

Special Characters

Certain characters in $\text{\TeX}$ have special functions:

$\backslash$ introduces a control sequence.

$\{$ and $\}$ limit the scope of a command and group commands.

$\$$ introduces and terminates math mode.

$\$\$$ introduces and terminates display math mode.

$\%$ introduces a comment. All text on a line following $\%$ is ignored.

$\&$ alignment character. Used in tables to indicate column separation.

$\#$ denotes an item in a $\backslash\text{halign}$ table or an argument in a macro.

$_$ used to indicate that the character immediately following is a subscript.

$\^$ used to indicate that the character immediately following is a superscript.

$\sim$ denotes an unbreakable space. Words with a tilde between them will not be printed on separate lines in the output.

If you want these characters to appear in the output you must enter them as follows:

$\backslash$	is entered as	$\backslash\text{backslash}\$$
$\{$	" "	$\backslash\{ \$$
$\}$	" "	$\backslash\} \$$
$\$$	" "	$\backslash \$$
$\%$	" "	$\backslash\%$
$\&$	" "	$\backslash\&$
$\#$	" "	$\backslash\#$
$_$	" "	$\backslash_$
$\^$	" "	$\backslash\^{\{}$
$\sim$	" "	$\backslash\sim\}$

Keywords

at is a keyword within font commands e.g. $\backslash\text{font}\backslash\text{bigrm}=\text{cmr10 at 12pt}$

by is an optional keyword in combination with $\backslash\text{advance} \dots \text{by} \dots$, $\backslash\text{multiply} \dots \text{by} \dots$, $\backslash\text{divide} \dots \text{by} \dots$

depth keyword for the $\backslash\text{vrule}$ and $\backslash\text{hrule}$ commands for the depth (below the baseline) of a rule.

Example

$\backslash\text{vrule height 5cm depth 2cm width 0.4pt}$

<code>fil</code>	internal measuring unit for dynamic space of first order <code>\hskip 0pt plus 1fil</code> is equivalent to <code>\hfil</code> . Note: <code>fil << fill << filll</code>
<code>height</code>	is an optional keyword for the <code>\hrule</code> , <code>\vrule</code> commands to determine the height of a rule. Example: <code>\vrule height 4cm width 0.4pt</code>
<code>minus</code>	is a keyword for dimensions of <code>\skip</code> commands. It represents the skip part that can shrink. In <code>\hskip 3cm minus 1cm</code> the skip may shrink to 2 cm if there is not enough space.
<code>mu</code>	unit of measure: mathematical unit only for mathematical mode $18\mu = 1\text{em}$
<code>plus</code>	is a keyword that is used when specifying skip values. This determines how much the skip may be enlarged to fit the size of an outer box. Example: <code>\vskip 1cm plus 0.5cm minus 0.5cm</code>
<code>scaled</code>	is a keyword used in combination with the <code>\font</code> command. It specifies the scaling value. The value is given as an integer, to obtain the desired factor it has to be divided by 1000. It is normally used in combination with <code>\magstep</code> . Example: <code>\font\bigbf=cmbx10 scaled \magstep2</code>
<code>spread</code>	is a keyword for a box creating command like <code>\hbox</code> , <code>\vbox</code> , <code>\valign</code> . It determines how much the created box is treated larger than it's natural size. The natural size is accumulated by the contents of the box. Example: <code>\hbox spread 1cm{\hfill abc\hfill}</code> produces a box that is 1cm wider than a <code>\hbox{abc}</code> . The text 'abc' will be surrounded at left and right side by 0.5cm space. The box should contain dynamic space to fill the spread part.
<code>to</code>	is a keyword in <code>\hbox</code> , <code>\vbox</code> , <code>\vtop</code> . . . commands. Example <code>\hbox to 3cm{. . .}</code>
<code>true</code>	is a keyword that may be used in combination with units of measure. It precedes the unit that will not be scaled by the global value given by <code>\magnification</code> . Example: <code>\vskip 10 truecm</code> for a picture with fixed size.

width is an optional keyword in combination with `\hrule` and `\vrule`

Example: `\hrule width 10cm`

The remaining keywords are

Dimensions

Units		Conversions	
pt	point*	1pt	≈ 0.0351cm
pc	pica*	1pc = 12pt	1pc ≈ 0.422cm
in	inch	1in = 72.27pt	1in = 2.54cm
bp	big point†	72bp = 1in	1bp ≈ 0.0353cm
cm	centimetre		1cm ≈ 28.54pt
mm	millimetre		1mm = 0.1cm
dd	didôt point‡	1157dd = 1238pt	1dd ≈ 0.0376cm
cc	cicero‡	1cc = 12dd	1cc ≈ 0.451cm
sp	scaled point	65536sp = 1pt	1sp < 0.6 * 10 ⁻⁶ cm

* Anglo-American pica-(point-)system.

† PostScript point, point size used in most desktop publishing programs.

‡ French point system, used on the continent.

T_EX internally converts all measuring units to scaled points. The largest possible value is about 5.7583 metres. The following two dimensions are dependent on the font currently in use:

em is a horizontal measure usually equal to the point size of the font and about the width of the letter ‘M’ in the font.

ex is the height of a non-ascending lower case letter, about the height of an ‘x’.

Catcodes

The primitive command `\catcode` defines the interpretation of every character that **T_EX** reads. There are 16 category codes that determine all character functions.

- 0 `\catcode'\=0` escape symbol
- 1 `\catcode'\{=1` left brace – begin group
- 2 `\catcode'\}=2` right brace – end group
- 3 `\catcode'\$=3` math. shift
- 4 `\catcode'\&=4` alignment tab
- 5 `\catcode'\^M=5` end of input line
- 6 `\catcode'\#=6` macro parameter character
- 7 `\catcode'\^=7` math. superscript

8 `\catcode'\_ =8` math. subscript
 9 `\catcode'\^@=9` a character to be ignored
 10 `\catcode'\ =10` space
 11 are letters (A . . . Z, a . . . z)
 12 are other characters
 13 are active characters (e.g., ~ tilde)
 14 `\catcode'\% =14` start of comment
 15 are invalid characters (e.g., \^?)

Example: `plain.tex` redefines '@' to be a letter symbol by
`\catcode'\@=11` before using it within private macros. After-
 wards it is reset to its normal value: `\catcode'\@=12`

The quote mark in the catcode examples is actually the
 ASCII grave, although in the typewriter font it looks like a left
 typographic quote mark.

Most of the information in this document has been copied from
 Einführung in T_EX/Introduction to T_EX (Schwarz, Krieger).