Introduction to LaTeX

Appendix

Liu Yihao

SJTU-UMJI Technology Department

June 22, 2021

1. Appendix
   - Symbol table
   - Package List
   - Reference

Symbol tables from lshort

Liu Yihao

The following tables demonstrate all the symbols normally accessible from math mode. Note that some tables show symbols only accessible after loading the amssymb package in the preamble of your document[1]. If the $\mathcal{AMS}$ package and fonts are not installed on your system, have a look at CTAN:pkg/amslatex. An even more comprehensive list of symbols can be found at CTAN:info/symbols/comprehensive.

Table 1: Math Mode Accents.

$\hat{a}$	`\hat{a}`	$\check{a}$	`\check{a}`	$\tilde{a}$	`\tilde{a}`
$\grave{a}$	`\grave{a}`	$\dot{a}$	`\dot{a}`	$\ddot{a}$	`\ddot{a}`
$\bar{a}$	`\bar{a}`	$\vec{a}$	`\vec{a}`	$\widehat{AAA}$	`\widehat{AAA}`
$\acute{a}$	`\acute{a}`	$\breve{a}$	`\breve{a}`	$\widetilde{AAA}$	`\widetilde{AAA}`
$\mathring{a}$	`\mathring{a}`				

[1] The tables were derived from `symbols.tex` by David Carlisle and subsequently changed extensively as suggested by Josef Tkadlec.

Table 2: Greek Letters.

There is no uppercase of some of the letters like \Alpha, \Beta and so on, because they look the same as normal roman letters: A, B...

α	\alpha	θ	\theta	o	o	υ	\upsilon
β	\beta	ϑ	\vartheta	π	\pi	ϕ	\phi
γ	\gamma	ι	\iota	ϖ	\varpi	φ	\varphi
δ	\delta	κ	\kappa	ρ	\rho	χ	\chi
ϵ	\epsilon	λ	\lambda	ϱ	\varrho	ψ	\psi
ε	\varepsilon	μ	\mu	σ	\sigma	ω	\omega
ζ	\zeta	ν	\nu	ς	\varsigma		
η	\eta	ξ	\xi	τ	\tau		
Γ	\Gamma	Λ	\Lambda	Σ	\Sigma	Ψ	\Psi
Δ	\Delta	Ξ	\Xi	Υ	\Upsilon	Ω	\Omega
Θ	\Theta	Π	\Pi	Φ	\Phi		

Table 3: Binary Relations.

You can negate the following symbols by prefixing them with a \not command.

$<$	<	$>$	>	$=$	=
$\leq$	\leq or \le	$\geq$	\geq or \ge	$\equiv$	\equiv
$\ll$	\ll	$\gg$	\gg	$\doteq$	\doteq
$\prec$	\prec	$\succ$	\succ	$\sim$	\sim
$\preceq$	\preceq	$\succeq$	\succeq	$\simeq$	\simeq
$\subset$	\subset	$\supset$	\supset	$\approx$	\approx
$\subseteq$	\subseteq	$\supseteq$	\supseteq	$\cong$	\cong
$\sqsubset$	\sqsubset [a]	$\sqsupset$	\sqsupset [a]	$\bowtie$	\Join [a]
$\sqsubseteq$	\sqsubseteq	$\sqsupseteq$	\sqsupseteq	$\bowtie$	\bowtie
$\in$	\in	$\ni$	\ni , \owns	$\propto$	\propto
$\vdash$	\vdash	$\dashv$	\dashv	$\models$	\models
$\mid$	\mid	$\parallel$	\parallel	$\perp$	\perp
$\smile$	\smile	$\frown$	\frown	$\asymp$	\asymp
:	:	$\notin$	\notin	$\neq$	\neq or \ne

[a] Use the latexsym package to access this symbol

Table 4: Binary Operators.

