-workshop

- Any questions

# Introduction to Git



# Intro



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Mini-workshop  $\text{\LaTeX}$  and Git  
└─ Introduction to Git  
   └─ Intro

Intro

# Initial notions

- What is it?
  - A database control and sharing system.
- GitHub is a very popular option, it's free and open. Create an account on GitHub.
- You need to install the git distribution.
  - Windows: [gitforwindows.org](https://gitforwindows.org)
  - Mac: [sourceforge.net/projects/git-osx-installer/files/](https://sourceforge.net/projects/git-osx-installer/files/)
  - Linux: run the following code in the console (this should work for most distros)

`sudo apt-get update`

`sudo apt-get install git`

- You should use a Git client:
  - GitKraken: [www.gitkraken.com/git-client](http://www.gitkraken.com/git-client)
  - GitHub Desktop: [desktop.github.com](https://desktop.github.com)

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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

### └ Introduction to Git

#### └┐ Intro

#### └┐ Initial notions

- Git actually can run from the command line
- Using it that way is not a good idea for beginners
- You are going to use GitHub, so use GitHub Desktop client
- The practical explanations presented in the rest of this workshop assume you are using GitHub Desktop client
- SO USE OTHER CLIENTS AT YOUR OWN RISK

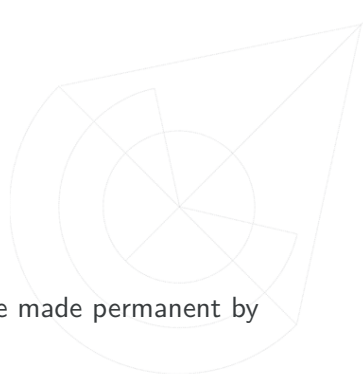
#### Initial notions

- What is it?
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    - GitHub Desktop: [desktop.github.com](https://desktop.github.com)



# What is a repository

- A repository is a data structure that:
  - Stores a set of files and/or a directory structure.
  - A historical record of the changes to those files.
- The main repository lives somewhere in a server.
- You can **clone** a copy of the repository to your PC.
- Changes are made locally to the cloned repository can be made permanent by **committing** to it.
- Changes can then be **pushed** to the external repository.
- If you are working on another computer, you can then **pull** the changes from the external repository.



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

### └ Introduction to Git

#### └└ Intro

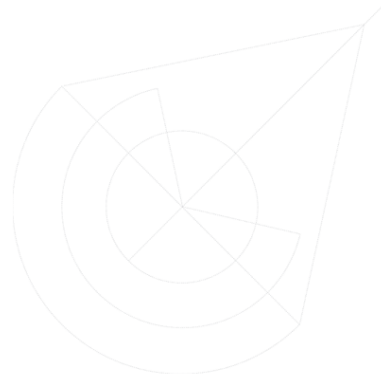
#### └└└ What is a repository

#### What is a repository

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- Changes can then be **pushed** to the external repository.
- If you are working on another computer, you can then **pull** the changes from the external repository.

- Similar to Dropbox or OneDrive, but it only uploads when you tell it to
- Read slide and explain line by line
- For the work in this class you will be working on a repository that already exists, but it belongs to someone else, so... NEXT SLIDE

## Forking repositories



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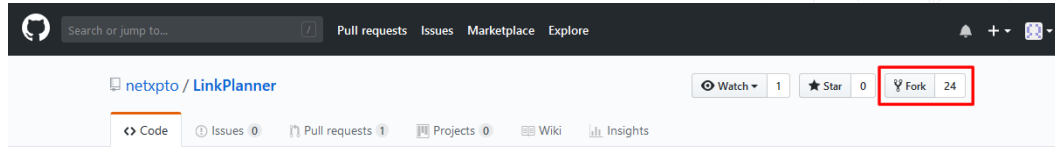
Mini-workshop  $\text{\LaTeX}$  and Git

- └ Introduction to Git
- └ Forking repositories

Forking repositories

# What the fork?

- A fork is a copy of another repository.
- In the GitHub website, navigate to the repository you want to fork.



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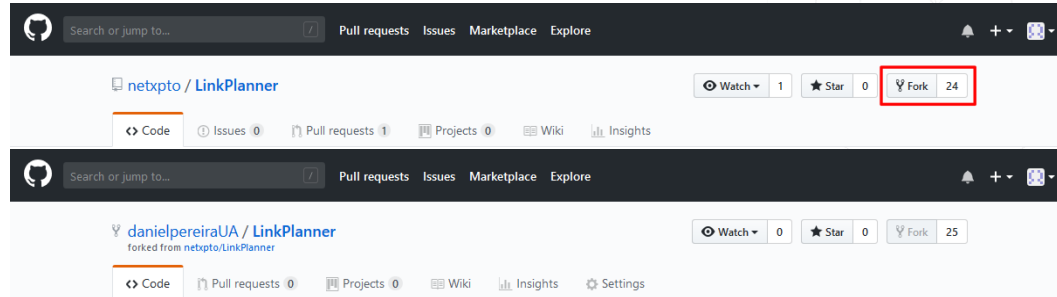
- └ Introduction to Git
  - └ Forking repositories
    - └ What the fork?



