

Day 1, part 2. Text and Math

Digital Skills for Research

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1 Explore the interface of your desktop T_EX editor

- line numbers are useful for fixing errors
- use the toolbar to insert typical commands, if you prefer
- right-click on the name of the package to go to its documentation
- use use of auto-complete

2 Text formatting

2.1 Languages

International language support

```
\usepackage[T1, T2A]{fontenc}  
\usepackage[french, russian, main=english]{babel}
```

See specific packages names for individual languages [here](#).

For example, you need `\usepackage{arabtex}` and `\usepackage[LFE, LAE]{fontenc}` for Arabic.

T1 encoding for Latin script

T2A encoding for Cyrillic script

- You might want to install languages to your **local** T_EX distribution on Linux with `sudo apt install texlive-lang-polish` or install them all `sudo apt-get install -y texlive-lang-all`
- You might need to specifically import fonts for other languages.
- NB! main (or last one) in `\usepackage[french,russian,main=english]{babel}` is the language for automatic structural elements (e.g. Contents)
- In some templates short text snippets in non-main language are inserted with `\foreignlanguage{spanish}{...}`.

Examples in Spanish and Russian:

Sección Introductoria

Спасибо.

Sección Introductoria Спасибо.

2.2 Fonts and colours

font style roman (serif), bold, italics, typewriter, sans serif, small caps respectively in

`\textrm, \textbf, \textit, \texttt, \textsf, \textsc`

e.g. `ENCYCLOPEDIA GALACTICA`

`Don't Panic`

font size `\tiny, \scriptsize, \footnotesize, \small, \normalsize, \large, \Large, \LARGE, \huge,`

e.g. cf. `\huge{text formatting}` and `\tiny{text formatting}`:

text formatting

text formatting

underline Google strikethrough!

font colour `{\color{red!50!white}your_coloured_text}`

e.g. `my pink text`

2.3 Special characters

The following characters are reserved to have special meaning in L^AT_EX:

`$ % & ~ ^ { } _ \`

To print them literally you need to escape them with backslash (`\`), except

- for `\` itself use `$_backslash$`
- for `~` and `^` Use them inside `\verb|`

Formatting conventions:

- double quotes: tilde key (left uppermost key under Esc) without SHIFT and single quote twice → “ and ”
- `\lq` and `\rq` or tilde key + single quote → ‘ and ’ or ‘ and ’
- non-breaking space (SHIFT + tilde key): `Fig.\ref{fig:logo}`
- dots: `\ldots` → ...
- dash: `--` → –
- superscripts and subscripts: `2^2` and `CO_2` → 2^2 , CO_2
e.g. Proceedings of the 11th conference...

- accents: $\text{\^{\{a\}}}$, $\text{\'{\{o\}}}$, $\text{\v{\{c\}}}$, $\text{\"{\{e\}}}$, $\text{\~{\{o\}}}$ → â, ó, č, ë, ã
- language-specific ligatures: $\text{\ss{\}}$, $\text{\l{\}}$, $\text{\L{\}}$ → ß, l, L

Useful tool: [Detexify](#) (**CLICK ME! I am linked!**) symbol table and classifier

3 Math

3.1 Mathmode

- inline: $\text{\$your_formula\$}$
- on a separate line: \[your_formula\]
- special environment with a counter in label: $\text{\begin{equation}\label{eq:entropy} \dots \end{equation}}$

This formula $f(x) = 5x$ is incorporated in the body of text.

This is the same formula on a separate line:

$$f(x) = 5x$$

This is the same formula in the environment (notice the number on the right/left!). See equation 1. You can move the number to the left by adding leqno as an optional argument to the class definition $\text{\documentclass[a4paper,11pt,leqno]{article}}$

$$(1) \quad May5,2022 f(x) = 5x$$

3.2 Fractions

$$\text{\[\frac{1+\frac{4}{2}}{6} = 0,5\]}$$

$$\frac{1 + \frac{4}{2}}{6} = 0,5$$

3.3 Brackets

$$\text{\[\left(2+\frac{9}{3}\right) \times 5 = 25 \]}$$

$$\left(2 + \frac{9}{3}\right) \times 5 = 25$$

$$[2 + 3]$$

$$\text{\[\{2+3\} \]}$$

$$\{2 + 3\}$$

3.4 Standard functions

$$\text{\$\sin x = 0$, $\cos x = 1$, $\ln x = 5$} \sin x = 0, \cos x = 1, \ln x = 5$$

3.5 Symbols

$$\text{\$2\times 2 \neq 5$}$$

$$2 \times 2 \neq 5$$

$$A \cap B, A \cup B$$

3.6 Characters from other scripts

ϵ , ϕ

$\Phi = 1$

ϵ , ϕ

There are useful tools that reduce the sufferings:

1. [Online Equation Editor](#)
2. **Copy formatted formulas from html source code** (Inspect → Copy → Copy element):
[Second Law of Thermodynamics](#)

$$dS = \frac{\delta Q}{T} - \frac{1}{T} \sum_j \Xi_j \delta \xi_j$$

Task 2. Reproduce formatting in a file, inc. formulas

- Follow the instruction and reproduce text formatting in task1-2.pdf)