$+$	+	$-$	-		
$\pm$	\pm	$\mp$	\mp	$\triangleleft$	\triangleleft
$\cdot$	\cdot	$\nabla\cdot$	\div	$\triangleright$	\triangleright
$\times$	\times	$\setminus$	\setminus	$\star$	\star
$\cup$	\cup	$\cap$	\cap	$*$	\ast
$\sqcup$	\sqcup	$\sqcap$	\sqcap	$\circ$	\circ
$\vee$	\vee , \lor	$\wedge$	\wedge , \land	$\bullet$	\bullet
$\oplus$	\oplus	$\ominus$	\ominus	$\diamond$	\diamond
$\odot$	\odot	$\oslash$	\oslash	$\uplus$	\uplus
$\otimes$	\otimes	$\bigcirc$	\bigcirc	$\amalg$	\amalg
$\bigtriangleup$	\bigtriangleup	$\bigtriangledown$	\bigtriangledown	$\dagger$	\dagger
$\lhd$	\lhd ^{a}	$\rhd$	\rhd ^{a}	$\ddagger$	\ddagger
$\unlhd$	\unlhd ^{a}	$\unrhd$	\unrhd ^{a}	$\wr$	\wr

Table 5: BIG Operators.

$\sum$	\sum	$\bigcup$	\bigcup	$\bigvee$	\bigvee
$\prod$	\prod	$\bigcap$	\bigcap	$\bigwedge$	\bigwedge
$\coprod$	\coprod	$\bigsqcup$	\bigsqcup	$\biguplus$	\biguplus
$\int$	\int	$\oint$	\oint	$\bigodot$	\bigodot
$\bigoplus$	\bigoplus	$\bigotimes$	\bigotimes		

Table 6: Arrows as Accents.

$\overrightarrow{AB}$	\overrightarrow{AB}	$\underrightarrow{AB}$	\underrightarrow{AB}
$\overleftarrow{AB}$	\overleftarrow{AB}	$\underleftarrow{AB}$	\underleftarrow{AB}
$\overleftrightarrow{AB}$	\overleftrightarrow{AB}	$\underleftrightarrow{AB}$	\underleftrightarrow{AB}

Table 7: Arrows.

$\leftarrow$	\leftarrow or \gets	$\longleftarrow$	\longleftarrow
$\rightarrow$	\rightarrow or \to	$\longrightarrow$	\longrightarrow
$\leftrightarrow$	\leftrightarrow	$\longleftrightarrow$	\longleftrightarrow
$\Leftarrow$	\Leftarrow	$\Longleftarrow$	\Longleftarrow
$\Rightarrow$	\Rightarrow	$\Longrightarrow$	\Longrightarrow
$\Leftrightarrow$	\Leftrightarrow	$\Longleftrightarrow$	\Longleftrightarrow
$\mapsto$	\mapsto	$\longmapsto$	\longmapsto
$\hookleftarrow$	\hookleftarrow	$\hookrightarrow$	\hookrightarrow
$\leftharpoonup$	\leftharpoonup	$\rightharpoonup$	\rightharpoonup
$\leftharpoondown$	\leftharpoondown	$\rightharpoondown$	\rightharpoondown
$\rightleftharpoons$	\rightleftharpoons	$\iff$	\iff (bigger spaces)
$\uparrow$	\uparrow	$\downarrow$	\downarrow
$\updownarrow$	\updownarrow	$\Uparrow$	\Uparrow
$\Downarrow$	\Downarrow	$\Updownarrow$	\Updownarrow
$\nearrow$	\nearrow	$\searrow$	\searrow
$\swarrow$	\swarrow	$\nwarrow$	\nwarrow
$\rightsquigarrow$	\leadsto [a]		

[a] Use the latexsym package to access this symbol

Table 8: Delimiters.

(	(	)	)	↑	\uparrow
[	[or \lbrack	]	] or \rbrack	↓	\downarrow
{	\{ or \lbrace	}	\} or \rbrace	↕	\updownarrow
⟨	\langle	⟩	\rangle	⇑	\Uparrow
∣	| or \vert	∥	\\| or \Vert	⇓	\Downarrow
/	/	\	\backslash	⇕	\Updownarrow
⌊	\lfloor	⌋	\rfloor		
⌉	\rceil	⌈	\lceil		

Table 9: Large Delimiters.

