

introduction <i>T_EX & METAFONT were developed by Dr. Donald E. Knuth and were Open Source since 1980. It is a typesetting application but an own programming language with over 300 commands as well. Everything is handled as a block. It supports multiple diacritics, dialects, etc. and was finished 1990 with version 3.14. Bugs haven't been found for a long time. It's OS & device independent and uses the .tex format, which is a DVI (Device-Independent) format. It has to be programmed for own use but there exist countless packages.</i>		structure environments <i>use common block syntax</i>		\end{titlepage}		newline \\ linebreak, no par \newline same \par linebreak, new par same	
		\begin{document} \end{document}		contenttables \tableofcontents section types \listoftables table envs \listoffigures figure envs		justification & space \centering centers block \raggedleft rights block \raggedright lefts block \begin{center}... new centered block	
		\begin{abstract} \end{abstract}		<i>content can be omitted from content tables by adding * to macro name</i> e.g. \section*{}		\ , 0.16667em space \ : default space ~ newline-safe def	
		\begin{quote} \end{quote}		<i>different name for tables and inside document can be provided</i> \section[table name]{document name}		\hspace{n} n horizontal space	
		{ } custom block		formatting		\smallskip small vert space \medskip .. \bigskip .. \vspace{n} n vertical space	
		Page style defines footer & header display \thispagestyle{empty} no header & footer \thispagestyle{plain} same but page number shown \thispagestyle{headings} same but maybe header (depending on class) \thispagestyle{myheadings} setup of own h & f		text style \textbf{text} bold \textit{text} <i>cursive</i> \texttt{text} typewriter \textsc{text} SMALL CAPITALS \textrm{text} roman font \textsf{text} serif font \textnormal{text} default of doc		\color{color!opacity} color of block \noindent removes indent on line \setlength{\parindent}{n} sets indent for whole document \rule{width}{thickness} horizontal line \noindent\makebox[\linewidth]{\rule{paperwidth}{0.4pt}} document spanning line \verb arg inline macro display \begin{verbatim} .. multiline macro display \end{verbatim}	
		Additional structure manipulation commands <i>exist. First 4 go into Preamble.</i>		text size <i>Need to be placed inside blocks/envs.</i> \Huge \huge \LARGE \Large \large \normalsize \small \footnotesize \tiny \scalebox{scale}{text}		misc	
essentials \documentclass[options]{styles} fleqn left align math leqno left align math num article no \part or \chapter IEEEtran (one) IEEE standard minimal min formatting slides presentation \usepackage[options]{package}		\renewcommand name of abstract {\abstractname}{name} \setcounter depth for section numbering {\secnumdepth}{n} \setcounter{tocdepth} depth of sections in table {n} \setcounter{page}{n} reset counter to n \pagemark prints pagenumber force add structure to \addcontentsline{toc} table. Place in doc defines place in table {subsection}{name}					
structure <i>Between documentclass and document is Preamble, documentwide commands come there.</i>		titlepage <i>Content to the title can be provided through:</i> \title{string} \date{date} \author{author \and author2 \thanks{text}} \maketitle <i>A custom titlepage can be generated as well, though everything needs to be done by hand then</i> \begin{titlepage} ...		special characters <i>Most special characters can be escaped.</i> \textbackslash \ \^ \$ \dq " \textbar \textless < \textgreater > \LaTeX L ^A T _E X \TeX T _E X		packages babel \usepackage[sub, main]{babel} inputenc Input enc (def=ascii, alt=utf8) fontenc Font enc (def=ot1, alt=t1) hyperref \url{add}, \href{add}{dname} geometry custom formatting scrlayer- \ihead{} \chead{} \ohead{} scrpage	
structure macros end at begin of new structure/end of document							
level	macro						
-1	\part{name}						
0	\chapter{name}						
1	\section{name}						
2	\subsection{name}						
3	\subsubsection{name}						
4	\paragraph{name}						
5	\subparagraph{name}						

lists	
<code>\begin{enumerate}</code>	
<code>\item entry 1</code>	1. entry 1
<code>\item entry 2</code>	2. entry 2
<code>\end{enumerate}</code>	

<code>\begin{itemize}</code>	
<code>\item entry 1</code>	• entry 1
<code>\item entry 2</code>	• entry 2
<code>\end{itemize}</code>	

<code>\begin{description}</code>	
<code>\item [name1] entry 1</code>	name1 entry 1
<code>\item [name2] entry 2</code>	name2 entry 2
<code>\end{description}</code>	

Can be used as horizontal list. Needs tasks and exsheets package.

<code>\begin{question}</code>	question
<code>\begin{tasks}(columns)</code>	<code>\task task 1</code>
<code>\task task 2</code>	<code>\end{tasks}</code>
<code>\end{question}</code>	

Übung 1.

task question?	
a) answer 1	b) answer 2

Lists of same type can be nested as well. They'll have different stylization.

