LaTeXworkshop (Exercises)

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1 New document

1. Start a LaTeXdocument with the text: *Hello world!*

2 Text

1. On the internet, find a short explanation of the definition of LaTeX (a sentence), and cite this sentence. Use a `\footnote{}` to make a reference to your source, and if necessary a `\url{}` (don't forget to include the 'url' package).

2. Look up (on the internet) how to make accents, such as coördinate, café (Dutch word), curaçaoënaar (Dutch word for inhabitant of Curaçao), etc. Also, look at the difference between 'text' and 'text' (pay attention to the accents).

3. Some characters, such as { are already defined within LaTeX. How do you think you can portray these characters in a text in the PDF? Hint: take a look at the standard form of the commands.

4. Try to produce the different list structures (enumerations, etc.) and all things explained in the manual yourself and try to, for example, make a new custom list structure.

3 Mathematical environment

1. Reproduce the following formulas, mind the braces!

   - $a_{1,1} + a_{1,2} + \ldots + a_{1,n} = \sum_{i=1}^{n} a_{1,i}$

   - $1 \in \left\{ x \mid \mathbb{R} \backslash 2^{3^4} \right\}$

   - $\lim_{n \to \infty} 2^{-n} = 0$

   - $\log_2(x \cdot y) \vee \log_4(x \cdot y)$

4   Do your own research

1. Try the different examples explained in the manual yourself.

2. Reproduce the following formulas:

   (a)
   $$\left\{(a,b) \in \mathbb{Z}^2 : b \neq 0\right\} \ni (0,1)$$

   (b)
   $$\overrightarrow{AB_\pm} = \langle a, \pm b \rangle \neq a\mathbf{i} \mp b\mathbf{j}$$

   (c) €42,- (you need a package for this)

   (d) Pay attention to the space between '∃' and 'η'! Hint: use `\stackrel{...}{...}` and `\mathcal`
   $$\exists\, \eta : \mathcal{A} \hookrightarrow \mathcal{B}, \zeta : \mathcal{B} \hookrightarrow \mathcal{A}$$
   $$\Updownarrow$$
   $$\exists\, \beta : \mathcal{A} \xrightarrow{\sim} \mathcal{B}$$

   (e) `\underbrace`
   $$\forall\, A, B \in V : \underbrace{\neg(A \wedge B)}_{\text{not } A \text{ and } B} \iff \underbrace{(\neg A) \vee (\neg B)}_{\text{not } A \text{ nor } B}$$

   (f)
   $$f : A \cup B \to \{0,1\} \text{ with } A \cap B = \emptyset \text{ defined by } x \mapsto \begin{cases} 0 & \text{if } x \in A \\ 1 & \text{if } x \in B \end{cases}$$

   (g)
   $$\binom{k}{n} = \prod_{l=1}^{n} \frac{k - l + 1}{l}$$

   (h)
   $$\Omega \setminus \left[\bigcup_{i \in I}\left(\bigcup_{j \in J} A_{i,j}\right)\right] \subseteq \left(\bigcap_{\substack{i \in I \\ j \in J}} A_{i,j}\right)^c$$

   (i)
   $$A = \begin{pmatrix} t & 0 & 0 & \dots & 0 & 0 \\ 0 & t & 0 & \dots & 0 & 0 \\ 0 & 0 & t & \dots & 0 & 0 \\ \vdots & \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & 0 & \dots & t & 0 \\ 0 & 0 & 0 & \dots & 0 & t \end{pmatrix}\Bigg|_{t=0}$$