- A fork is a copy of someone's repository to your account
- You can't change someone else's repository directly, but you can change your fork of it as much as you want
- Click on the Fork button and... NEXT SLIDE

# How to fork a repository

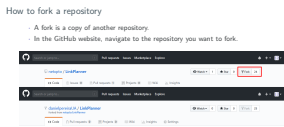
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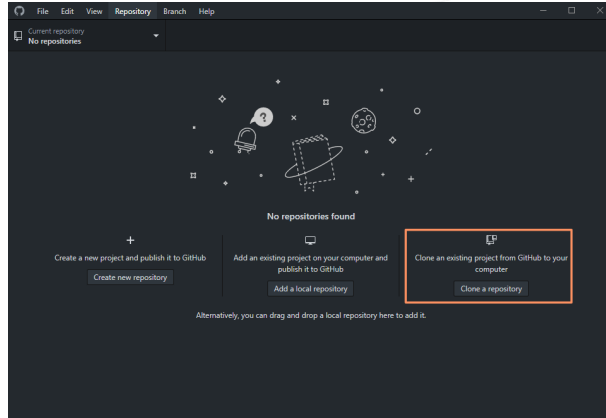
- └ Introduction to Git
  - └ Forking repositories
    - └ How to fork a repository



- This is your fork
- Point out the usernames in the figure
- Now you want to work on your fork, alter files and such, so you... NEXT SLIDE

# How to clone your fork

- This is not the only way to do it, but it is the easiest.
- In the GitHub Desktop app, choose to *clone a repository*.



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- └ Introduction to Git
  - └ Forking repositories
    - └ How to clone your fork

- ... clone your fork to your machine
- you can do this in multiple ways, do it this way to be simpler
- click on clone a repository... NEXT SLIDE

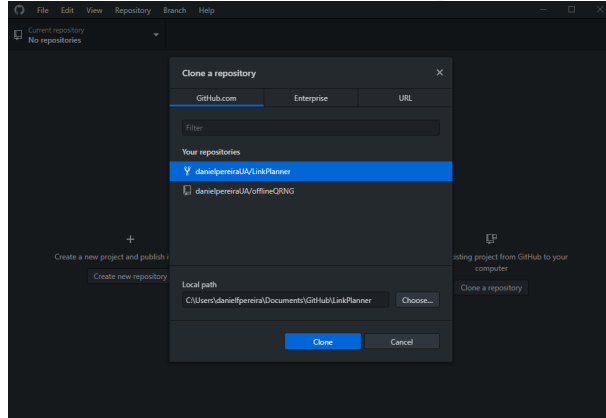
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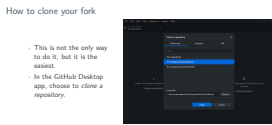


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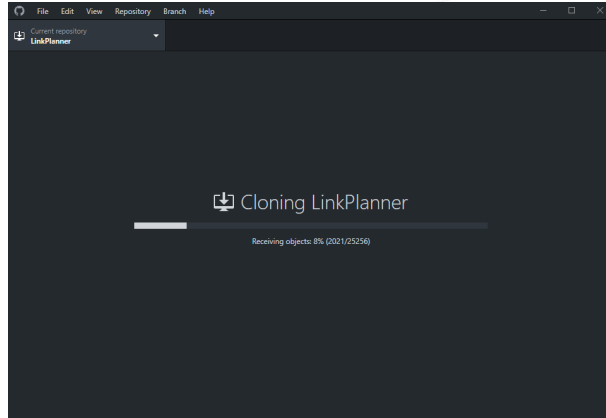
- └ Introduction to Git
  - └ Forking repositories
    - └ How to clone your fork

- this shows a list of the repositories associated to your GitHub account
- point out they can choose the path to where it will download the files
- choose the one you want to clone and... NEXT SLIDE



# How to clone your fork

- This is not the only way to do it, but it is the easiest.
- In the GitHub Desktop app, choose to *clone a repository*.
- Then you just have wait while it downloads, may take a while.



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- └ Introduction to Git
  - └ Forking repositories
    - └ How to clone your fork

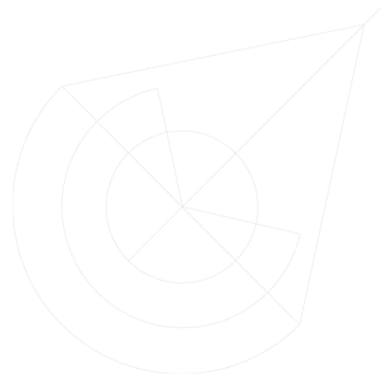
- just wait

How to clone your fork

- This is not the only way to do it, but it is the easiest.
- In the GitHub Desktop app, choose to clone a repository.
- Then you just have wait while it downloads, may take a while.



## Working inside your fork



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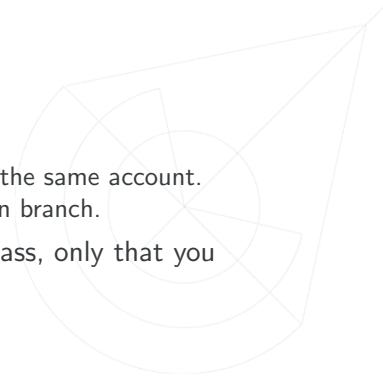
Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git  
└ Introduction to Git  
  └ Working inside your fork

Working inside your fork



# Branches

- What is a branch?
  - You can see it as a split of a repository inside it.
  - While a fork is to another account, a branch remains in the same account.
  - Allows code to be tested before it is included in the main branch.
- You won't have to worry about branches much in this class, only that you work on the branch allotted to you.



