

L^AT_EX Made Easy with Overleaf!

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What is Overleaf?

Online resource for creating and maintaining \LaTeX documents with lots of cool features.

- Real-time updates for document editor
- Dropbox capabilities
- Collaboration
- Github compatibility (new)

Why Use Overleaf?

- Organized and user-friendly.
- Microsoft Word is easier, so it's better, right?
 - No.

Microsoft Word Version (very lame)

$$\lim \left[1 + \frac{a}{n} + o(n^{-1}) \right]^n = e^a$$


L^AT_EX Version (very **awesome!**)

$$\lim_{n \rightarrow \infty} \left[1 + \frac{a}{n} + o\left(n^{-1}\right) \right]^n = e^a$$

How to Use Overleaf

- Find a template you like → “Open a Copy”/“Rename”

My Projects


NEW PROJECT 

Active 95











- ★ Starred 8
- 🗳 Archived 1
- 🗑 Trash 0

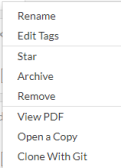
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LaTeX Cheat Sheet v2.0 Edited about 18 hours ago by Brady Rippon	11592228...jjq	   
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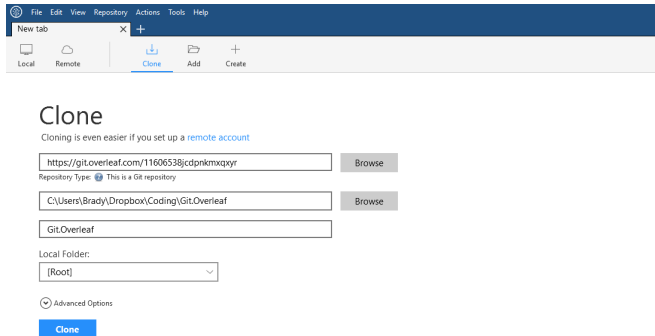


- Rename
- Edit Tags
- Star
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- Remove
- View PDF
- Open a Copy
- Clone With Git



Collaboration with Github (Step #1)

- Use “Clone With Git” to get Overleaf Tex URL.
- Create repository from clone in Git client (SourceTree).




Collaboration with Github (Step #2)

- Create new repository directly on GitHub.

Create a new repository


A repository contains all the files for your project, including the revision history.


Owner Repository name

 BradyRippon ▾ / ✓

Great repository names are short and memorable. Need inspiration? [How about jubilant-broccoli.](#)

Description (optional)

 **Public**
Anyone can see this repository. You choose who can commit.

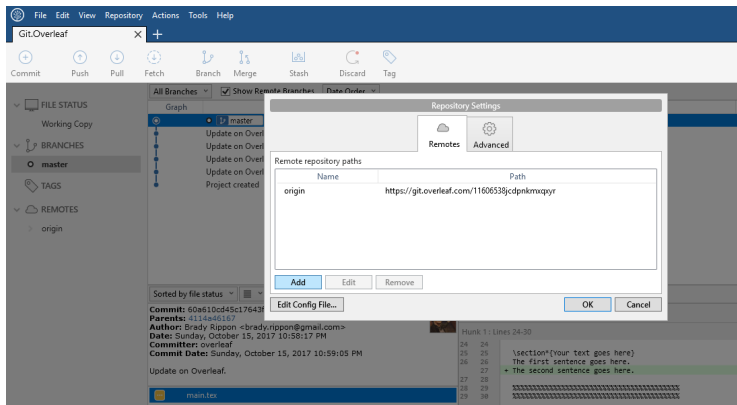
 **Private**
You choose who can see and commit to this repository.

Initialize this repository with a README
This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

Add .gitignore: ▾ Add a license: ▾ [?](#)

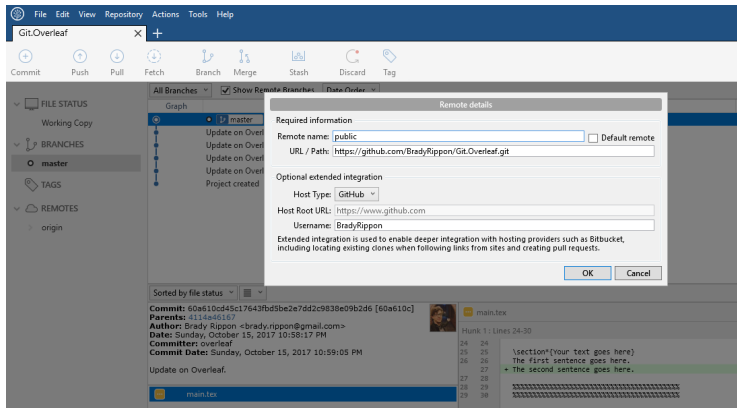
Collaboration with Github (Step #3)

- In the Settings tab of your client (SourceTree) repository, add a new repository.