⎧	\lgroup	⎫	\rgroup	⎰	\lmoustache
⎪	\arrowvert	⎪	\Arrowvert	⎪	\bracevert
⎩	\rmoustache				

Table 10: Miscellaneous Symbols.

$\ldots$	\dots	$\cdots$	\cdots	$\vdots$	\vdots	$\ddots$	\ddots
$\hbar$	\hbar	$\imath$	\imath	$\jmath$	\jmath	ℓ	\ell
$\Re$	\Re	$\Im$	\Im	$\aleph$	\aleph	$\wp$	\wp
$\forall$	\forall	$\exists$	\exists	$\mho$ [a]	\mho [a]	∂	\partial
$'$	'	$\prime$	\prime	$\emptyset$	\emptyset	∞	\infty
∇	\nabla	$\triangle$	\triangle	$\Box$ [a]	\Box [a]	$\Diamond$ [a]	\Diamond [a]
$\bot$	\bot	$\top$	\top	$\angle$	\angle	$\surd$	\surd
$\diamondsuit$	\diamondsuit	$\heartsuit$	\heartsuit	$\clubsuit$	\clubsuit	$\spadesuit$	\spadesuit
$\neg$	\neg or \lnot	$\flat$	\flat	$\natural$	\natural	$\sharp$	\sharp

[a] Use the latexsym package to access this symbol

Table 11: Non-Mathematical Symbols.

These symbols can also be used in text mode.

†	\dag	§	\S	©	\copyright	®	\textregistered
‡	\ddag	¶	\P	£	\pounds	%	\%

Table 12: $\mathcal{AMS}$ Delimiters.

⌜	\ulcorner	⌝	\urcorner	⌞	\llcorner	⌟	\lrcorner
|	\lvert	|	\rvert	‖	\lVert	‖	\rVert

Table 13: $\mathcal{AMS}$ Greek and Hebrew.

$\digamma$	\digamma	$\varkappa$	\varkappa	ℶ	\beth	ℷ	\gimel	ℸ	\daleth

Table 14: Math Alphabets.

Example	Command	Required package
ABCDEabcde1234	`\mathrm{ABCDE abcde 1234}`	
$ABCDEabcde1234$	`\mathit{ABCDE abcde 1234}`	
$ABCDEabcde1234$	`\mathnormal{ABCDE abcde 1234}`	
$\mathcal{ABCDE}\dashv\lfloor\rfloor\lceil\rceil\infty\in\ni\triangle$	`\mathcal{ABCDE abcde 1234}`	
$\mathscr{ABCDE}$	`\mathscr{ABCDE abcde 1234}`	mathrsfs
$\mathfrak{ABCDEabcde1234}$	`\mathfrak{ABCDE abcde 1234}`	amsfonts or amssymb
$\mathbb{ABCDE}\nexists\neq\neq\nexists$	`\mathbb{ABCDE abcde 1234}`	amsfonts or amssymb

Table 15: $\mathcal{AMS}$ Binary Operators.

$\dotplus$	\dotplus	$\centerdot$	\centerdot		
$\ltimes$	\ltimes	$\rtimes$	\rtimes	$\divideontimes$	\divideontimes
$\Cup$	\doublecup	$\Cap$	\doublecap	$\smallsetminus$	\smallsetminus
$\veebar$	\veebar	$\barwedge$	\barwedge	$\Barwedge$	\doublebarwedge
$\boxplus$	\boxplus	$\boxminus$	\boxminus	$\circleddash$	\circleddash
$\boxtimes$	\boxtimes	$\boxdot$	\boxdot	$\circledcirc$	\circledcirc
$\intercal$	\intercal	$\circledast$	\circledast	$\rightthreetimes$	\rightthreetimes
$\curlyvee$	\curlyvee	$\curlywedge$	\curlywedge	$\leftthreetimes$	\leftthreetimes

Table 16: $\mathcal{AMS}$ Binary Relations.