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

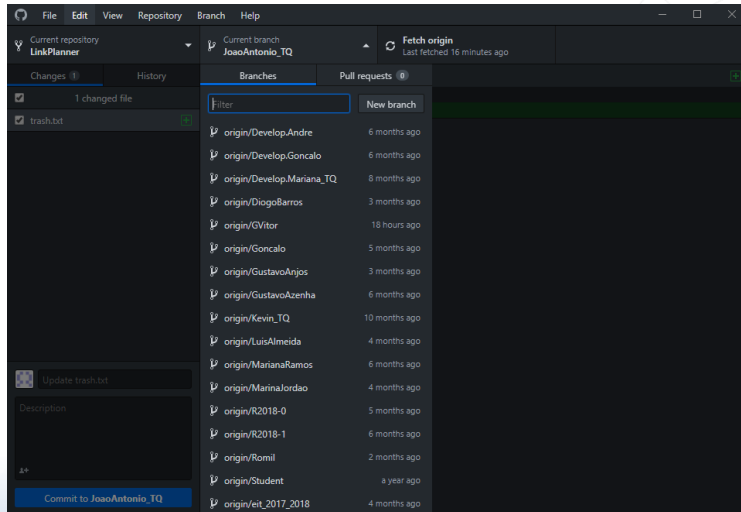
- └ Introduction to Git
  - └ Working inside your fork
    - └ Branches

Branches

- What is a branch?
  - You can see it as a split of a repository inside it.
  - While a fork is to another account, a branch remains in the same account.
  - Allows code to be tested before it is included in the main branch.
- You won't have to worry about branches much in this class, only that you work on the branch allotted to you.

- before you do anything, make sure you are working on the branch allotted to you

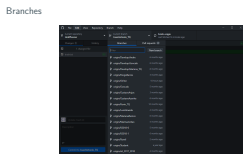
# Branches



2019-04-01

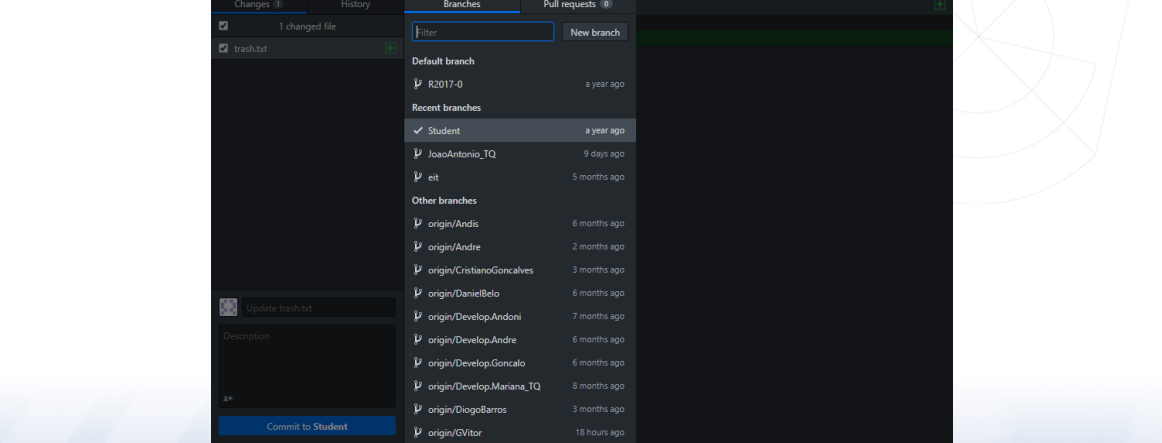
## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- Introduction to Git
  - Working inside your fork
    - Branches



- before you do anything, make sure you are working on the branch allotted to you
- there are only branches with origin/... in the branch name means that it is not yet listed on your fork however... NEXT SLIDE

# Branches



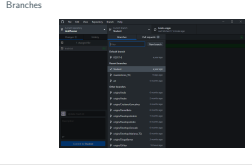
2019-04-01

## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- └ Introduction to Git

- Working inside your fork

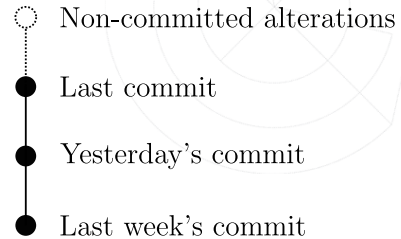
- Branches



- after the first selection, it is included in your fork, use this version from then on

# Committing, pushing and pulling

- Alterations made on your **clone** (that lives on your computer) can be made “official” by *committing* to them.
- You can discard changes by *checking out* the version of the latest commit. You can even **check out** a version of a file from any previous commit.
- The alterations you make this way are local to your machine, you need to **push** them to your “cloud” repository.
- If you wish to work on your repository on another machine, you will need to **pull** the latest version from the “cloud” repository.



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- └ Introduction to Git
  - └ Working inside your fork
    - └ Committing, pushing and pulling

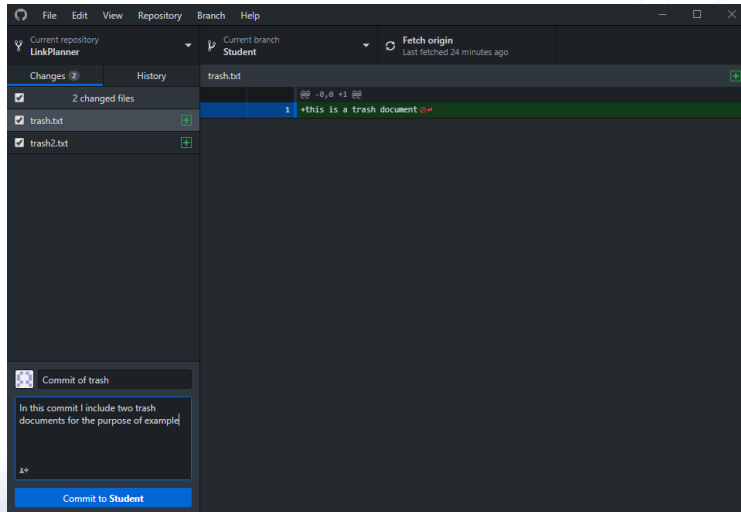
- You can now freely work on your clone of your fork of the original repository
- Checking out files from previous commits is not the easiest thing you can do, don't do it lightly.

