fmocdmac — FM's OCD LaTeX Macro*

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Abstract

This package contains almost all the latex macros I heavily use in my tcs research activity and, in particular, in the writing of conference and journal articles. As few of my co-authors have kindly pointed out, and probably many have thought, they are somehow a clear expression of an underlying ocd-like behavior... hence the name!

1 Implementation & Usage

1 ⟨*package⟩

Required external packages:

2
```
3 \RequirePackage{etoolbox}
4
5 \RequirePackage{xargs}
6 \RequirePackage{xspace}
7 \RequirePackage{stringstrings}
8
```

Package options:

9
```
10 %% Auxiliary packages
11 \newif\ifaux@ \aux@false
12 \DeclareOption{aux}{\aux@true}
13 \DeclareOption{noaux}{\aux@false}
14
15 %% AMS defaults
16 \newif\ifamsdef@ \amsdef@true
17 \DeclareOption{noamsdef}{\amsdef@false}
18
19 %% AMS theorem tools
20 \newif\ifamsthm@ \amsthm@true
21 \DeclareOption{noamsthm}{\amsthm@false}
22
23 %% Extended Theorem tools
24 \newif\ifthmtls@ \thmtls@true
25 \DeclareOption{nothmtls}{\thmtls@false}
26
27 %% Enumeration tools
28 \newif\ifenmtls@ \enmtls@true
29 \DeclareOption{noenmtls}{\enmtls@false}
30
31 %% Hyper reference
32 \newif\ifhypref@ \hypref@true
33 \DeclareOption{nohypref}{\hypref@false}
34
35 %% Font tools
36 \newif\iffnttls@ \fnttls@true
```

*This document describes version v0.14 of the fmocdmac package, last revised 2023/02/05.

```
\DeclareOption{nofnttls}{\fnttls@false}

%% Camera-ready version
\newif\ifcrv@ \crv@false
\DeclareOption{crv}{\crv@true}

%% Change bars
\newif\ifchgbar@ \chgbar@false
\DeclareOption{chgbar}{\chgbar@true}

%% Line numbers
\newif\iflinnum@ \linnum@false
\DeclareOption{linnum}{\linnum@true}


%% Text macro generation
\newif\iftxtgen@ \txtgen@false
\DeclareOption{txtgen}{\txtgen@true}
\DeclareOption{notxtgen}
  {\txtgen@false\text@false\com@false\gam@false\log@false\aut@false}

%% Math macro generation
\newif\ifmthgen@ \mthgen@false
\DeclareOption{mthgen}{\mthgen@true}
\DeclareOption{nomthgen}
  {\mthgen@false\math@false\gam@false\log@false\aut@false}


%% Elementary macros for text
\newif\iftext@ \text@false
\DeclareOption{text}{\text@true\txtgen@true}
\DeclareOption{notext}{\text@false}

%% Elementary macros for math
\newif\ifmath@ \math@false
\DeclareOption{math}{\math@true\mthgen@true}
\DeclareOption{nomath}{\math@false}


%% Macros for computational-complexity classes
\newif\ifcom@ \com@false
\DeclareOption{com}{\com@true\txtgen@true}
\DeclareOption{nocom}{\com@false}


%% Macros for games
\newif\ifgam@ \gam@false
\DeclareOption{gam}{\gam@true\txtgen@true\mthgen@true}
\DeclareOption{nogam}{\gam@false}

%% Macros for logics
\newif\iflog@ \log@false
\DeclareOption{log}{\log@true\txtgen@true\mthgen@true}
\DeclareOption{nolog}{\log@false}

%% Macros for automata
\newif\ifaut@ \aut@false
\DeclareOption{aut}{\aut@true\txtgen@true\mthgen@true}
\DeclareOption{noaut}{\aut@false}


%% Format-related tricks
\newif\iffrm@ \frm@false
```

```
\DeclareOption{frm}{\frm@true}
\DeclareOption{nofrm}{\frm@false}


%% Figure-related tricks
\newif\iffig@ \fig@false
\DeclareOption{fig}{\fig@true}
\DeclareOption{nofig}{\fig@false}

%% Wrapfig package
\newif\ifwrpfig@ \wrpfig@true
\DeclareOption{nowrpfig}{\wrpfig@false}


%% Table-related tricks
\newif\iftab@ \tab@false
\DeclareOption{tab}{\tab@true}
\DeclareOption{notab}{\tab@false}


%% Algorithm-related tricks
\newif\ifalg@ \alg@false
\DeclareOption{alg}{\alg@true}
\DeclareOption{noalg}{\alg@false}

```

Option-processing code:

```

\DeclareOption*{\PackageWarning{fmocdmac}{Unknown~`\CurrentOption'}}%

\ExecuteOptions{aux,txtgen,mthgen,text,math,com,gam,log,aut}%

\ProcessOptions\relax%

\ifcsdef{if@twocolumn}{}{\newif\if@twocolumn}

%%*****************************************************************************%%
%%** Auxiliary Tricks ********************************************************%%
%%*****************************************************************************%%
\ifaux@

\ifamsdef@
  % AMS Packages
  \RequirePackage{amsmath}
  \RequirePackage{amssymb}
  \RequirePackage{stmaryrd}
  \interdisplaylinepenalty=2500
\fi

\ifamsthm@
  % AMS Theorem Tools
  \RequirePackage{amsthm}
\fi

\ifthmtls@
  % Extended Theorem Tools
  \RequirePackage{thmtools, thm-restate}
\fi

\ifenmtls@
  % Enumeration Tools
  \RequirePackage{paralist}
\fi

```

```
\ifhypref@
  % Hyper References
  \RequirePackage{hyperref}
  \hypersetup {
    pdfsubject    = {},
    pdfkeywords   = {},
    pdfproducer   = {},
    pdfcreator    = {},
    pdfpagemode   = {UseNone},
    pdfstartview  = {FitH},
    urlcolor      = {blue},
    colorlinks
  }
\fi

\iffnttls@
  % Font Tools
  \RequirePackage[final]{microtype}
\fi

\ifcrv@
  % Camera-Ready Version

  %%...

\else
  % Draft Version

  %%...

  \ifchgbar@
    % Change Bars
    \RequirePackage{changebar}
  \fi

  \iflinnum@
    % Line Numbers
    \if@twocolumn
      \RequirePackage[switch, columnwise, mathlines]{lineno}\linenumbers
    \else
      \RequirePackage[columnwise, mathlines]{lineno}\linenumbers
    \fi
  \fi

  %%...

\fi

\fi
%%*************************************************************************%%
%%*************************************************************************%%
%%** Auxiliary Font Declarations *******************************************%%
%%*************************************************************************%%
```

\mathbbo **Bbo Math Font:** ... to do!

```
\ifdef{\mathbbo}{}{\DeclareMathAlphabet{\mathbbo}{U}{bbold}{m}{n}}
```

\matheus **Eus Math Font:** ... to do!

```
\ifdef{\matheus}{}{\DeclareMathAlphabet{\matheus}{U}{eus}{m}{n}}
```

\mathpzc **Pzc Math Font:** ... to do!

```
\ifdef{\mathpzc}{}{\DeclareMathAlphabet{\mathpzc}{T1}{pzc}{m}{it}}
```

