Preambles in LaTeX

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Contents

1 Setup

Here is how to get going with an article:

```
\documentclass{article}
\input{preambles/article}

\title{Your Title}
\author{Author}
\date{\today}

\begin{document}
\maketitle
...
\end{document}
```

2 Preambles

2.1 Articles and Presentations

Specify the type of document you are writing by choosing a preamble. For writing articles, use the `article` preamble at the top of your document:

```
\documentclass{article}
\input{preambles/article}
```

For writing presentations, use the `presentation` preamble at the top of your document:

```
\documentclass{beamer}
\input{preambles/presentation}
```

2.2 Default

The preambles for articles and presentations offer many kinds of features. Here are all the ones that are enabled by default! If you do not want to use the article or presentation preamble, you can use the `default` preamble at the top of your document:

```
\input{preambles/default}
```

2.2.1 Common Text Commands

	Usage	Example	Result
Italic Text	`\I{...}`	`\I{This is italic.}`	*This is italic.*
Bold Text	`\B{...}`	`\B{This is bold.}`	**This is bold.**
Underlined Text	`\U{...}`	`\U{This is underlined.}`	This is underlined.
Teletype (Monospace) Text	`\T{...}`	`\T{This is teletype.}`	`This is teletype.`
Striked Out Text	`\X{...}`	`\X{This is striked out.}`	~~This is striked out.~~

2.2.2 Special Sections

	Usage	Example	Result
Todo Marker	`\todo`	`\todo`	**TODO**
Comment	`\comment{...}`	`\comment{This is a comment.}`	**Comment: This is a comment.**

2.2.3 Colors

	Usage	Example	Result
Colors from `xcolor` package	`\color{...}`	`\color{blue} I'm blue... Da ba dee da ba daa...`	I'm blue... Da ba dee da ba daa...

2.2.4 Links and Email Addresses

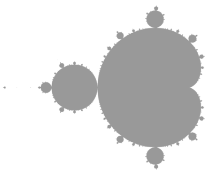
	Usage	Example	Result
Hyper References from `hyperref` package	`\href{...}{...}`	`\href{https://aekvi.com}{aekvi}`	aekvi
Emails	`\email{...}{...}`	`\email{abc@aekvi.com}{abc}`	abc

2.2.5 Citing and Bibliography

	Usage	Example	Result
Bibliography	`\bibliography{...}`	`\bibliography{refs}`	Renders bibliography assuming `refs.bib` file exists. See an example at the end of this document.
Cite	`\cite{...}`	`\cite{clausen}`	[1]

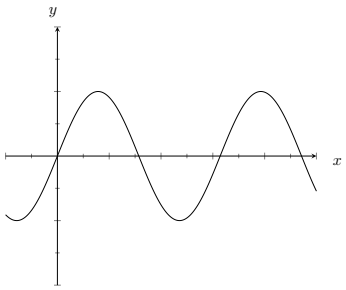
All citation features are from the `natbib` package. Learn more about it here.

2.2.6 Images

	Usage	Example	Result
Images	`\img[scale]{...}`	`\img[0.2]{assets/mandelbrot_set}`	 assuming assets/mandelbrot_set.png exists. `scale` is optional.

2.2.7 Plots

	Usage	Example	Result

Plots	`\plot[xmin]`
	`[xmax]`
	`[ymin]`
	`[ymax]{f}`
		`\plot[-2][10][-2][2]`
		`{sin(deg(x))}`
			
			`xmin, xmax, ymin, ymax` are optional.

2.2.8 TikZ

See OverLeafs tutorial on TikZ here. Using TikZ libraries `arrows`, `shapes` and `automata` by default.

2.2.9 Math

	Usage	Example	Result
`mathbb` symbols	`\Xb` for $X \in A \dots Z$	`\Ab,\Bb,\Cb,\Db`	$\mathbb{A}$, $\mathbb{B}$, $\mathbb{C}$, $\mathbb{D}$
`mathcal` symbols	`\Xc` for $X \in A \dots Z$	`\Ac,\Bc,\Cc,\Dc`	$\mathcal{A}$, $\mathcal{B}$, $\mathcal{C}$, $\mathcal{D}$
XOR	`$\xor$`	`$\xor$`	$\oplus$
Boolean Equality	`$\beq$`	`$a \beq b$`	$a \stackrel{?}{=} b$
(a nicely behaving) Modulo	`$\mod$`	`$a \mod b$`	$a \bmod b$
Q.E.D.	`\QED`	`\QED`	$\square$

2.3 Handin

The handin preamble contains useful features for writing handins. Use the `handin` preamble at the top of your document:

```
1 \input{preambles/handin}
```

2.3.1 Question and Remark Areas

Question areas are used to highlight exercise descriptions and solutions. You can define a question like so:

```
\question{Prove $P = NP$.}
```

This will render a question area like this:

Question: Prove $P = NP$.

A similar useful feature is adding a remark:

```
\remark{Proving $P = NP$ is pretty hard.}
```

This will render a remark area like this:

Remark: Proving $P = NP$ is pretty hard.