$\lessdot$	\lessdot	$\gtrdot$	\gtrdot	$\doteqdot$	\doteqdot
$\leqslant$	\leqslant	$\geqslant$	\geqslant	$\risingdotseq$	\risingdotseq
$\eqslantless$	\eqslantless	$\eqslantgtr$	\eqslantgtr	$\fallingdotseq$	\fallingdotseq
$\leqq$	\leqq	$\geqq$	\geqq	$\eqcirc$	\eqcirc
$\lll$	\lll or \llless	$\ggg$	\ggg	$\circeq$	\circeq
$\lesssim$	\lesssim	$\gtrsim$	\gtrsim	$\triangleq$	\triangleq
$\lessapprox$	\lessapprox	$\gtrapprox$	\gtrapprox	$\bumpeq$	\bumpeq
$\lessgtr$	\lessgtr	$\gtrless$	\gtrless	$\Bumpeq$	\Bumpeq
$\lesseqgtr$	\lesseqgtr	$\gtreqless$	\gtreqless	$\thicksim$	\thicksim
$\lesseqqgtr$	\lesseqqgtr	$\gtreqqless$	\gtreqqless	$\thickapprox$	\thickapprox

Table 17: $\mathcal{AMS}$ Binary Relations. (... continue)

$\preccurlyeq$	\preccurlyeq	$\succcurlyeq$	\succcurlyeq	$\approxeq$	\approxeq
$\curlyeqprec$	\curlyeqprec	$\curlyeqsucc$	\curlyeqsucc	$\backsim$	\backsim
$\precsim$	\precsim	$\succsim$	\succsim	$\backsimeq$	\backsimeq
$\precapprox$	\precapprox	$\succapprox$	\succapprox	$\vDash$	\vDash
$\subseteqq$	\subseteqq	$\supseteqq$	\supseteqq	$\Vdash$	\Vdash
$\shortparallel$	\shortparallel	$\Supset$	\Supset	$\Vvdash$	\Vvdash
$\blacktriangleleft$	\blacktriangleleft	$\sqsupset$	\sqsupset	$\backepsilon$	\backepsilon
$\vartriangleright$	\vartriangleright	$\because$	\because	$\varpropto$	\varpropto
$\blacktriangleright$	\blacktriangleright	$\Subset$	\Subset	$\between$	\between
$\trianglerighteq$	\trianglerighteq	$\smallfrown$	\smallfrown	$\pitchfork$	\pitchfork
$\vartriangleleft$	\vartriangleleft	$\shortmid$	\shortmid	$\smallsmile$	\smallsmile
$\trianglelefteq$	\trianglelefteq	$\therefore$	\therefore	$\sqsubset$	\sqsubset

Table 18: $\mathcal{AMS}$ Arrows.

⇠	\dashleftarrow	⇢	\dashrightarrow
⇇	\leftleftarrows	⇉	\rightrightarrows
⇆	\leftrightarrows	⇄	\rightleftarrows
⇚	\Lleftarrow	⇛	\Rrightarrow
↞	\twoheadleftarrow	↠	\twoheadrightarrow
↢	\leftarrowtail	↣	\rightarrowtail
⇋	\leftrightharpoons	⇌	\rightleftharpoons
↰	\Lsh	↱	\Rsh
↫	\looparrowleft	↬	\looparrowright
↶	\curvearrowleft	↷	\curvearrowright
↺	\circlearrowleft	↻	\circlearrowright
⊸	\multimap	⇈	\upuparrows
⇊	\downdownarrows	↿	\upharpoonleft
↾	\upharpoonright	⇂	\downharpoonright
⇝	\rightsquigarrow	↭	\leftrightsquigarrow

Table 19: $\mathcal{AMS}$ Negated Binary Relations and Arrows.