Collaboration with Github (Step #4)

- Set new repository path as URL for GitHub repository.



Collaboration with GitHub

Workflow

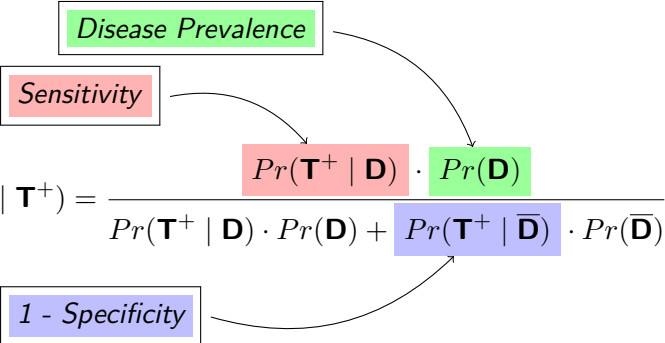
- Edit document directly on Overleaf.
- Pull changes from Overleaf repository from Git client (SourceTree).
- Push changes to shared GitHub repository.
- Pull collaborator changes from GitHub repository.

Note: Collaborators can now use local versions of \LaTeX while you work online with Overleaf!

Some Cool Examples of \LaTeX !

Colored Diagrams

Recall the equation for Bayes' Theorem:


$$Pr(\mathbf{D} | \mathbf{T}^+) = \frac{Pr(\mathbf{T}^+ | \mathbf{D}) \cdot Pr(\mathbf{D})}{Pr(\mathbf{T}^+ | \mathbf{D}) \cdot Pr(\mathbf{D}) + Pr(\mathbf{T}^+ | \bar{\mathbf{D}}) \cdot Pr(\bar{\mathbf{D}})}$$

Fancy 2x2 Tables

A new study is investigating the effects of smoking on developing a cold. Researchers collect an appropriate sample and collected the following data:

	EXPOSURE		
DISEASE	Smoker (+)	Smoker (-)	
Cold	587	402	989
No Cold	2,743	2,578	5,321
	3,330	2,980	6,310

Diagrams (One Sample Testing)

- The research is only testing **one sample** of subjects
- What data do we have?

We know σ

$$z = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}} \sim N(0, 1)$$

We only know s

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}} \sim t_{n-1}$$

- Look up appropriate probabilities in **z-table** or **t-table**.
- Make a conclusion to your test that matches your results!

Diagrams (Two Sample Testing)

- The research is comparing **two samples** of subjects.
- What data do we have? *May only know s_1, s_2*

We know σ_1 and σ_2

Test: $\sigma_1 = \sigma_2$

Test: $\sigma_1 \neq \sigma_2$

$$z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \sim t_{n_1+n_2-2}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \sim t_{d''}$$

- **Note:** $s_p = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$ and d'' is known

ANOVA (3+ Sample Testing)

Source	df	SS	MS
Treatment	$k - 1$	$\sum_{i=1}^k n_i (\bar{x}_i - \bar{x})^2$	SST / $(k - 1)$
Error	$N - k$	$\sum_{i=1}^k \sum_{j=1}^{n_i} (x_{ij} - \bar{x}_i)^2$	SSE / $(N - k)$
Total	$N - 1$	$\sum_{i=1}^k \sum_{j=1}^{n_i} (x_{ij} - \bar{x})^2$	

$$F = \frac{\text{MST}}{\text{MSE}} \sim F_{k-1, N-k} \text{ under } H_0$$

ANOVA (3+ Sample Testing)

Relationship of ANOVA table entries

Source	df	SS	MS
Treatment	A	B	B / A
Error	C	D	D / C
Total	$A + C$	$B + D$	

Source	df	SS	MS
Treatment	A	B	B / A
Error	C	D	D / C
Total	$A + C$	$B + D$	

But Wait, There's More!

You can make presentations in \LaTeX too!
(like this one!)

But Wait, There's More (Again)!

\LaTeX Cheat Sheet

- <https://www.overleaf.com/11628447zbowtxvqbxbr#/43996246/>
 - (Lots of tips and tricks for writing \LaTeX documents)

\LaTeX Presentation Materials

- <https://www.overleaf.com/11628482ncxpqhdpbjnr#/43996388/>
 - (Coding for this presentation)
- <https://www.sharelatex.com/learn/Beamer>
 - (Beamer features, slide themes, color themes, etc.)