\mathscr **Scr Math Font:** ... to do!

```
\ifdef{\mathscr}{}{\DeclareMathAlphabet{\mathscr}{U}{rsfs}{m}{n}}

%%*****************************************************************************%%
%%*****************************************************************************%%
%%** Auxiliary Alphabet Letters ************************************************%%
%%*****************************************************************************%%
```

\omicron **Auxiliary Greek lowercase letter:** ... to do!

```
\csdef{omicron}{o}
```

\Alpha, ... **Auxiliary Greek uppercase letters:** ... to do!

```
\csdef{Alpha}{A} \csdef{Beta}{B} \csdef{Epsilon}{E} \csdef{varEpsilon}{E}
\csdef{Zeta}{Z} \csdef{Eta}{H} \csdef{Iota}{I} \csdef{Kappa}{K}
\csdef{varKappa}{K} \csdef{Mu}{M} \csdef{Nu}{N} \csdef{Omicron}{O}
\csdef{Rho}{P} \csdef{varRho}{P} \csdef{Tau}{T} \csdef{Chi}{X}

%%*****************************************************************************%%
%%*****************************************************************************%%
%%** Tools **********************************************************************%%
%%*****************************************************************************%%
```

\empchk **Emptiness check:** `\empchk{`$\langle A\rangle$`}{`$\langle B\rangle$`}` evaluates to the empty string, if Argument $\langle A\rangle$ is empty, and to Argument $\langle B\rangle$, otherwise.

- `\empchk{}{B}` = “”
- `\empchk{A}{B}` = “B”

```
\newcommand{\empchk}[2]
  {\if&#1&\else#2\fi}
```

\defval **Default value:** `\defval{`$\langle A\rangle$`}{`$\langle B\rangle$`}` evaluates to Argument $\langle B\rangle$, if Argument $\langle A\rangle$ is empty, and to Argument $\langle A\rangle$ itself, otherwise.

- `\defval{}{B}` = “B”
- `\defval{A}{B}` = “A”

```
\newcommand{\defval}[2]
  {\if&#1&#2\else#1\fi}

%%*****************************************************************************%%
```

\arglef **Left extension:** `\arglef{`$\langle A\rangle$`}{`$\langle B\rangle$`}` evaluates to the concatenation $\langle AB\rangle$ of the two arguments, if Argument $\langle B\rangle$ is non-empty, and to the empty string, otherwise.

- `\arglef{A}{}` = “”
- `\arglef{A}{B}` = “AB”

```
\newcommand{\arglef}[2]
  {\empchk{#2}{#1#2}}
```

\argrig **Right extension:** `\argrig{`$\langle A\rangle$`}{`$\langle B\rangle$`}` evaluates to the concatenation $\langle AB\rangle$ of the two arguments, if Argument $\langle A\rangle$ is non-empty, and to the empty string, otherwise.

- `\argrig{}{B}` = “”
- `\argrig{A}{B}` = “AB”

```
\newcommand{\argrig}[2]
  {\empchk{#1}{#1#2}}
```

\argmid **Middle extension:** `\argmid{`$\langle A\rangle$`}{`$\langle B\rangle$`}{`$\langle C\rangle$`}` evaluates to the concatenation $\langle ABC\rangle$ of the three arguments, if Argument $\langle B\rangle$ is non-empty, and to the empty string, otherwise.

- `\argmid{A}{}{C}` = “”
- `\argmid{A}{B}{C}` = “ABC”

```
\newcommand{\argmid}[3]
  {\empchk{#2}{#1#2#3}}
```

\argsep **Separators:** \argsep{⟨A⟩}{⟨B⟩}{⟨C⟩} evaluates to Argument ⟨C⟩, if Argument ⟨A⟩ is empty, to Argument ⟨A⟩, if Argument ⟨C⟩ is empty, and to the concatenation ⟨ABC⟩, otherwise.

- \argsep{}{B}{C} = "C"
- \argsep{A}{B}{} = "A"
- \argsep{A}{}{C} = "AC"
- \argsep{A}{B}{C} = "ABC"

```
\newcommand{\argsep}[3]
  {\if&#1&#3\else#1\arglef{#2}{#3}\fi}

%%*****************************************************************************%%
```

\varcmd **Variadic commands:** \varcmd{⟨A⟩}{⟨B⟩}{⟨C⟩}{⟨D⟩}{⟨E⟩}{⟨F⟩} ... to do!

```
\newcommand{\varcmd}[6]
  {\expandafter\newcommand\csname gobble#1arg\endcsname[2]
    {\csname check#1arg\endcsname{\argsep{##1}{#4}{\empchk{##2}{{##2}}}}}%
  \expandafter\newcommand\csname check#1arg\endcsname[1]
    {\csname @ifnextchar\endcsname%
      \bgroup{\csname gobble#1arg\endcsname{##1}}{#2{##1#5}#6}}%
  \expandafter\newcommand\csname#1\endcsname[1]
    {\csname check#1arg\endcsname{#3##1}}}

%%*****************************************************************************%%
```

\seqoftag **Sequence of tags:** \seqoftag{⟨A⟩}{⟨B⟩}{⟨C⟩} ... to do!

```
\newcommand{\seqoftag}[3]
  {\@for\itr:={#1}\do%
    {\expandafter\csedef{\itr#2}%
      {\noexpand\csname #3\endcsname{\itr}}}}
```

\seqofcmd **Sequence of commands:** \seqofcmd{⟨A⟩}{⟨B⟩}{⟨C⟩} ... to do!

```
\newcommand{\seqofcmd}[3]
  {\@for\itr:={#1}\do%
    {\expandafter\csedef{\itr#2}%
      {\noexpand\csname #3\endcsname{\csname \itr\endcsname}}}}

%%*****************************************************************************%%
```

\seqoflatlow **Sequence of Latin lowercase letters:** \seqoflatlow{⟨A⟩}{⟨B⟩} ... to do!

```
\newcommand{\seqoflatlow}
  {\seqoftag{a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z}}
```

\seqoflatupp **Sequence of Latin uppercase letters:** \seqoflatupp{⟨A⟩}{⟨B⟩} ... to do!

```
\newcommand{\seqoflatupp}
  {\seqoftag{A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z}}
```

\seqoflatlet **Sequence of Latin letters:** \seqoflatlet{⟨A⟩}{⟨B⟩} ... to do!

```
\newcommand{\seqoflatlet}[2]
  {\seqoflatlow{#1}{#2}\seqoflatupp{#1}{#2}}

%%*****************************************************************************%%
```

\seqofgrklow **Sequence of Greek lowercase letters:** \seqofgrklow{⟨A⟩}{⟨B⟩} ... to do!

```
\newcommand{\seqofgrklow}
  {\seqofcmd{alpha,beta,gamma,delta,epsilon,varepsilon,zeta,eta,theta,vartheta,%
  iota,kappa,varkappa,lambda,mu,nu,xi,omicron,pi,varpi,rho,varrho,sigma,%
  varsigma,tau,upsilon,phi,varphi,chi,psi,omega}}
```

