Learning LaTeXfrom scratch

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1 Introduction to LaTeX

This is my first document. I'll be using latex for the rest of my life. I should not forget that the submission deadline for ICL Assignment 1 is on Saturday 6th, 2025 before 23.59 Kigali Time.

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2 Add graphics to my document

We can include images in our document.

Figure 1: Image of a cat.

3 Including two images side-by-side

Figure 2: First image of a cat.

Figure 3: Second image of a cat.

From figure 1 we can see a cute cat. The two figures 2 and 3 are displayed side-by-side.

If you want to type faster than me go to RataType.com

Go back to the section 1 (introduction).

4 Tables

If you want to insert a table in your LaTeXdocument, use the environment `\begin{table}\begin{tabular} ... \end{tabular}\end{table}`

```
greet (){
 echo "Hello, World!"
}
```

Table 1: Students' table

First name	**Surname**	**Country**
Lois	Kasongo	Zambia
Mustapha	Abdelhakim	Chad
Bonawewo	NULL	NULL

Table 2: Students' table (2)

First name	**Surname**	**Country**
Lois	Kasongo	Zambia
Mustapha	Abdelhakim	Chad
Bonawewo	NULL	NULL

From Table 1 and Table 2, blabla.

5 Math equations

5.1 Inline mathematics

5.1.1 This is a subsubsection ...

To solve the quadractic equation $ax^2 + bx + c = 0$, we calculate the discriminent $\Delta = b^2 - 4 \times a \times c$.

5.2 Outline mathematics

The variable X is from a normal distribution if its density is given by $f_X(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left\{-\frac{(x-\mu)^2}{2\sigma^2}\right\}, \quad x \in \mathbb{R}.$

$$f_X(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left\{-\frac{(x-\mu)^2}{2\sigma^2}\right\}, \quad x \in \mathbb{R}.$$

5.2.1 Numbered equations

The variable X is from a normal distribution if its density is given by

$$f_X(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left\{-\frac{(x-\mu)^2}{2\sigma^2}\right\}, \quad x \in \mathbb{R}. \tag{1}$$

From the equation (1), we can ...

5.2.2 Aligned and numbered equations

$$\begin{aligned} 2^x &= 8 && (2)\\ \implies x\log 2 &= \log 8 && (3)\\ \implies x &= \frac{\log 8}{\log 2} && (4) \end{aligned}$$

$$\begin{aligned} 2^x &= 8\\ \implies x\log 2 &= \log 8\\ \implies x &= \frac{\log 8}{\log 2} \end{aligned} \tag{5}$$

A variable $X \sim \mathcal{U}[a,b]$,

$$f_X(x) = \begin{cases} \dfrac{1}{b-a}, & \text{if } x \in [a,b] \text{ or } a \le x \le b\\ 0, & \text{otherwise.} \end{cases} \tag{6}$$

5.2.3 Matrices

$$\begin{matrix} 1 & 2 & 3\\ 4 & 5 & 6\\ 7 & 8 & 9 \end{matrix}$$

$$\begin{pmatrix} 1 & 2 & 3\\ 4 & 5 & 6\\ 7 & 8 & 9 \end{pmatrix}$$

$$\begin{bmatrix} 1 & 2 & 3\\ 4 & 5 & 6\\ 7 & 8 & 9 \end{bmatrix}$$

$$\begin{vmatrix} 1 & 2 & 3\\ 4 & 5 & 6\\ 7 & 8 & 9 \end{vmatrix}$$

$$\begin{Vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{Vmatrix}$$

To know about about climate and health analyses in Rwanda, check Iradukunda et al. (2025); Kenne et al. (2024).

6 Further reading

If you want to:

- Explore other classes (report, book, beamer)
- Make beamer presentions
- Enumerate in LaTeX
- Write algorithms
- Draw with TikZ
- Set counters
- Write a class
- Upload a project to Overleaf[1]
- Customized tables
- Compile R in LaTeX. Work with colors in LaTeX

[1] to https://overleaf.com

References

Iradukunda, P., Uwilingiyimana, C., and Rutikanga, J. U. (2025). Assessing the effects of climate change on agriculture productivity across rwanda's provinces and kigali city. *African Journal of Applied Statistics*, 11(1):1553–1576.

Kenne, A. D., Toure, M., Logamou Seknewna, L., and Ketsemen, H. L. (2024). Subseasonal prediction of summer temperature in west africa using artificial intelligence: A case study of senegal. *International Journal of Intelligent Systems*, 2024(1):8869267.