Committing, pushing and pulling

- Alterations made on your **clone** (that lives on your computer) can be made “official” by committing to them.
- You can discard changes by *checking out* the version of the latest commit. You can even **check out** a version of a file from any previous commit.
- The alterations you make this way are local to your machine, you need to **push** them to your “cloud” repository.
- If you wish to work on your repository on another machine, you will need to **pull** the latest version from the “cloud” repository.

Non-committed alterations  
Last commit  
Yesterday's commit  
Last week's commit

# Committing, pushing and pulling



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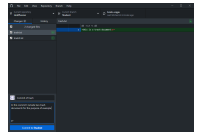
## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

### └ Introduction to Git

### └ Working inside your fork

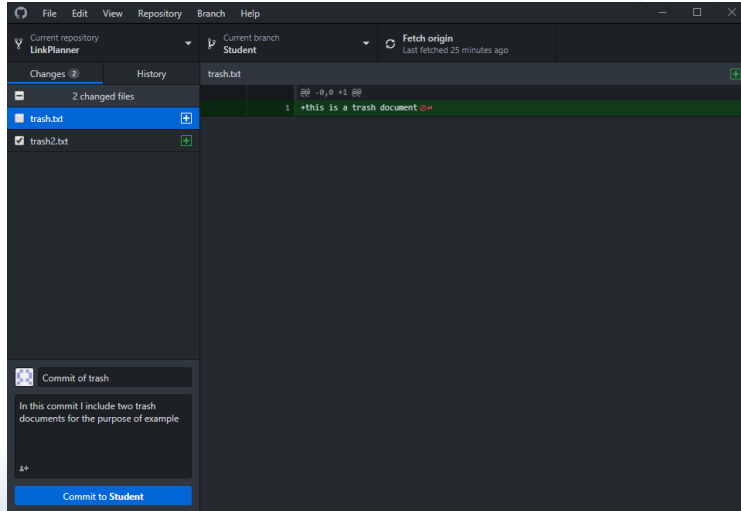
### └ Committing, pushing and pulling

Committing, pushing and pulling



- here I have 2 different changes that I haven't committed yet
- You need to write a summary (point to it) and a description of the changes you made.
- After that click commit.

# Committing, pushing and pulling

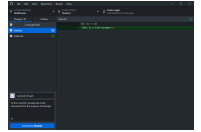


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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

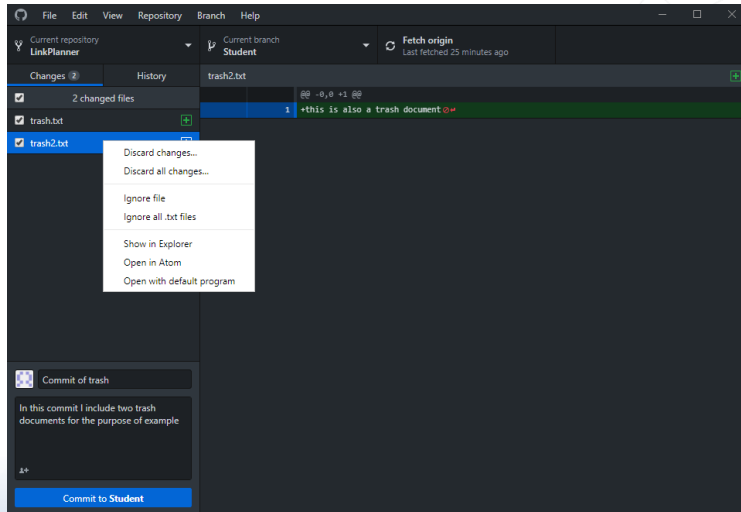
- └ Introduction to Git
  - └ Working inside your fork
    - └ Committing, pushing and pulling

Committing, pushing and pulling



- I can choose not to include some files in the commit, these can be committed at a later stage or discarded.
- Point to the checkmarks.

# Committing, pushing and pulling



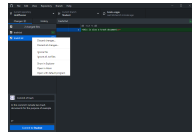
2019-04-01

## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

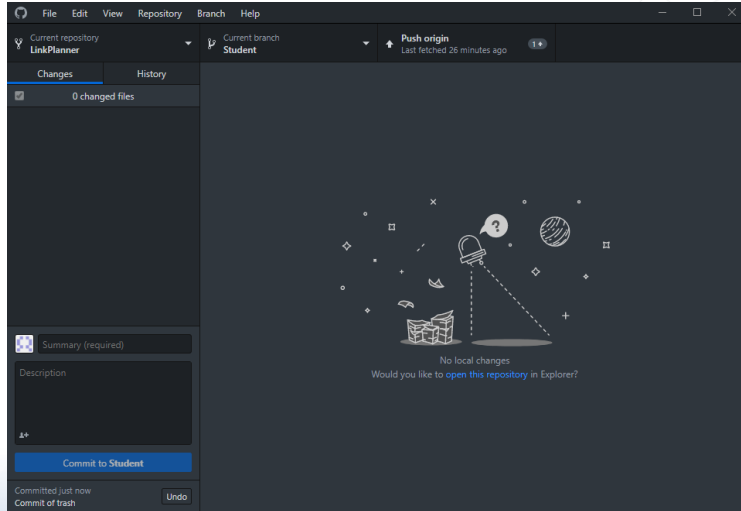
- └ Introduction to Git
  - └ Working inside your fork
    - └ Committing, pushing and pulling

- The discarding options appear if you right click the changes.