<code>\begin{enumerate}</code>	<code>\item entry 1</code>
<code>\begin{itemize}</code>	<code>\item entry 1.1</code>
<code>\item entry 1.2</code>	<code>\end{itemize}</code>
<code>\end{enumerate}</code>	<code>\item entry 2</code>

1. entry 1	
• entry 1.1	
• entry 1.2	
2. entry 2	

floats

Floats are containers, that won't be broken over multiple pages.

<code>\begin{float}[placement]</code>
...
<code>\end{float}</code>

types	placement
table	h here
figure	t top
subfigure	b bottom
	p page
	! override default
	H precise here (float pkg)

<code>\caption[short]{title}</code>
<code>\label{name}</code>
<code>\ref{labelName}</code>

For better label naming, a "type:" can be added before the name.

type examples					
ch:	sec:	subsec:	fig:	tab:	eq:
lst:	itm:	alg:	app:		

graphics	
<code>\usepackage{graphicx}</code>	

Either provide a image folder and only import the name (on win: / instead of \):

<code>\graphicspath{path}</code>
<code>\includegraphics{name}</code>

or provide the path directly:			
<code>\includegraphics[options]{path}</code>			

options			
scale	width	height	angle
draft	keepaspectratio		

figure	
figure is an environment commonly used for images. It provides labels and captions.	

<code>\begin{figure}[placement]</code>
...
<code>\end{figure}</code>

More complex figures can be created with the subfigure environment. Needs the caption and subcaption package. Can be used to put multiple images in a row, etc.

<code>\begin{figure}</code>
<code>\begin{subfigure}</code>
...
<code>\end{subfigure}</code>
...
<code>\end{figure}</code>

tables
The <code>\table</code> float is not necessary but provides label & captions.

<code>\begin{table}[placement]</code>
<code>\begin{tabular}[position]{layout}</code>
content
<code>\end{tabular}</code>
<code>\end{table}</code>

Pos (mostly useless)	
b	bottom
c	center
t	top

Layout	
l	left justified
c	center justified
r	right justified
p{n}	n wide line breakable cell. Align with top of row
m{n}	same. Align with center
b{n}	same. Align with bottom
	vertical line
	double line

content layout	
&	col seperator
\\	new row
<code>\hline</code>	horizontal line
<code>\newline</code>	new line within cell
<code>\cline{i-j}</code>	line begin col i & end col j
<code>\multicolumn{n}</code>	
{n}	content across n columns in row
{layout}	
{content}	

mathematics

	justify formulas to that
&	pos
<code>\nonumber</code>	line not counted as eq
<code>\begin{split}</code>	use in singleline env for
<code>\end{split}</code>	multiline

numbering can be omitted with an * added, like `\begin{align*}`. Labels in multiline envs need to added to every wanted line for referencing.

environments			
env	d/t	sl/ml	num
<code>\$. . \$</code>	t	sl	n
<code>\$\$. . \$\$</code>	d	sl	n
<code>\(. . \)</code>	t	sl	n
<code>\[. . \]</code>	d	sl	n
<code>\begin{math} . .</code>			
<code>\end{math}</code>	t	sl	n
<code>\begin{displaymath} . .</code>			
<code>\end{displaymath}</code>	d	sl	n
<code>\begin{equation} . .</code>			
<code>\end{equation}</code>	d	sl	y

amsmath envs are all d, ml and num.

<code>\begin{multiline} . .</code>	only for single eqs
<code>\end{multiline}</code>	too long for 1 line
<code>\begin{gather} . .</code>	newlines like tab,
<code>\end{gather}</code>	no align
<code>\begin{align} . .</code>	newlines like tab,
<code>\end{align}</code>	align

functions			
$\wedge \{x\}$	1^x	$_ \{x\}$	1_x
<code>\sqrt{x}{y}</code>	$\sqrt[y]{y}$	$(x+y)$	$(x+y)$
<code>\frac{x}{y}</code>	$\frac{x}{y}$	$\{x+y\}$	$\{x+y\}$
<code>\binom{x}{y}</code>	$\binom{x}{y}$	$[x+y]$	$[x+y]$

<code>overbrace{x}</code>	\overbrace{x}
<code>underbrace{x}</code>	\underbrace{x}

<code>\leftTYPE</code>	..
<code>\rightTYPE</code>	$\rangle 40 \langle \langle 40 \rangle \mid 40 \mid$

<code>\cfrac{x}{y}</code>	$\frac{x}{x + \frac{x}{y + n}}$
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Both need an env. Almost identical.

<code>\begin{array}</code>	
{layout} . .	<code>\begin{matrix}</code>
<code>\end{array}</code>	<code>\end{matrix}</code>

z	=	a
	=	a

$f(x,y,z) = x+y+z$
with amsmath a t or d can be added to some functions for better textmode / displaymode display (e.g. `\dfrac`).