

L^AT_EX-Workshop



September 8, 2021

Introduction

Today, we will start our career in L^AT_EX. First, we will set up Overleaf. In Overleaf, you can work on L^AT_EX projects with multiple people at the same time. Therefore, EOR(AS) students use it for almost all group projects during their studies.

Start by going to overleaf.com. Create an account and open a 'Blank Project' via the 'New Project' button.

Now, we can really start using L^AT_EX. During this workshop, you can try to copy the given equations and exercises. Do not hesitate to ask for help to any of the teaching assistants or use Google to find the right commands. Good luck!

1 Writing in L^AT_EX

Writing in L^AT_EX is different than in Word. Instead of using enters, you will use the command `\` for a new sentence, and `\\` for a new paragraph. Furthermore, commands are used to write text **bold** or *italic* and change font sizes. To practice, try to rewrite the following exercises.

Exercise 1.1

Question: How many active members does VESTING have?

Answer: VESTING has approximately 100 active members.

Exercise 1.2

What is the most cost-efficient location for placing windmills in the Netherlands? If you enjoy solving a problem like this, Econometrics and Operations Research could be right for you.

The Bachelor's Econometrics and Operations Research (EOR) in Groningen teaches you all about econometric modelling. The strength of the programme lies in its combination of four profiles: Econometrics, Operations Research, Actuarial Science and Mathematical Economics.

Exercise 1.3

bold

italic

2 Basic commands

In this section, you will get familiar with some basic commands in L^AT_EX. To help you get started, we gave hints for all equations.

Equation 2.1

$$2x + 4y$$

Hint: use `$$` on the left hand side and right hand side of the equation.

Equation 2.2

$$2x \cdot 4y$$

Hint: use `\cdot`.

Equation 2.3

$$\sqrt{2x \cdot 4y}$$

Hint: use `\sqrt{}`.

Equation 2.4

$$\ln(2x + 4y)$$

Hint: use `\ln`.

Equation 2.5

$$\log(2x \cdot 4y)$$

Hint: use `\log`.

Equation 2.6

$$2x^{4y+8z}$$

Hint: use `^{}` .

Equation 2.7

$$\frac{2x + 4y}{8z}$$

Hint: use `\frac{}{}`.

Equation 2.8

$$x_{ij} = 2y_{ij} + 4z_{ij}$$

Hint: use `_`.

Equation 2.9

$$\sum_{i=1}^{\infty} x_i$$

Hint: use `\sum_{}^{}{}`.

Equation 2.10

$$\prod_{i=1}^{\infty} y_i$$

Hint: use `\prod_{}^{}{}`.

Equation 2.11

$$\int_0^{10} (2x + 4)dx$$

Hint: use `\int_{}^{}{}`.

Equation 2.12

$$\left[2x + 2y \left(\frac{1}{2} + x \right) \right]$$

Hint: use `\left` and `\right`.

3 Other characters and commands

In this section, you will get familiar with some other mathematical characters in \LaTeX . We do not give you any hints for the equations below. Don't hesitate to use Google when you are struggling. Using Google can be very helpful when using \LaTeX .

Equation 3.1

$$\alpha + \beta + \gamma + \epsilon + \delta + \pi + \theta$$

Equation 3.2

$$x \in A \iff x \notin B$$

Equation 3.3

$$l'(\theta) = \frac{\partial l}{\partial \theta}$$

Equation 3.4

$$\hat{x} + \bar{y} + \tilde{z}$$

Equation 3.5

$$x \leq y \Rightarrow y \neq z$$

Equation 3.6

$$\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix}$$

Hint: use the command `\usepackage{amsmath}` at the beginning of this document.

4 Combining commands

In this section, we will combine the commands learned above. This might all seem impressive, but after these two hours you will be able to complete this yourself.

Equation 4.1

$$\sum_{i=1}^{10} (2x_i^2 + 4y_i)^{x_i \cdot y_i}$$

Equation 4.2

$$\ln\left(\frac{\pi_i}{1 + \pi_i^2}\right)$$

Equation 4.3

$$\int_0^{10} x dx = \left[\frac{x^2}{2}\right]_0^{10}$$

Equation 4.4

$$\int_{x=0}^{x=1} \int_{y=1}^{y=2} (2x + y + 2e^{2y}) dy dx$$

Equation 4.5

$$\sum_{k=0}^{\infty} \frac{\lambda^k e^{-\lambda}}{k!} = 1$$

Equation 4.6

$$y = \frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sigma\sqrt{2\pi}}$$

Equation 4.7

$$\left(\begin{array}{cc} \frac{e_i^x}{3x_i \cdot \theta} & \int_2^{3x+1} (2x + 4xy + 3y^2) dy \\ \theta_i^2 + \prod_{i=0}^{10} \frac{\sqrt{2\alpha_i}}{(\alpha_i + \gamma_i)^{\theta_i}} & \sum_{i=0}^{10} \frac{\hat{\pi}_i}{\pi_i} \end{array} \right)$$

5 Attachments

In this section, we will learn the commands used to add attachments to your text.

Images



Figure 1: Logo Rijksuniversiteit Groningen

Hint: use `\usepackage{graphicx}` at the beginning of this document. Then upload a picture of the logo of the University of Groningen in the left bar. Then use `\begin{figure}`.

Tables

Course	Grade	Pass
Mathematics I	7	Yes
Microeconomics	8	Yes
Finance	6	Yes

Hint: get familiar with sites such as <https://www.tablesgenerator.com>.