Committing, pushing and pulling



# Committing, pushing and pulling

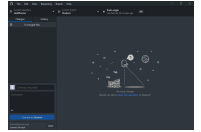


2019-04-01

## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- └ Introduction to Git
  - └ Working inside your fork
    - └ Committing, pushing and pulling

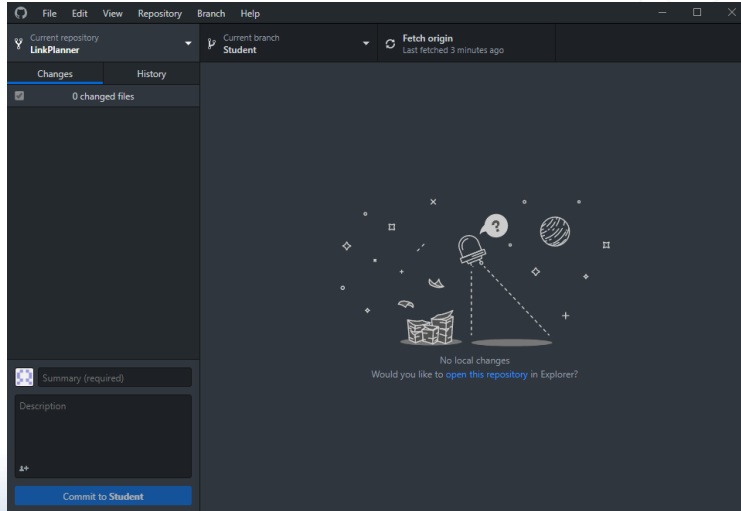
Committing, pushing and pulling



- After you commit, you need to push those changes to the cloud... NEXT SLIDE



# Committing, pushing and pulling



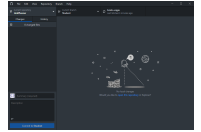
2019-04-01

## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

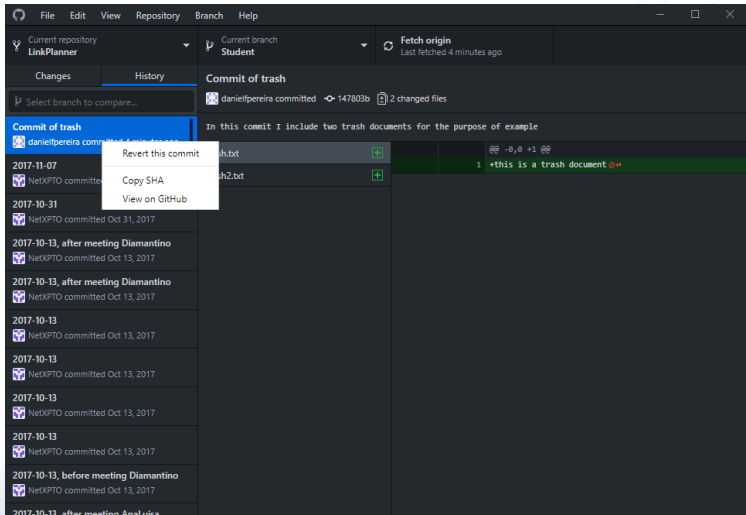
- └ Introduction to Git
  - └ Working inside your fork
    - └ Committing, pushing and pulling

- This is what it looks like after pushing

Committing, pushing and pulling



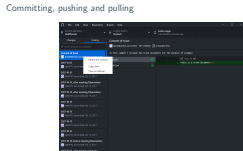
# Committing, pushing and pulling



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- └ Introduction to Git
  - └ Working inside your fork
    - └ Committing, pushing and pulling



- You revert a commit from the history tab

## Communicating between forks



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Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

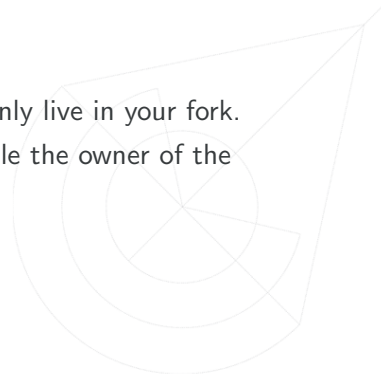
└ Introduction to Git

└ Communicating between forks

Communicating between forks

# Pull requests

- The alterations you made and pushed to your account only live in your fork.
- If you want to share them with someone else (for example the owner of the original repository) you need to open a pull request.