$\not<$	\nless	$\not>$	\ngtr	$\not\subsetneqq$	\varsubsetneqq
$\lneq$	\lneq	$\gneq$	\gneq	$\not\supsetneqq$	\varsupsetneqq
$\not\leqq$	\nleq	$\not\geqq$	\ngeq	$\not\subseteqq$	\nsubseteqq
$\not\leqslant$	\nleqslant	$\not\geqslant$	\ngeqslant	$\not\supseteqq$	\nsupseteqq
$\lneqq$	\lneqq	$\gneqq$	\gneqq	$\nmid$	\nmid
$\lvertneqq$	\lvertneqq	$\gvertneqq$	\gvertneqq	$\nparallel$	\nparallel
$\not\leqq$	\nleqq	$\not\geqq$	\ngeqq	$\not\mid$	\nshortmid
$\lnsim$	\lnsim	$\gnsim$	\gnsim	$\not\parallel$	\nshortparallel
$\lnapprox$	\lnapprox	$\gnapprox$	\gnapprox	$\not\sim$	\nsim
$\not\prec$	\nprec	$\not\succ$	\nsucc	$\not\cong$	\ncong
$\not\preceq$	\npreceq	$\not\succeq$	\nsucceq	$\nvdash$	\nvdash
$\not\preccurlyeq$	\precneqq	$\not\succcurlyeq$	\succneqq	$\nvDash$	\nvDash
$\precnsim$	\precnsim	$\succnsim$	\succnsim	$\nVdash$	\nVdash
$\precnapprox$	\precnapprox	$\succnapprox$	\succnapprox	$\nVDash$	\nVDash
$\not\subseteq$	\subsetneq	$\not\supseteq$	\supsetneq	$\not\triangleleft$	\ntriangleleft
$\not\subseteq$	\varsubsetneq	$\not\supseteq$	\varsupsetneq	$\not\triangleright$	\ntriangleright
$\not\subseteq$	\nsubseteq	$\not\supseteq$	\nsupseteq	$\not\trianglelefteq$	\ntrianglelefteq
$\not\subseteq$	\subsetneqq	$\not\supseteq$	\supsetneqq	$\not\trianglerighteq$	\ntrianglerighteq
$\not\leftarrow$	\nleftarrow	$\not\rightarrow$	\nrightarrow	$\not\leftrightarrow$	\nleftrightarrow
$\not\Leftarrow$	\nLeftarrow	$\not\Rightarrow$	\nRightarrow	$\not\Leftrightarrow$	\nLeftrightarrow

Table 20: $\mathcal{AMS}$ Miscellaneous.

$\hbar$	\hbar	$\hslash$	\hslash	$\Bbbk$	\Bbbk
$\square$	\square	$\blacksquare$	\blacksquare	Ⓢ	\circledS
$\vartriangle$	\vartriangle	$\blacktriangle$	\blacktriangle	$\complement$	\complement
$\triangledown$	\triangledown	$\blacktriangledown$	\blacktriangledown	$\Game$	\Game
$\lozenge$	\lozenge	$\blacklozenge$	\blacklozenge	$\bigstar$	\bigstar
$\angle$	\angle	$\measuredangle$	\measuredangle		
$\diagup$	\diagup	$\diagdown$	\diagdown	$\backprime$	\backprime
$\nexists$	\nexists	$\Finv$	\Finv	$\varnothing$	\varnothing
$\eth$	\eth	$\sphericalangle$	\sphericalangle	$\mho$	\mho

Package List

Liu Yihao

These are the packages you are most likely to use in daily LaTeX writing.

- geometry
- amsmath
- amssymb
- amsfonts
- multicol
- multirow
- tabu
- graphicx
- subfigure
- hyperref
- ulem
- ctex
- enumerate
- latexsym
- tikz
- listings

Bibliography

- LaTeX 入门, 刘海洋, 电子工业出版社, 2013.6, ISBN 978-7-121-20208-7
- The Not So Short Introduction to LaTeX 2_ε, Tobias Oetiker, Hubert Partl, Irene Hyna and Elisabeth Schlegl, Version 5.05, July 18, 2015 (http://www.ctan.org/tex-archive/info/lshort/english/)
- Introduction to LaTeX, David Reid (https://wenku.baidu.com/view/f08fbdf24693daef5ef73d23.html)

Contributors

This LaTeX beamer slide is contributed to

- Liu Yihao (https://github.com/tc-imba)
- Zhou Yanjun (https://github.com/AuroraZK)
- Zhang Yifei (https://github.com/zhangyifei-chelsea)

For LaTeX lectures of the JI Technology Department.
For all students in JI as a reference in report/homework writing.

This is a long-term maintained project on GitHub, if you have any suggestions, make an issue on it, PRs are welcomed as well.