

9. Control sequences. The tables we have seen show all of the special symbols that appear in  $\text{\TeX}$ 's standard fonts. But the question remains, how can a person specify them on an ordinary keyboard? Well, you can always define your favorite control sequence in terms of the  $\backslash\text{char}$  operation; and if you have a suitable keyboard you can type the symbols of SUAI code directly.  $\text{\TeX}$  also recognizes the control sequences listed below, when in math mode.

(a) Lower case Greek letters:

$\alpha$	$\backslash\alpha$	$\kappa$	$\backslash\kappa$	$\upsilon$	$\backslash\upsilon$
$\beta$	$\backslash\beta$	$\lambda$	$\backslash\lambda$	$\phi$	$\backslash\phi$
$\gamma$	$\backslash\gamma$	$\mu$	$\backslash\mu$	$\chi$	$\backslash\chi$
$\delta$	$\backslash\delta$	$\nu$	$\backslash\nu$	$\psi$	$\backslash\psi$
$\epsilon$	$\backslash\epsilon$	$\xi$	$\backslash\xi$	$\omega$	$\backslash\omega$
$\zeta$	$\backslash\zeta$	$\pi$	$\backslash\pi$	$\varphi$	$\backslash\varphi$
$\eta$	$\backslash\eta$	$\rho$	$\backslash\rho$	$\vartheta$	$\backslash\vartheta$
$\theta$	$\backslash\theta$	$\sigma$	$\backslash\sigma$	$\varpi$	$\backslash\varpi$
$\iota$	$\backslash\iota$	$\tau$	$\backslash\tau$		

(b) Upper case Greek letters:

$\Gamma$	$\backslash\Gamma$	$\Sigma$	$\backslash\Sigma$	$\Gamma$	$\backslash\Gamma\text{it}$	$\Sigma$	$\backslash\Sigma\text{it}$
$\Delta$	$\backslash\Delta$	$\Upsilon$	$\backslash\Upsilon$	$\Delta$	$\backslash\Delta\text{it}$	$\Upsilon$	$\backslash\Upsilon\text{it}$
$\Theta$	$\backslash\Theta$	$\Phi$	$\backslash\Phi$	$\Theta$	$\backslash\Theta\text{it}$	$\Phi$	$\backslash\Phi\text{it}$
$\Lambda$	$\backslash\Lambda$	$\Psi$	$\backslash\Psi$	$\Lambda$	$\backslash\Lambda\text{it}$	$\Psi$	$\backslash\Psi\text{it}$
$\Xi$	$\backslash\Xi$	$\Omega$	$\backslash\Omega$	$\Xi$	$\backslash\Xi\text{it}$	$\Omega$	$\backslash\Omega\text{it}$
$\Pi$	$\backslash\Pi$			$\Pi$	$\backslash\Pi\text{it}$		

(c) Script letters:

$\mathcal{A}$	$\backslash\mathcal{A}$	$\mathcal{J}$	$\backslash\mathcal{J}$	$\mathcal{S}$	$\backslash\mathcal{S}$
$\mathcal{B}$	$\backslash\mathcal{B}$	$\mathcal{K}$	$\backslash\mathcal{K}$	$\mathcal{T}$	$\backslash\mathcal{T}$
$\mathcal{C}$	$\backslash\mathcal{C}$	$\mathcal{L}$	$\backslash\mathcal{L}$	$\mathcal{U}$	$\backslash\mathcal{U}$
$\mathcal{D}$	$\backslash\mathcal{D}$	$\mathcal{M}$	$\backslash\mathcal{M}$	$\mathcal{V}$	$\backslash\mathcal{V}$
$\mathcal{E}$	$\backslash\mathcal{E}$	$\mathcal{N}$	$\backslash\mathcal{N}$	$\mathcal{W}$	$\backslash\mathcal{W}$
$\mathcal{F}$	$\backslash\mathcal{F}$	$\mathcal{O}$	$\backslash\mathcal{O}$	$\mathcal{X}$	$\backslash\mathcal{X}$
$\mathcal{G}$	$\backslash\mathcal{G}$	$\mathcal{P}$	$\backslash\mathcal{P}$	$\mathcal{Y}$	$\backslash\mathcal{Y}$
$\mathcal{H}$	$\backslash\mathcal{H}$	$\mathcal{Q}$	$\backslash\mathcal{Q}$	$\mathcal{Z}$	$\backslash\mathcal{Z}$
$\mathcal{I}$	$\backslash\mathcal{I}$	$\mathcal{R}$	$\backslash\mathcal{R}$	$\mathcal{l}$	$\backslash\mathcal{l}$

*(d) Binary operators:*

$\pm$	<code>\pm</code>	$\oplus$	<code>\oplus</code>	$*$	<code>\ast</code>
$\mp$	<code>\mp</code>	$\ominus$	<code>\ominus</code>	$\circ$	<code>\circ</code>
$\times$	<code>\times</code>	$\otimes$	<code>\otimes</code>	$\bullet$	<code>\bullet</code>
$\div$	<code>\div</code>	$\oslash$	<code>\oslash</code>	$\intercal$	<code>\intercal</code>
$\backslash$	<code>\backslash</code>	$\odot$	<code>\odot</code>	$\sqcup$	<code>\sqcup</code>
$\cdot$	<code>\cdot</code>	$\uplus$	<code>\uplus</code>	$\sqcap$	<code>\sqcap</code>