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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

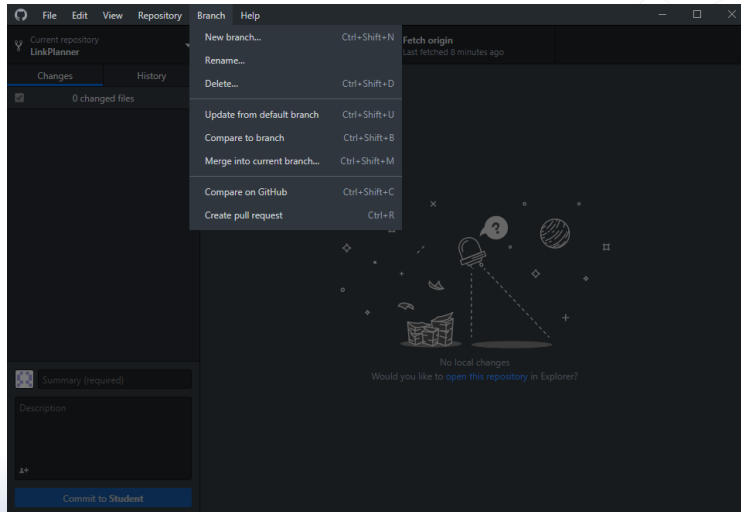
- └ Introduction to Git
  - └ Communicating between forks
    - └ Pull requests

Pull requests

- The alterations you made and pushed to your account only live in your fork.
- If you want to share them with someone else (for example the owner of the original repository) you need to open a pull request.

- After you committed and pushed your alterations, if you want to share your alterations, you need to request a pull from your account to theirs

# Pull requests



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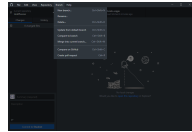
## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

└ Introduction to Git

└ Communicating between forks

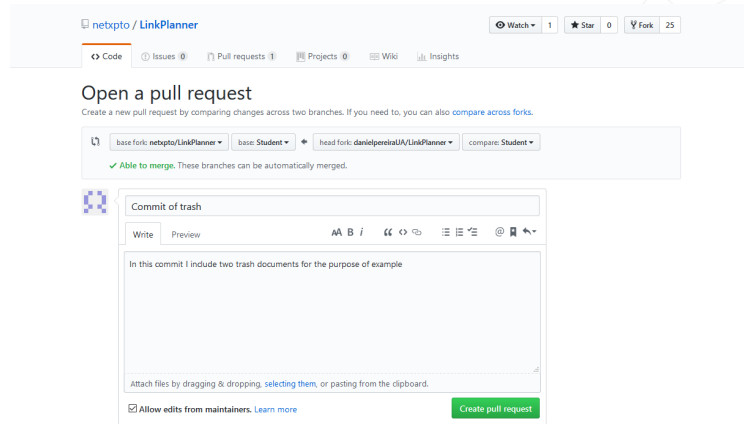
└ Pull requests

Pull requests



- Go here on the desktop app, click Create pull request, this takes you to... NEXT SLIDE

# Pull requests



netxpto / LinkPlanner

Watch 1 Star 0 Fork 25

Code Issues 0 Pull requests 1 Projects 0 Wiki Insights

## Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also [compare across forks](#).

base fork: netxpto/LinkPlanner base: Student head fork: danielpereiraUA/LinkPlanner compare: Student

✓ **Able to merge.** These branches can be automatically merged.

Commit of trash

Write Preview

In this commit I include two trash documents for the purpose of example

Attach files by dragging & dropping, [selecting them](#), or pasting from the clipboard.

☒ Allow edits from maintainers. [Learn more](#)

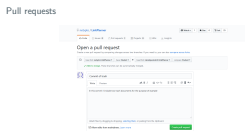
Create pull request

2019-04-01

## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- Introduction to Git
  - Communicating between forks
    - Pull requests

- The website...
- Note the arrow, its direction
- Note the branches and forks on each side
- if you did everything right, it should say Able to merge, else it will tell you there are conflicts
- I'll explain what conflicts are after



# Pull requests

- The alterations you made and pushed to your account only live in your fork.
- If you want to share them with someone else (for example the owner of the original repository) you need to open a pull request.
- The owner of the repository you are requesting the pull to needs to approve it before it actually happens.

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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

### └ Introduction to Git

### └ Communicating between forks

### └ Pull requests


- the owner of the repository being pulled to needs to authorize, he'll have to deal with the conflicts

Pull requests

- The alterations you made and pushed to your account only live in your fork.
- If you want to share them with someone else (for example the owner of the original repository) you need to open a pull request.
- The owner of the repository you are requesting the pull to needs to approve it before it actually happens.

# Pull requests

- The alterations you made and pushed to your account only live in your fork.
- If you want to share them with another fork of the same repository (for example original repository) you need to open a pull request.
- The owner of the repository you are requesting the pull to needs to approve it before it actually happens.
- Now say you want to update your fork from another fork of the same repository (for example, from the original repository).
- You do the reverse of what you did previously.
- Create a pull request from the fork you want to pull from into your fork.

 base fork: danielpereiraUA/LinkPlanner ▾

base: Student ▾

↔

head fork: netxpto/LinkPlanner ▾

compare: Student ▾

2019-04-01

## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

### └ Introduction to Git

### └ Communicating between forks

### └ Pull requests

- now if you want to update your fork from an external fork, you do the same as before
- note the arrow
- Note the branches and forks on each side


Pull requests

- The alterations you made and pushed to your account only live in your fork.
- If you want to share them with another fork of the same repository (for example original repository) you need to open a pull request.
- The owner of the repository you are requesting the pull to needs to approve it before it actually happens.
- Now say you want to update your fork from another fork of the same repository (for example, from the original repository).
- You do the reverse of what you did previously.
- Create a pull request from the fork you want to pull from into your fork.