2.4 Code

The code preamble contains useful features for writing code. Use the `code` preamble at the top of your document:

```
\input{preambles/code}
```

2.4.1 Code Blocks

The `listings` package is used to render code blocks. One can define a code block like so:

```
\begin{lstlisting}[language=Haskell]
  main = putStrLn "Hello World!"
\end{lstlisting}
```

This will render a code block like this:

```
main = putStrLn "Hello World!"
```

Note that everything inside dollar symbols ($) is rendered as math. This means that you can use math symbols in your code blocks. For example, the following code block:

```
\begin{lstlisting}
Area($r$) = $\pi r ^ 2$
\end{lstlisting}
```

Will render like this:

```
Area(r) = πr²
```

2.5 Logic

The logic preamble contains useful features for writing LTL (Linear Temporal Logic) and CTL (Computation Tree Logic) amongst other things. Use the `logic` preamble at the top of your document:

```
\input{preambles/logic}
```

2.5.1 LTL and CTL

	Usage	Example	Result
Eventually	`\eventually`	`\eventually`	$\Diamond$
Always	`\always`	`\always`	$\Box$
Until	`\until`	`\until`	U
Weak Until	`\weakuntil`	`\weakuntil`	W
Release	`\release`	`\release`	R
Next	`\nex`	`\nex`	$\bigcirc$
True	`\true`	`\true`	true
False	`\false`	`\false`	false

2.5.2 Similarity and Bisimilarity

	Usage	Example	Result
Similarity	`\similar`	`\similar`	$\simeq$
Bisimilarity	`\bisimilar`	`\bisimilar`	$\sim$
Simulated By	`\simulatedby`	`\simulatedby`	$\preceq$

2.6 Protocols

The protocols preamble contains a useful macro for drawing protocols. Use the `protocols` preamble at the top of your document:

```
1 \input{preambles/protocols}
```

2.6.1 Protocol Diagrams

The `protocols` preamble contains a macro for drawing protocol diagrams. One can define a protocol diagram like so:

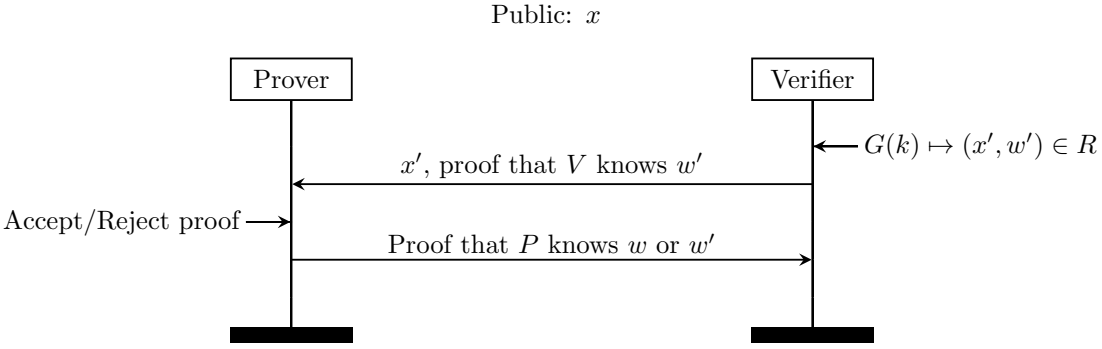
```
\protocol[$x$]{ZK from $\Sigma$-protocols}{
  \party{P}{Prover}
  \party{V}{Verifier}

  \knows{V}{$G(k) \mapsto (x', w') \in R$}{right}
  \msg{V}{$x'$, proof that $V$ knows $w'$}{P}

  \knows{P}{Accept/Reject proof}{left}
  \msg{P}{Proof that $P$\textit{knows}\w$ or $w'$}{V}
}
```

The result is a protocol diagram like this:

Protocol: **ZK from Σ-protocols**



2.6.2 Features

	Usage	Example	Result

Protocol	`\protocol`
	`  [public]`
	`  {name}`
	`  {body}`
	
	`public is`
	`optional.`
		`\protocol[public]{name}`
		`  {\party{P}{Prover}`
		`  \party{V}{Verifier}}`
			See following.

Party
(use in body)
	`\party`
	`  {symbol}`
	`  {name}`
		`\party{P}{Prover}`	See following.

Knows
(use in body)
	`\knows`
	`  {symbol}`
	`  {message}`
	`  {side}`
		`\knows{V}`
		`  {something private}`
		`  {left}`
			See following.

Message
(use in body)
	`\msg{from}`
	`  {message}`
	`  {to}`
		`\msg{V}{hello}{P}`	See following.

Condition
(use in body)
	`\cond`
	`  {message}`
	`  {parties}`
		`\cond{Wait for P.}{P,V}`	See following.

Protocol example:

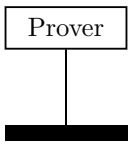
Protocol: **name**

Public: public

Party example:

Protocol: **name**

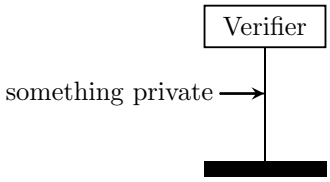
Public: public



Knows example:

Protocol: **name**

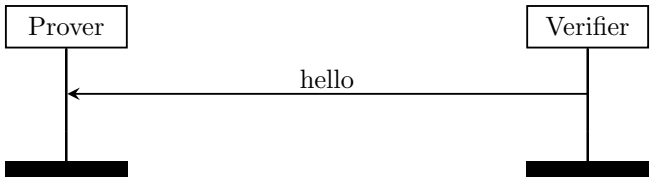
Public: public



Message example:

Protocol: **name**

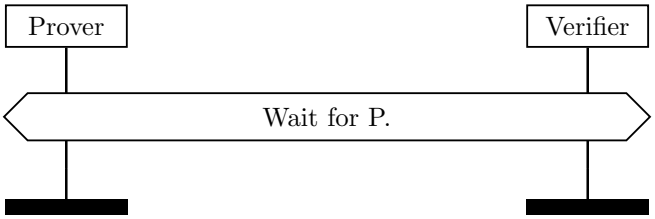
Public: public



Condition example:

Protocol: **name**

Public: public



References

[1] A. B. Clausen. *Preambles in LaTeX*, 2023.