\seqofgrkupp **Sequence of Greek uppercase letters:** \seqofgrkupp{⟨A⟩}{⟨B⟩} ... to do!

```
\newcommand{\seqofgrkupp}
  {\seqofcmd{Alpha,Beta,Gamma,Delta,Epsilon,varEpsilon,Zeta,Eta,Theta,varTheta,%
  Iota,Kappa,varKappa,Lambda,Mu,Nu,Xi,Omicron,Pi,varPi,Rho,varRho,Sigma,%
  varSigma,Tau,Upsilon,Phi,varPhi,Chi,Psi,Omega}}
```

\seqofgrklet **Sequence of Greek letters:** \seqofgrklet{⟨A⟩}{⟨B⟩} ... to do!

```
\newcommand{\seqofgrklet}[2]
  {\seqofgrklow{#1}{#2}\seqofgrkupp{#1}{#2}}

%%*************************************************************************%%
```

\seqoflow **Sequence of lowercase letters:** \seqoflow{⟨A⟩}{⟨B⟩} ... to do!

```
\newcommand{\seqoflow}[2]
  {\seqoflatlow{#1}{#2}\seqofgrklow{#1}{#2}}
```

\seqofupp **Sequence of uppercase letters:** \seqofupp{⟨A⟩}{⟨B⟩} ... to do!

```
\newcommand{\seqofupp}[2]
  {\seqoflatupp{#1}{#2}\seqofgrkupp{#1}{#2}}
```

\seqoflet **Sequence of all letters:** \seqoflet{⟨A⟩}{⟨B⟩} ... to do!

```
\newcommand{\seqoflet}[2]
  {\seqoflow{#1}{#2}\seqofupp{#1}{#2}}

%%*************************************************************************%%

%%*************************************************************************%%
%%** Text Meta Commands ***************************************************%%
%%*************************************************************************%%
```

\newtxt ... to do!

- \newtxt[\rmfamily]{Name}[sub][sup][Ext] = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{Ext}$"
- \newtxt[\sffamily]{Name}[sub][sup][Ext] = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}\mathsf{Ext}$"
- \newtxt[\ttfamily]{Name}[sub][sup][Ext] = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{Ext}$"

```
\newcommandx{\newtxt}[5][1=, 3=, 4=, 5=]
  {\text{#1#2\txtsubsup[#1]{#3}{#4}#5}\xspace}
```

\newtxtsty ... to do!

- \newtxtsty{\rmfamily}{Name}[sub][sup][Ext] = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{Ext}$"
- \newtxtsty{\rmfamily}[\sffamily]{Name}[sub][sup][Ext] = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}\mathsf{Ext}$"
- \newtxtsty{\rmfamily}[\ttfamily]{Name}[sub][sup][Ext] = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{Ext}$"

```
\newcommandx{\newtxtsty}[2][2=]
  {\newtxt[\defval{#2}{#1}]}
```

\newtxtarg ... to do!

- \newtxtarg[\rmfamily]{Name}[sub][sup][Ext1]{Arg}[Ext2] = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{Ext1(Arg)Ext2}$"
- \newtxtarg[\sffamily]{Name}[sub][sup][Ext1]{Arg}[Ext2] = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}\mathsf{Ext1(Arg)Ext2}$"
- \newtxtarg[\ttfamily]{Name}[sub][sup][Ext1]{Arg}[Ext2] = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{Ext1(Arg)Ext2}$"

```
\newcommandx{\newtxtarg}[7][1=, 3=, 4=, 5=, 7=]
  {\newtxt[#1]{#2}[#3][#4][\argmid{#5(){#6}{)#7}]}
```

\newtxtargsty ... to do!

- \newtxtargsty{\rmfamily}{Name}[sub][sup][Ext1]{Arg}[Ext2] = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{Ext1(Arg)Ext2}$"
- \newtxtargsty{\rmfamily}[\sffamily]{Name}[sub][sup][Ext1]{Arg}[Ext2] = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}\mathsf{Ext1(Arg)Ext2}$"
- \newtxtargsty{\rmfamily}[\ttfamily]{Name}[sub][sup][Ext1]{Arg}[Ext2] = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{Ext1(Arg)Ext2}$"

```
\newcommandx{\newtxtargsty}[2][2=]
  {\newtxtarg[\defval{#2}{#1}]}
```

\newtxtoarg ... to do!

- \newtxtoarg[\rmfamily]{Name}[sub][sup][Arg] = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{(Arg)}$"
- \newtxtoarg[\sffamily]{Name}[sub][sup][Arg] = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}\mathsf{(Arg)}$"
- \newtxtoarg[\ttfamily]{Name}[sub][sup][Arg] = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{(Arg)}$"

```
\newcommandx{\newtxtoarg}[5][1=, 3=, 4=, 5=]
  {\newtxtarg[#1]{#2}[#3][#4][]{#5}[]}
```

`\newtxtoargsty` ... to do!

- `\newtxtoargsty{\rmfamily}{Name}[sub][sup][Arg]` = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}(\mathrm{Arg})$"
- `\newtxtoargsty{\rmfamily}[\sffamily]{Name}[sub][sup][Arg]` = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}(\mathsf{Arg})$"
- `\newtxtoargsty{\rmfamily}[\ttfamily]{Name}[sub][sup][Arg]` = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{(Arg)}$"

```
\newcommandx{\newtxtoargsty}[2][2=]
  {\newtxtoarg[\defval{#2}{#1}]}
```

`\newtxtpar` ... to do!

- `\newtxtpar[\rmfamily]{Name}[sub][sup][Ext1]{Par}[Ext2]` = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{Ext1[Par]Ext2}$"
- `\newtxtpar[\sffamily]{Name}[sub][sup][Ext1]{Par}[Ext2]` = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}\mathsf{Ext1[Par]Ext2}$"
- `\newtxtpar[\ttfamily]{Name}[sub][sup][Ext1]{Par}[Ext2]` = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{Ext1[Par]Ext2}$"

```
\newcommandx{\newtxtpar}[7][1=, 3=, 4=, 5=, 7=]
  {\newtxt[#1]{#2}[#3][#4][\argmid{#5[}{#6}{]#7}]}
```

`\newtxtparsty` ... to do!

- `\newtxtparsty{\rmfamily}{Name}[sub][sup][Ext1]{Par}[Ext2]` = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{Ext1[Par]Ext2}$"
- `\newtxtparsty{\rmfamily}[\sffamily]{Name}[sub][sup][Ext1]{Par}[Ext2]` = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}\mathsf{Ext1[Par]Ext2}$"
- `\newtxtparsty{\rmfamily}[\ttfamily]{Name}[sub][sup][Ext1]{Par}[Ext2]` = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{Ext1[Par]Ext2}$"

```
\newcommandx{\newtxtparsty}[2][2=]
  {\newtxtpar[\defval{#2}{#1}]}
```

`\newtxtopar` ... to do!

- `\newtxtopar[\rmfamily]{Name}[sub][sup][Par]` = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{[Par]}$"
- `\newtxtopar[\sffamily]{Name}[sub][sup][Par]` = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}\mathsf{[Par]}$"
- `\newtxtopar[\ttfamily]{Name}[sub][sup][Par]` = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{[Par]}$"

```
\newcommandx{\newtxtopar}[5][1=, 3=, 4=, 5=]
  {\newtxtpar[#1]{#2}[#3][#4][]{#5}[]}
```

`\newtxtoparsty` ... to do!

