

We have been using L^AT_EX macros to structure the document (e.g. `\documentclass`, `\section`, `\item`, `\[... \]`) and to control the typesetting (e.g. `\emph`, `\verb`, `\frac`).

One way to think about L^AT_EX and macros is as “semantic markup” for our writing: The text in the document body determines the meaning of what we write, the details of how it should be displayed is delegated to the definition of the macros and the typesetting engine. For example, when making a list with `\itemize`, we focus on writing the list and leave the job of picking numbers to

	1. bananas		<input type="checkbox"/> bananas
the <code>\item</code> macros:	2. papayas	or use squares instead:	<input type="checkbox"/> papayas
	3. iguanas		<input type="checkbox"/> iguanas

1. Define macros for different number systems: $\mathbb{R}, \mathbb{C}, \mathbb{N}$.
2. Define a macro to denote continuous functions \mathcal{C} .
3. Sometimes we want to specify the domain of the continuous functions we consider: $\mathcal{C}(\mathbb{R}^2)$, $\mathcal{C}([0, 1])$. Define a macro `\continuousOn` that takes the domain of continuity as argument.
4. We may write vectors in different ways: For example \mathbf{v} , \vec{v} , or \vec{v} . Define a macro `\vect` that takes one argument x and formats it as a vector \mathbf{x} .
5. Turn the argument into an optional argument so that `\cont[(\numR)]` displays $\mathcal{C}(\mathbb{R})$.
6. We can use the `xifthen` package and the `\ifthenelse` and `\equal` commands to change the behaviour of a macro based on whether an argument is provided or not. Modify `\cont` so that `\cont` displays \mathcal{C} and `\cont[\numR]` prints $\mathcal{C}(\mathbb{R})$.
7. Import the `xcolor` package and define a macro `\cmd` that prints its argument in blue type writer font, prefixed by a backslash. For example, `\cmd{cont}` displays `\cont`.
8. Define a macro `\demolength` that uses the `\rule` macro to demo the length that it receives as argument, e.g. `\demolength{1em}` yields \sqcup , and `\demolength{6pt}` gives \sqcup .
9. Use `\widthof` from the `calc` package to compare the lengths of different whitespace commands `\`, `\` , `~`, as in
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Which whitespace command should you use here? Why?