*(e) Binary relations:*

$\uparrow$	<code>\up</code>	$\perp$	<code>\perp</code>	$\prec$	<code>\prec</code>
$\downarrow$	<code>\down</code>	$\vdash$	<code>\vdash</code>	$\preceq$	<code>\preceq</code>
$\Leftarrow$	<code>\leftarrow</code>	$\dashv$	<code>\dashv</code>	$\succ$	<code>\succ</code>
$\Rightarrow$	<code>\rightarrow</code>	$\mapsto$	<code>\mapsto</code>	$\succeq$	<code>\succeq</code>
$\Uparrow$	<code>\Uparrow</code>	$\relv$	<code>\relv</code>	$\sqsubset$	<code>\sqsubset</code>
$\Downarrow$	<code>\Downarrow</code>	$\relvv$	<code>\relvv</code>	$\lsl$	<code>\lsl</code>
$\Leftrightarrow$	<code>\Leftrightarrow</code>	$\subset$	<code>\subset</code>	$\grg$	<code>\grg</code>
$\lsh$	<code>\lsh</code>	$\supset$	<code>\supset</code>	$\simeq$	<code>\simeq</code>
$\rsh$	<code>\rsh</code>	$\in$	<code>\in</code>	$\approx$	<code>\approx</code>
		$\notin$	<code>\notin</code>	$\doteq$	<code>\doteq</code>

You can also use the control sequence `\not` to negate or “cross out” most of the relations above. For example, the symbol “ $\not\subset$ ” is really two symbols, obtained by typing “`\not\subset`”. (Character ‘100 in the symbol font has a width of zero, so it will overlap the following character.) But watch out: you should actually type “`\mathrel{\not\subset}`”, in order to prevent TeX from breaking a line after `\not`. (See the definition of `\neq` in Appendix B.)

*(f) Brackets:*

$\lfloor$	<code>\lfloor</code>	$\rfloor$	<code>\rfloor</code>
$\lceil$	<code>\lceil</code>	$\rceil$	<code>\rceil</code>
$\{$	<code>\{</code>	$\}$	<code>\}</code>
$\langle$	<code>\langle</code>	$\rangle$	<code>\rangle</code>
$\llbracket$	<code>\llbracket</code>	$\rrbracket$	<code>\rrbracket</code>
$\left $	<code>\left </code>	$\right $	<code>\right </code>
$\ $	<code>\ </code>	$\ $	<code>\ </code>

(g) “Large” operators (text and display styles):

$\Sigma$	$\sum$	<code>\sum</code>	$\cap$	$\bigcap$	<code>\inter</code>	$\prod$	$\prod$	<code>\prod</code>
$\oplus$	$\bigoplus$	<code>\osum</code>	$\cup$	$\bigcup$	<code>\union</code>	$\otimes$	$\bigotimes$	<code>\oproduct</code>
$\int$	$\int$	<code>\int</code>	$\sqcup$	$\sqcup$	<code>\squnion</code>	$\odot$	$\bigodot$	<code>\odotprod</code>
$\oint$	$\oint$	<code>\oint</code>	$\wedge$	$\bigwedge$	<code>\meet</code>	$\uplus$	$\biguplus$	<code>\munion</code>
			$\vee$	$\bigvee$	<code>\join</code>			

(h) Miscellaneous math symbols:

$\imath$	<code>\iit</code>	$\infty$	<code>\infty</code>	$\partial$	<code>\partial</code>
$\jmath$	<code>\jit</code>	$\emptyset$	<code>\emptyset</code>	$\nabla$	<code>\nabla</code>
$\Re$	<code>\real</code>	$\#$	<code>\#</code>	$\int$	<code>\smallint</code>
$\Im$	<code>\imag</code>	$\parallel$	<code>\parallel</code>	$\surd$	<code>\surd</code>
$\aleph$	<code>\aleph</code>	$\angle$	<code>\angle</code>	$\top$	<code>\top</code>
$\wp$	<code>\wp</code>	$\prime$	<code>\prime</code>	$\bot$	<code>\bot</code>

(i) Miscellaneous nonmath symbols (but allowed only in math mode):

$\S$	<code>\section</code>	$\textcircled{\circ}$	<code>\textcircled{\circ}</code>
$\dagger$	<code>\dag</code>	$\textcircled{c}$	<code>\copyright</code>
$\ddagger$	<code>\ddag</code>	$\textsterling$	<code>\sterling</code>
$\P$	<code>\P</code>	$\textdollar$	<code>\\$</code>

Some of the symbols in TeX’s math fonts can be accessed directly only by using the SUAI-oriented conversions in subsection 8. For example, the only way to get a left arrow is by typing “ $\$+\$$ ”; no built-in control sequence has been defined for it. If your keyboard doesn’t have this symbol, the remedy is to define an appropriate new control sequence, such as

```
\def\from{\mathrel{\char"440}}
```