- `\newtxtoparsty{\rmfamily}{Name}[sub][sup][Par]` = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{[Par]}$"
- `\newtxtoparsty{\rmfamily}[\sffamily]{Name}[sub][sup][Par]` = "$\mathsf{Name}_{\mathsf{sub}}^{\mathsf{sup}}\mathsf{[Par]}$"
- `\newtxtoparsty{\rmfamily}[\ttfamily]{Name}[sub][sup][Par]` = "$\mathtt{Name}_{\mathtt{sub}}^{\mathtt{sup}}\mathtt{[Par]}$"

```
\newcommandx{\newtxtoparsty}[2][2=]
  {\newtxtopar[\defval{#2}{#1}]}
```

`\txtsubsup` ... to do!

- `\txtsubsup{sub}{}` = "$_{\mathrm{sub}}$"; `\txtsubsup{}{sup}` = "$^{\mathrm{sup}}$"; `\txtsubsup{sub}{sup}` = "$_{\mathrm{sub}}^{\mathrm{sup}}$"
- `\txtsubsup[\sffamily]{Aa}{Bb}` = "$^{\mathsf{Bb}}_{\mathsf{Aa}}$"
- `\txtsubsup[\ttfamily]{Aa}{Bb}` = "$^{\mathtt{Bb}}_{\mathtt{Aa}}$"

```
\newcommand{\txtsubsup}[3][]
  {\ensuremath{\empchk{#2}{_{\text{#1#2}}}\empchk{#3}{^{\text{#1#3}}}}}
```

```
%%*************************************************************************%%
```

`\txt` ... to do!

- `\txt{Name}[sub][sup][Ext]` = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{Ext}$"
- `\txt[\scshape]{Name}[sub][sup][Ext]` = "$\textsc{Name}_{\textsc{sub}}^{\textsc{sup}}\textsc{Ext}$"
- `\txt[\bfseries]{Name}[sub][sup][Ext]` = "$\mathbf{Name}_{\mathbf{sub}}^{\mathbf{sup}}\mathbf{Ext}$"

```
\newcommand{\txt}
  {\newtxtsty{\txtsty}}
```

`\txtarg` ... to do!

- `\txtarg{Name}[sub][sup][Ext1]{Arg}[Ext2]` = "$\mathrm{Name}_{\mathrm{sub}}^{\mathrm{sup}}\mathrm{Ext1(Arg)Ext2}$"
- `\txtarg[\scshape]{Name}[sub][sup][Ext1]{Arg}[Ext2]` = "$\textsc{Name}_{\textsc{sub}}^{\textsc{sup}}\textsc{Ext1}(\textsc{Arg})\textsc{Ext2}$"

- `\txtarg[\bfseries]{Name}[sub][sup][Ext1]{Arg}[Ext2]` = "$\mathbf{Name_{sub}^{sup}Ext1(Arg)Ext2}$"

```
\newcommand{\txtarg}
  {\newtxtargsty{\txtsty}}
```

`\txtoarg` ... to do!

- `\txtoarg{Name}[sub][sup][Arg]` = "$\mathrm{Name_{sub}^{sup}(Arg)}$"
- `\txtoarg[\scshape]{Name}[sub][sup][Arg]` = "$\mathrm{NAME_{SUB}^{SUP}(ARG)}$"
- `\txtoarg[\bfseries]{Name}[sub][sup][Arg]` = "$\mathbf{Name_{sub}^{sup}(Arg)}$"

```
\newcommand{\txtoarg}
  {\newtxtoargsty{\txtsty}}
```

`\txtpar` ... to do!

- `\txtpar{Name}[sub][sup][Ext1]{Par}[Ext2]` = "$\mathrm{Name_{sub}^{sup}Ext1[Par]Ext2}$"
- `\txtpar[\scshape]{Name}[sub][sup][Ext1]{Par}[Ext2]` = "$\mathrm{NAME_{SUB}^{SUP}EXT1[PAR]EXT2}$"
- `\txtpar[\bfseries]{Name}[sub][sup][Ext1]{Par}[Ext2]` = "$\mathbf{Name_{sub}^{sup}Ext1[Par]Ext2}$"

```
\newcommand{\txtpar}
  {\newtxtparsty{\txtsty}}
```

`\txtopar` ... to do!

- `\txtopar{Name}[sub][sup][Par]` = "$\mathrm{Name_{sub}^{sup}[Par]}$"
- `\txtopar[\scshape]{Name}[sub][sup][Par]` = "$\mathrm{NAME_{SUB}^{SUP}[PAR]}$"
- `\txtopar[\bfseries]{Name}[sub][sup][Par]` = "$\mathbf{Name_{sub}^{sup}[Par]}$"

```
\newcommand{\txtopar}
  {\newtxtoparsty{\txtsty}}
```

`\txtsty` ... to do!

```
\newcommand{\txtsty}
  {\mdseries\upshape\rmfamily}

%%*************************************************************************%%
```

`\cmdtxt` ... to do!

- `\cmdtxt{NewCmd}`; `\newcommand{txtstyNewCmd}{\scshape\ttfamily}`; `\txtNewCmd{Name}[sub][sup][Ext]` = $\mathrm{NAME_{SUB}^{SUP}EXT}$

```
\newcommand{\cmdtxt}[1]
  {\csdef{txt#1}{\newtxtsty{\csname txtsty#1\endcsname}}}
```

`\cmdtxtarg` ... to do!

- `\cmdtxtarg{NewCmd}`; `\newcommand{txtstyNewCmd}{\scshape\ttfamily}`; `\txtargNewCmd{Name}[sub][sup][Ext1]{Arg}[Ext2]` = $\mathrm{NAME_{SUB}^{SUP}EXT1(ARG)EXT2}$

```
\newcommand{\cmdtxtarg}[1]
  {\csdef{txtarg#1}{\newtxtargsty{\csname txtsty#1\endcsname}}}
```

`\cmdtxtoarg` ... to do!

- `\cmdtxtoarg{NewCmd}`; `\newcommand{txtstyNewCmd}{\scshape\ttfamily}`; `\txtoargNewCmd{Name}[sub][sup][Arg]` = $\mathrm{NAME_{SUB}^{SUP}(ARG)}$

```
\newcommand{\cmdtxtoarg}[1]
  {\csdef{txtoarg#1}{\newtxtoargsty{\csname txtsty#1\endcsname}}}
```

`\cmdtxtpar` ... to do!

- `\cmdtxtpar{NewCmd}`; `\newcommand{txtstyNewCmd}{\scshape\ttfamily}`; `\txtparNewCmd{Name}[sub][sup][Ext1]{Par}[Ext2]` = $\mathrm{NAME_{SUB}^{SUP}EXT1[PAR]EXT2}$

```
\newcommand{\cmdtxtpar}[1]
  {\csdef{txtpar#1}{\newtxtparsty{\csname txtsty#1\endcsname}}}
```

`\cmdtxtopar` ... to do!