13 base fork: danielpereiraUA/LinkPlanner • base: Student • head fork: netxpto/LinkPlanner • compare: Student



# Pull requests

 danielpereiraUA / LinkPlanner

forked from netxpto/LinkPlanner

Watch 0

Star 0

Fork 25

Code

Pull requests 0

Projects 0

Wiki

Insights

Settings

Initial upload

Edit

Manage topics

791 commits

25 branches

0 releases

10 contributors

Branch: R2017-0

New pull request

Create new file

Upload files

Find file

Clone or download

This branch is even with netxpto:R2017-0.

Pull request

Compare

netxpto 2017-11-07

Latest commit cadabbe on Nov 7, 2017

doc/tex

2017-11-07

a year ago

include

2017-10-13, before meeting Diamantino

a year ago

lib

2017-10-13, after meeting Diamantino

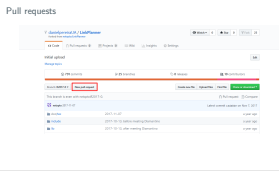
a year ago

2019-04-01

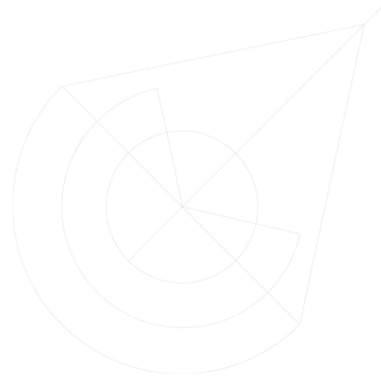
## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- Introduction to Git
  - Communicating between forks
    - Pull requests

- to get there, go to your repository's page and click here



What if things go wrong?



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Mini-workshop  $\text{\LaTeX}$  and Git  
└ Introduction to Git  
└ What if things go wrong?

What if things go wrong?

# Conflicts

- A conflict arises when:
  - Change a file on PC A, push it to the cloud.
  - Change the same file on PC B before pulling the changes made on PC A.
  - When you then try to pull/push the changes made on PC A/B, you will have a conflict.
- Git knows you made changes on both machines, it even knows what changes you made in which.
- It needs you to tell it what changes to accept and what changes to discard.
- This is called merging.

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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

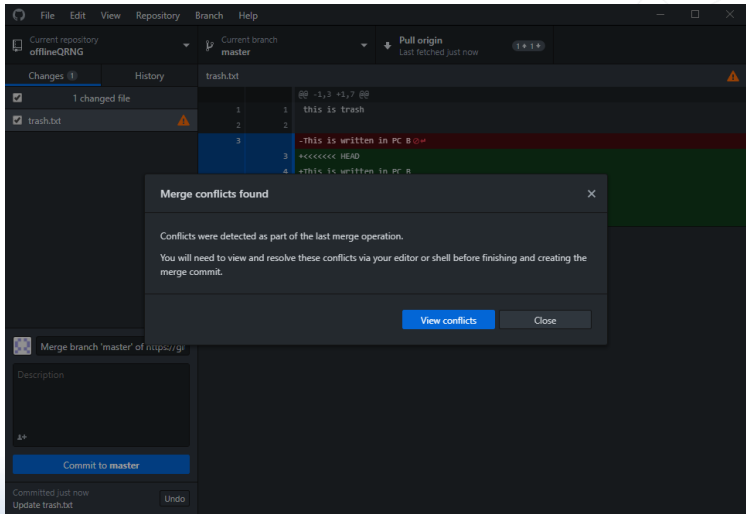
- └ Introduction to Git
  - └ What if things go wrong?
    - └ Conflicts

- what is a conflict?
- just follow the slide

Conflicts

- A conflict arises when:
  - Change a file on PC A, push it to the cloud.
  - Change the same file on PC B before pulling the changes made on PC A.
  - When you then try to pull/push the changes made on PC A/B, you will have a conflict.
- Git knows you made changes on both machines, it even knows what changes you made in which.
- It needs you to tell it what changes to accept and what changes to discard.
- This is called merging.

# Conflicts

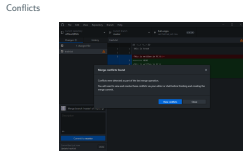


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## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- Introduction to Git
  - What if things go wrong?
    - Conflicts

- this is what the app will tell you
- note the danger logo
- there is a conflict on one file

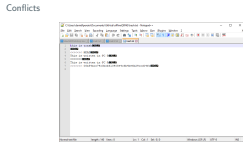


# Conflicts

```
1 this is trash
2 CR LF
3 <<<<<< HEAD
4 This is written in PC B
5 =====
6 This is written in PC A
7 >>>>>> 06a54acc74c0bcb613408e4c6b4be6b29ccd04fc
8
```

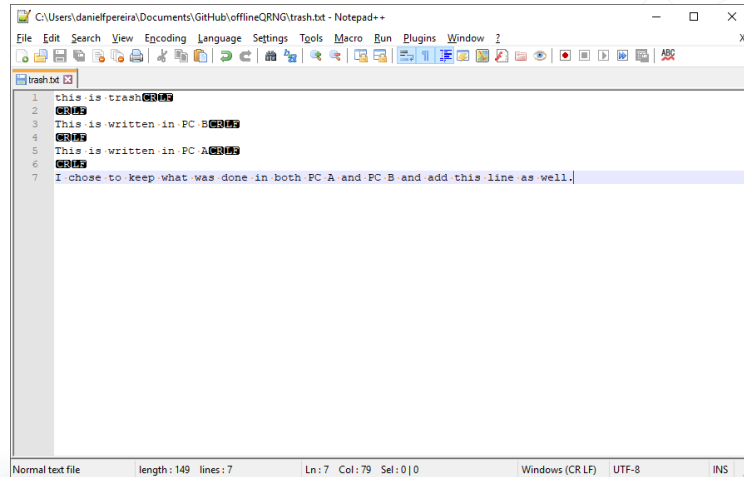
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- Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git
  - Introduction to Git
    - What if things go wrong?
      - Conflicts