- `\cmdtxtopar{NewCmd}`; `\newcommand{txtstyNewCmd}{\scshape\ttfamily}`;
  `\txtoparNewCmd{Name}[sub][sup][Par]` = $\textsc{Name}^{\textsc{sup}}_{\textsc{sub}}[\textsc{Par}]$

```
\newcommand{\cmdtxtopar}[1]
  {\csdef{txtopar#1}{\newtxtoparsty{\csname txtsty#1\endcsname}}}
```

`\cmdtxtall` ... to do!

- `\cmdtxtall{NewCmd}`; `\newcommand{txtstyNewCmd}{\scshape\ttfamily}`;
  `\txtNewCmd{Name}[sub][sup][Ext]` = $\textsc{Name}^{\textsc{sup}}_{\textsc{sub}}\textsc{Ext}$
  `\txtargNewCmd{Name}[sub][sup][Ext1]{Arg}[Ext2]` = $\textsc{Name}^{\textsc{sup}}_{\textsc{sub}}\textsc{Ext1(Arg)Ext2}$
  `\txtoargNewCmd{Name}[sub][sup][Arg]` = $\textsc{Name}^{\textsc{sup}}_{\textsc{sub}}\textsc{(Arg)}$
  `\txtparNewCmd{Name}[sub][sup][Ext1]{Par}[Ext2]` = $\textsc{Name}^{\textsc{sup}}_{\textsc{sub}}\textsc{Ext1[Par]Ext2}$
  `\txtoparNewCmd{Name}[sub][sup][Par]` = $\textsc{Name}^{\textsc{sup}}_{\textsc{sub}}\textsc{[Par]}$

```
\newcommand{\cmdtxtall}[1]
  {\cmdtxt{#1}\cmdtxtarg{#1}\cmdtxtoarg{#1}\cmdtxtpar{#1}\cmdtxtopar{#1}}

%%*************************************************************************%%
```

`\usrtxt` ... to do!

- `\usrtxt{cmdName}{Suf}{}`; `\cmdNameSuf` = cmdName
  `\usrtxt{cmdName}{Suf}{arg}`; `\cmdNameSuf{Arg}` = cmdName(Arg)
  `\usrtxt{cmdName}{Suf}{par}`; `\cmdNameSuf{Par}` = cmdName[Par]
- `\usrtxt{cmdName}{Suf}{}[newName]`; `\cmdNameSuf` = newName
  `\usrtxt{cmdName}{Suf}{arg}[newName]`; `\cmdNameSuf{Arg}` = newName(Arg)
  `\usrtxt{cmdName}{Suf}{par}[newName]`; `\cmdNameSuf{Par}` = newName[Par]

```
\newcommandx{\usrtxt}[4][4=]
  {\csdef{#1#2}{\csname txt#3\endcsname{\defval{#4}{#1}}}}

%%*************************************************************************%%

%%*************************************************************************%%
%%** Math Meta Commands ***************************************************%%
%%*************************************************************************%%
```

`\newmth` ... to do!

- `\newmth[mathrm]{Name}[sub][sup][Ext]` = "$\mathrm{Name}^{sup}_{sub}Ext$"
- `\newmth[mathsf]{Name}[sub][sup][Ext]` = "$\mathsf{Name}^{sup}_{sub}Ext$"
- `\newmth[mathtt]{Name}[sub][sup][Ext]` = "$\mathtt{Name}^{sup}_{sub}Ext$"

```
\newcommandx{\newmth}[5][1=, 3=, 4=, 5=]
  {\ensuremath{\csname#1\endcsname{#2}\mthsubsup{#3}{#4}#5}}
```

`\newmthsty` ... to do!

- `\newmthsty{mathrm}{Name}[sub][sup][Ext]` = "$\mathrm{Name}^{sup}_{sub}Ext$"
- `\newmthsty{mathrm}[mathsf]{Name}[sub][sup][Ext]` = "$\mathsf{Name}^{sup}_{sub}Ext$"
- `\newmthsty{mathrm}[mathtt]{Name}[sub][sup][Ext]` = "$\mathtt{Name}^{sup}_{sub}Ext$"

```
\newcommandx{\newmthsty}[2][2=]
  {\newmth[\defval{#2}{#1}]}
```

`\newmtharg` ... to do!

- `\newmtharg[mathrm]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathrm{Name}^{sup}_{sub}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$"
- `\newmtharg[mathsf]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathsf{Name}^{sup}_{sub}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$"
- `\newmtharg[mathtt]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}^{sup}_{sub}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$"
- `\newmtharg*[mathrm]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathrm{Name}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$"
- `\newmtharg*[mathsf]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathsf{Name}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$"
- `\newmtharg*[mathtt]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$"

```
\newcommand{\newmtharg}
  {\@ifstar{\@snewmtharg}{\@newmtharg}}
\newcommandx{\@newmtharg}[7][1=, 3=, 4=, 5=, 7=]
  {\newmth[#1]{#2}[#3][#4][\argmid{#5\!\left(}{#6}{\right)\arglef{\!}{#7}}]}
\newcommandx{\@snewmtharg}[7][1=, 3=, 4=, 5=, 7=]
  {\newmth[#1]{#2}[#3][#4][\argmid{#5(}{#6}{)#7}]}
```

`\newmthargsty` ... to do!

- `\newmthargsty{mathrm}{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathrm{Name}_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$"
- `\newmthargsty{mathrm}[mathsf]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathsf{Name}_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$"
- `\newmthargsty{mathrm}[mathtt]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$"
- `\newmthargsty*{mathrm}{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathrm{Name}_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$"
- `\newmthargsty*{mathrm}[mathsf]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathsf{Name}_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$"
- `\newmthargsty*{mathrm}[mathtt]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$"

```
\newcommand{\newmthargsty}
  {\@ifstar{\@snewmthargsty}{\@newmthargsty}}
\newcommandx{\@newmthargsty}[2][2=]
  {\newmtharg[\defval{#2}{#1}]}
\newcommandx{\@snewmthargsty}[2][2=]
  {\newmtharg*[\defval{#2}{#1}]}
```

`\newmthoarg` ... to do!

- `\newmthoarg[mathrm]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}\left(Arg^{Ex^{Ex}}\right)$"
- `\newmthoarg[mathsf]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathsf{Name}_{sub}^{sup}\left(Arg^{Ex^{Ex}}\right)$"
- `\newmthoarg[mathtt]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathtt{Name}_{sub}^{sup}\left(Arg^{Ex^{Ex}}\right)$"
- `\newmthoarg*[mathrm]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$"
- `\newmthoarg*[mathsf]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathsf{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$"
- `\newmthoarg*[mathtt]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathtt{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$"

```
\newcommand{\newmthoarg}
  {\@ifstar{\@snewmthoarg}{\@newmthoarg}}
\newcommandx{\@newmthoarg}[5][1=, 3=, 4=, 5=]
  {\newmtharg[#1]{#2}[#3][#4][]{#5}[]}
\newcommandx{\@snewmthoarg}[5][1=, 3=, 4=, 5=]
  {\newmtharg*[#1]{#2}[#3][#4][]{#5}[]}
```

`\newmthoargsty` ... to do!

- `\newmthoargsty{mathrm}{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}\left(Arg^{Ex^{Ex}}\right)$"
- `\newmthoargsty{mathrm}[mathsf]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathsf{Name}_{sub}^{sup}\left(Arg^{Ex^{Ex}}\right)$"
- `\newmthoargsty{mathrm}[mathtt]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathtt{Name}_{sub}^{sup}\left(Arg^{Ex^{Ex}}\right)$"
- `\newmthoargsty*{mathrm}{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$"
- `\newmthoargsty*{mathrm}[mathsf]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathsf{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$"
- `\newmthoargsty*{mathrm}[mathtt]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathtt{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$"

```
\newcommand{\newmthoargsty}
  {\@ifstar{\@snewmthoargsty}{\@newmthoargsty}}
\newcommandx{\@newmthoargsty}[2][2=]
  {\newmthoarg[\defval{#2}{#1}]}
\newcommandx{\@snewmthoargsty}[2][2=]
  {\newmthoarg*[\defval{#2}{#1}]}
```

`\newmthpar` ... to do!

- `\newmthpar[mathrm]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathrm{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$"
- `\newmthpar[mathsf]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathsf{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$"
- `\newmthpar[mathtt]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$"
- `\newmthpar*[mathrm]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathrm{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$"
- `\newmthpar*[mathsf]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathsf{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$"
- `\newmthpar*[mathtt]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$"

```
\newcommand{\newmthpar}
  {\@ifstar{\@snewmthpar}{\@newmthpar}}
\newcommandx{\@newmthpar}[7][1=, 3=, 4=, 5=, 7=]
  {\newmth[#1]{#2}[#3][#4][\argmid{#5\!\left[}{#6}{\right]\arglef{\!}{#7}}]}
\newcommandx{\@snewmthpar}[7][1=, 3=, 4=, 5=, 7=]
  {\newmth[#1]{#2}[#3][#4][\argmid{#5[}{#6}{]#7}]}
```

`\newmthparsty` ... to do!

- `\newmthparsty{mathrm}{Name}[sub][sup] [Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathrm{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$"
- `\newmthparsty{mathrm}[mathsf]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathsf{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$"
- `\newmthparsty{mathrm}[mathtt]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$"
- `\newmthparsty*{mathrm}{Name}[sub][sup] [Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathrm{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$"
- `\newmthparsty*{mathrm}[mathsf]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathsf{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$"
- `\newmthparsty*{mathrm}[mathtt]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$"

```
\newcommand{\newmthparsty}
  {\@ifstar{\@snewmthparsty}{\@newmthparsty}}
\newcommandx{\@newmthparsty}[2][2=]
  {\newmthpar[\defval{#2}{#1}]}
\newcommandx{\@snewmthparsty}[2][2=]
  {\newmthpar*[\defval{#2}{#1}]}
```

`\newmthopar` ... to do!

- `\newmthopar[mathrm]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$"
- `\newmthopar[mathsf]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathsf{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$"
- `\newmthopar[mathtt]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathtt{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$"
- `\newmthopar*[mathrm]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$"
- `\newmthopar*[mathsf]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathsf{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$"
- `\newmthopar*[mathtt]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathtt{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$"

```
\newcommand{\newmthopar}
  {\@ifstar{\@snewmthopar}{\@newmthopar}}
\newcommandx{\@newmthopar}[5][1=, 3=, 4=, 5=]
  {\newmthpar[#1]{#2}[#3][#4][]{#5}[]}
\newcommandx{\@snewmthopar}[5][1=, 3=, 4=, 5=]
  {\newmthpar*[#1]{#2}[#3][#4][]{#5}[]}
```

`\newmthoparsty` ... to do!

- `\newmthoparsty{mathrm}{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$"
- `\newmthoparsty{mathrm}[mathsf]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathsf{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$"
- `\newmthoparsty{mathrm}[mathtt]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathtt{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$"
- `\newmthoparsty*{mathrm}{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$"

- `\newmthoparsty*{mathrm}[mathsf]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$"
- `\newmthoparsty*{mathrm}[mathtt]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathrm{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$"

```
\newcommand{\newmthoparsty}
  {\@ifstar{\@snewmthoparsty}{\@newmthoparsty}}
\newcommandx{\@newmthoparsty}[2][2=]
  {\newmthopar[\defval{#2}{#1}]}
\newcommandx{\@snewmthoparsty}[2][2=]
  {\newmthopar*[\defval{#2}{#1}]}
```

`\mthsubsup` ... to do!

```
\newcommand{\mthsubsup}[2]
  {\empchk{#1}{_{#1}}\empchk{#2}{^{#2}}}
```

```
%%*************************************************************************%%
```

`\mth` ... to do!

- `\mth{Name}[sub][sup][Ext]` = "$Name_{sub}^{sup}Ext$"
- `\mth[mathbf]{Name}[sub][sup][Ext]` = "$\mathbf{Name}_{sub}^{sup}Ext$"
- `\mth[mathtt]{Name}[sub][sup][Ext]` = "$\mathtt{Name}_{sub}^{sup}Ext$"

```
\newcommand{\mth}
  {\newmthsty{\mthsty}}
```

`\mtharg` ... to do!

- `\mtharg{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$Name_{sub}^{sup}Ext1\Big(Arg^{Ex^{Ex}}\Big)Ext2$"
- `\mtharg[mathbf]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathbf{Name}_{sub}^{sup}Ext1\Big(Arg^{Ex^{Ex}}\Big)Ext2$"
- `\mtharg[mathtt]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}_{sub}^{sup}Ext1\Big(Arg^{Ex^{Ex}}\Big)Ext2$"
- `\mtharg*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$Name_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$"
- `\mtharg*[mathbf]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathbf{Name}_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$"
- `\mtharg*[mathtt]{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$"

```
\newcommand{\mtharg}
  {\@ifstar{\newmthargsty*{\mthsty}}{\newmthargsty{\mthsty}}}
```

`\mthoarg` ... to do!

- `\mthoarg{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$Name_{sub}^{sup}\Big(Arg^{Ex^{Ex}}\Big)$"
- `\mthoarg[mathbf]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathbf{Name}_{sub}^{sup}\Big(Arg^{Ex^{Ex}}\Big)$"
- `\mthoarg[mathtt]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathtt{Name}_{sub}^{sup}\Big(Arg^{Ex^{Ex}}\Big)$"
- `\mthoarg*{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$Name_{sub}^{sup}(Arg^{Ex^{Ex}})$"
- `\mthoarg*[mathbf]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathbf{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$"
- `\mthoarg*[mathtt]{Name}[sub][sup][Arg^{Ex^{Ex}}]` = "$\mathtt{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$"

```
\newcommand{\mthoarg}
  {\@ifstar{\newmthoargsty*{\mthsty}}{\newmthoargsty{\mthsty}}}
```

`\mthpar` ... to do!