- I am working on PC B
- Everything above the ===== line is what I have done in PC B
- Everything below the ===== line is what is in the cloud
- The text in the end identifies the commit in which what was in the cloud was added

# Conflicts

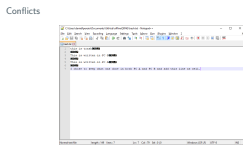


```
C:\Users\danielpereira\Documents\GitHub\offlineQRNG\trash.txt - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
trash.txt
1 this is trash
2
3 This is written in PC-B
4
5 This is written in PC-A
6
7 I chose to keep what was done in both PC-A and PC-B and add this line as well.
```

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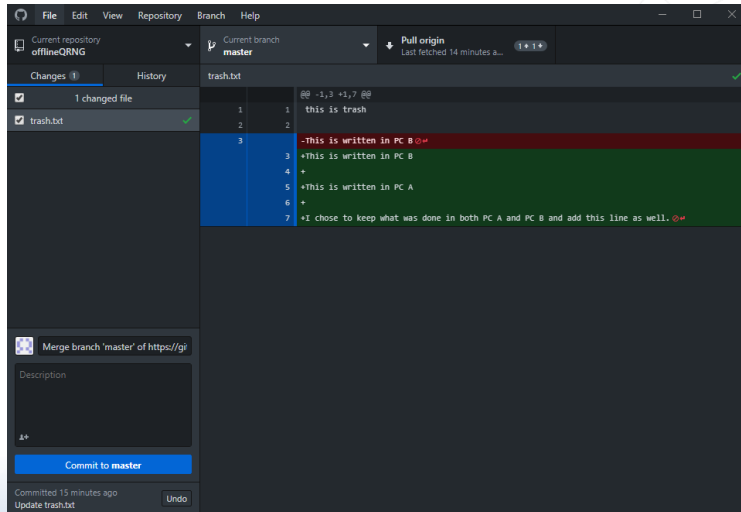
## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- Introduction to Git
  - What if things go wrong?
    - Conflicts



- this is what a conflict solution may look like
- you may want to delete one of the versions
- you can write anything you want

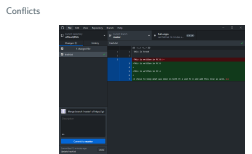
# Conflicts



2019-04-01

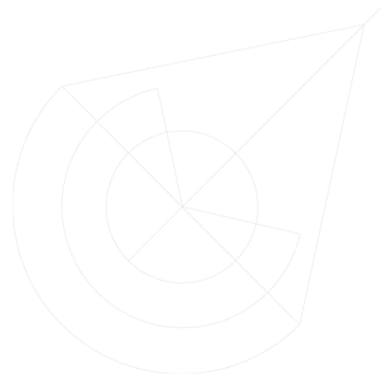
## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

- Introduction to Git
  - What if things go wrong?
    - Conflicts



- after the conflict has been solved
- note the danger logo is gone
- note the summary: it is automatically filled in by the app, you can change it if you want but I don't recommend it

# Summary



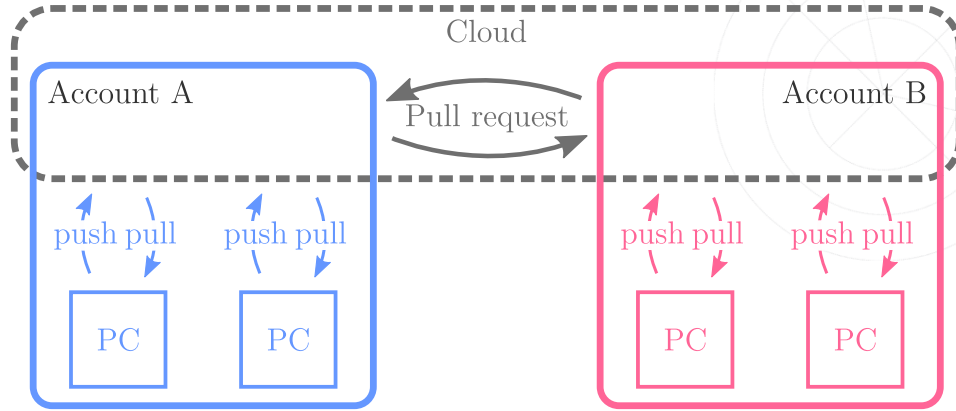
2019-04-01

Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git  
└─ Introduction to Git  
└─ Summary

Summary



# Topology of communications



2019-04-01

## Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git

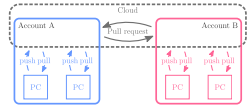
└ Introduction to Git

└ Summary

└ Topology of communications

- explain the whole figure

Topology of communications



This concludes the Git mini-workshop

2019-04-01

Mini-workshop L<sup>A</sup>T<sub>E</sub>X and Git  
└ Introduction to Git  
  └ This concludes the Git mini-workshop

This concludes the Git mini-workshop

- Any questions?

The end!