- `\mthpar{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$Name_{sub}^{sup}Ext1\Big[Par^{Ex^{Ex}}\Big]Ext2$"
- `\mthpar[mathbf]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathbf{Name}_{sub}^{sup}Ext1\Big[Par^{Ex^{Ex}}\Big]Ext2$"
- `\mthpar[mathtt]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathtt{Name}_{sub}^{sup}Ext1\Big[Par^{Ex^{Ex}}\Big]Ext2$"
- `\mthpar*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$Name_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$"
- `\mthpar*[mathbf]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\mathbf{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$"

- `\mthpar*[mathtt]{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = "$\texttt{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$"

```
\newcommand{\mthpar}
  {\@ifstar{\newmthparsty*{\mthsty}}{\newmthparsty{\mthsty}}}
```

`\mthopar` ... to do!

- `\mthopar{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$Name_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$"
- `\mthopar[mathbf]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathbf{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$"
- `\mthopar[mathtt]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\texttt{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$"
- `\mthopar*{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$Name_{sub}^{sup}[Par^{Ex^{Ex}}]$"
- `\mthopar*[mathbf]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\mathbf{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$"
- `\mthopar*[mathtt]{Name}[sub][sup][Par^{Ex^{Ex}}]` = "$\texttt{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$"

```
\newcommand{\mthopar}
  {\@ifstar{\newmthoparsty*{\mthsty}}{\newmthoparsty{\mthsty}}}
```

`\mthsty` ... to do!

```
\newcommand{\mthsty}
  {}
```

```
%%*************************************************************************%%
```

`\cmdmth` ... to do!

- `\cmdmth{NewCmd}`; `\newcommand{mthstyNewCmd}{\mathtt}`;
  `\mthNewCmd{Name}[sub][sup][Ext]` = $\texttt{Name}_{sub}^{sup}Ext$

```
\newcommand{\cmdmth}[1]
  {\csdef{mth#1}{\newmthsty{mthsty#1}}}
```

`\cmdmtharg` ... to do!

- `\cmdmtharg{NewCmd}`; `\newcommand{mthstyNewCmd}{\mathtt}`;
  `\mthargNewCmd{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$
  `\mthargNewCmd*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$

```
\newcommand{\cmdmtharg}[1]
  {\csdef{mtharg#1}%
    {\@ifstar{\newmthargsty*{mthsty#1}}{\newmthargsty{mthsty#1}}}}
```

`\cmdmthoarg` ... to do!

- `\cmdmthoarg{NewCmd}`; `\newcommand{mthstyNewCmd}{\mathtt}`;
  `\mthoargNewCmd{Name}[sub][sup][Arg^{Ex^{Ex}}]` = $\texttt{Name}_{sub}^{sup}\left(Arg^{Ex^{Ex}}\right)$
  `\mthoargNewCmd*{Name}[sub][sup][Arg^{Ex^{Ex}}]` = $\texttt{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$

```
\newcommand{\cmdmthoarg}[1]
  {\csdef{mthoarg#1}%
    {\@ifstar{\newmthoargsty*{mthsty#1}}{\newmthoargsty{mthsty#1}}}}
```

`\cmdmthpar` ... to do!

- `\cmdmthpar{NewCmd}`; `\newcommand{mthstyNewCmd}{\mathtt}`;
  `\mthparNewCmd{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
  `\mthparNewCmd*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$

```
\newcommand{\cmdmthpar}[1]
  {\csdef{mthpar#1}%
    {\@ifstar{\newmthparsty*{mthsty#1}}{\newmthparsty{mthsty#1}}}}
```

`\cmdmthopar` ... to do!

- `\cmdmthopar{NewCmd}`; `\newcommand{mthstyNewCmd}{\mathtt}`;
  `\mthoparNewCmd{Name}[sub][sup][Par^{Ex^{Ex}}]` = $\texttt{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$
  `\mthoparNewCmd*{Name}[sub][sup][Par^{Ex^{Ex}}]` = $\texttt{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$

```
\newcommand{\cmdmthopar}[1]
  {\csdef{mthopar#1}%
    {\@ifstar{\newmthoparsty*{mthsty#1}}{\newmthoparsty{mthsty#1}}}}
```

`\cmdmthall` ... to do!

- `\cmdmthall{NewCmd}`; `\newcommand{mthstyNewCmd}{\mathtt}`;
  `\mthNewCmd{Name}[sub][sup][Ext]` = $\texttt{Name}_{sub}^{sup}Ext$
  `\mthargNewCmd{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$
  `\mthargNewCmd*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$
  `\mthoargNewCmd{Name}[sub][sup][Arg^{Ex^{Ex}}]` = $\texttt{Name}_{sub}^{sup}\left(Arg^{Ex^{Ex}}\right)$
  `\mthoargNewCmd*{Name}[sub][sup][Arg^{Ex^{Ex}}]` = $\texttt{Name}_{sub}^{sup}(Arg^{Ex^{Ex}})$
  `\mthparNewCmd{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
  `\mthparNewCmd*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$
  `\mthoparNewCmd{Name}[sub][sup][Par^{Ex^{Ex}}]` = $\texttt{Name}_{sub}^{sup}\left[Par^{Ex^{Ex}}\right]$
  `\mthoparNewCmd*{Name}[sub][sup][Par^{Ex^{Ex}}]` = $\texttt{Name}_{sub}^{sup}[Par^{Ex^{Ex}}]$

```
\newcommand{\cmdmthall}[1]
  {\cmdmth{#1}\cmdmtharg{#1}\cmdmthoarg{#1}\cmdmthpar{#1}\cmdmthopar{#1}}

%%*****************************************************************************%%
```

`\usrmth` ... to do!

- `\usrmth{cmdName}{Suf}{}`; `\cmdNameSuf` = $cmdName$
  `\usrmth{cmdName}{Suf}{arg}`;
  `\cmdNameSuf{Arg^{Ex^{Ex}}}` = $cmdName\left(Arg^{Ex^{Ex}}\right)$
  `\cmdNameSuf*{Arg^{Ex^{Ex}}}` = $cmdName(Arg^{Ex^{Ex}})$
  `\usrmth{cmdName}{Suf}{par}`;
  `\cmdNameSuf{Par^{Ex^{Ex}}}` = $cmdName\left[Par^{Ex^{Ex}}\right]$
  `\cmdNameSuf*{Par^{Ex^{Ex}}}` = $cmdName[Par^{Ex^{Ex}}]$
- `\usrmth{cmdName}{Suf}{}[newName]`; `\cmdNameSuf` = $newName$
  `\usrmth{cmdName}{Suf}{arg}[newName]`;
  `\cmdNameSuf{Arg^{Ex^{Ex}}}` = $newName\left(Arg^{Ex^{Ex}}\right)$
  `\cmdNameSuf*{Arg^{Ex^{Ex}}}` = $newName(Arg^{Ex^{Ex}})$
  `\usrmth{cmdName}{Suf}{par}[newName]`;
  `\cmdNameSuf{Par^{Ex^{Ex}}}` = $newName\left[Par^{Ex^{Ex}}\right]$
  `\cmdNameSuf*{Par^{Ex^{Ex}}}` = $newName[Par^{Ex^{Ex}}]$

```
\newcommandx{\usrmth}[4][4=]
  {\csdef{#1#2}{%
    \@ifstar%
      {\csname mth#3\endcsname*{\defval{#4}{#1}}}%
      {\csname mth#3\endcsname{\defval{#4}{#1}}}%
  }}

%%*****************************************************************************%%
```

`\usrmthlatlow` ... to do!

```
\newcommandx{\usrmthlatlow}[4][4=]
  {\usrmth{#1}{#2}{#3}[#4]\seqoflatlow{#1#2}{mth#3}}
```

`\usrmthlatupp` ... to do!

```
\newcommandx{\usrmthlatupp}[4][4=]
  {\usrmth{#1}{#2}{#3}[#4]\seqoflatupp{#1#2}{mth#3}}
```

`\usrmthlatlet` ... to do!

```
\newcommandx{\usrmthlatlet}[4][4=]
  {\usrmth{#1}{#2}{#3}[#4]\seqoflatlet{#1#2}{mth#3}}
```

\usrmthgrklow ... to do!

```
\newcommandx{\usrmthgrklow}[4][4=]
  {\usrmth{#1}{#2}{#3}[#4]\seqofgrklow{#1#2}{mth#3}}
```

\usrmthgrkupp ... to do!

```
\newcommandx{\usrmthgrkupp}[4][4=]
  {\usrmth{#1}{#2}{#3}[#4]\seqofgrkupp{#1#2}{mth#3}}
```

\usrmthgrklet ... to do!

```
\newcommandx{\usrmthgrklet}[4][4=]
  {\usrmth{#1}{#2}{#3}[#4]\seqofgrklet{#1#2}{mth#3}}
```

\usrmthlow ... to do!

```
\newcommandx{\usrmthlow}[4][4=]
  {\usrmth{#1}{#2}{#3}[#4]\seqoflow{#1#2}{mth#3}}
```

\usrmthupp ... to do!

```
\newcommandx{\usrmthupp}[4][4=]
  {\usrmth{#1}{#2}{#3}[#4]\seqofupp{#1#2}{mth#3}}
```

\usrmthlet ... to do!

```
\newcommandx{\usrmthlet}[4][4=]
  {\usrmth{#1}{#2}{#3}[#4]\seqoflet{#1#2}{mth#3}}
```

```
%%*****************************************************************************%%
%%*****************************************************************************%%
%%** Text Macro Generators ****************************************************%%
%%*****************************************************************************%%
\iftxtgen@
```

\txtdef, ... to do!

- \txtdef{Name}[sub][sup][Ext] = $Name_{sub}^{sup}Ext$
- \txtargdef{Name}[sub][sup][Ext1]{Arg}[Ext2] = $Name_{sub}^{sup}Ext1(Arg)Ext2$
- \txtpardef{Name}[sub][sup][Ext1]{Par}[Ext2] = $Name_{sub}^{sup}Ext1[Par]Ext2$

```
%% Style for Definitions
\cmdtxtall{def}\newcommand{\txtstydef}{\normalfont\bfseries\em}
```

\cmdtxtdef ... to do!

- \cmdtxtdef{cmdName};
  \cmdName[sub][sub][ext] = $cmdName_{sub}^{sub}ext$
- \cmdtxtdef{cmdName}[newName];
  \cmdName[sub][sub][ext] = $newName_{sub}^{sub}ext$

```
\newcommandx{\cmdtxtdef}[2][2=]
  {\usrtxt{#1}{}{def}[#2]}
```

\cmdtxtargdef ... to do!

- \cmdtxtargdef{cmdName};
  \cmdName[sub][sub][ext1]{arg}[ext2] = $cmdName_{sub}^{sub}ext1(arg)ext2$
- \cmdtxtargdef{cmdName}[newName];
  \cmdName[sub][sub][ext1]{arg}[ext2] = $newName_{sub}^{sub}ext1(arg)ext2$

```
\newcommandx{\cmdtxtargdef}[2][2=]
  {\usrtxt{#1}{}{argdef}[#2]}
```

\cmdtxtoargdef ... to do!

- \cmdtxtoargdef{cmdName};
  \cmdName[sub][sub][arg] = $cmdName_{sub}^{sub}(arg)$
- \cmdtxtoargdef{cmdName}[newName];
  \cmdName[sub][sub][arg] = $newName_{sub}^{sub}(arg)$

```
\newcommandx{\cmdtxtoargdef}[2][2=]
  {\usrtxt{#1}{}{oargdef}[#2]}
```

`\cmdtxtpardef` ... to do!

- `\cmdtxtpardef{cmdName}`;
  `\cmdName[sub][sub][ext1]{par}[ext2]` = $\boldsymbol{cmdName^{sub}_{sub}ext1[par]ext2}$
- `\cmdtxtpardef{cmdName}[newName]`;
  `\cmdName[sub][sub][ext1]{par}[ext2]` = $\boldsymbol{newName^{sub}_{sub}ext1[par]ext2}$

```
\newcommandx{\cmdtxtpardef}[2][2=]
  {\usrtxt{#1}{}{pardef}[#2]}
```

`\cmdtxtopardef` ... to do!

- `\cmdtxtopardef{cmdName}`;
  `\cmdName[sub][sub][par]` = $\boldsymbol{cmdName^{sub}_{sub}[par]}$
- `\cmdtxtopardef{cmdName}[newName]`;
  `\cmdName[sub][sub][par]` = $\boldsymbol{newName^{sub}_{sub}[par]}$

```
\newcommandx{\cmdtxtopardef}[2][2=]
  {\usrtxt{#1}{}{opardef}[#2]}
```

`\txtabr, ...` ... to do!

- `\txtabr{Name}[sub][sup][Ext]` = $Name^{\mathrm{sup}}_{\mathrm{sub}}Ext$
- `\txtargabr{Name}[sub][sup][Ext1]{Arg}[Ext2]` = $Name^{\mathrm{sup}}_{\mathrm{sub}}Ext1(Arg)Ext2$
- `\txtparabr{Name}[sub][sup][Ext1]{Par}[Ext2]` = $Name^{\mathrm{sup}}_{\mathrm{sub}}Ext1[Par]Ext2$

```
%% Style for Abbreviations
\cmdtxtall{abr}\newcommand{\txtstyabr}{\em}
```

`\cmdtxtabr` ... to do!

- `\cmdtxtabr{cmdName}`;
  `\cmdName[sub][sub][ext]` = $cmdName^{\mathrm{sub}}_{\mathrm{sub}}ext$
- `\cmdtxtabr{cmdName}[newName]`;
  `\cmdName[sub][sub][ext]` = $newName^{\mathrm{sub}}_{\mathrm{sub}}ext$

```
\newcommandx{\cmdtxtabr}[2][2=]
  {\usrtxt{#1}{}{abr}[#2]}
```

`\cmdtxtargabr` ... to do!

- `\cmdtxtargabr{cmdName}`;
  `\cmdName[sub][sub][ext1]{arg}[ext2]` = $cmdName^{\mathrm{sub}}_{\mathrm{sub}}ext1(arg)ext2$
- `\cmdtxtargabr{cmdName}[newName]`;
  `\cmdName[sub][sub][ext1]{arg}[ext2]` = $newName^{\mathrm{sub}}_{\mathrm{sub}}ext1(arg)ext2$

```
\newcommandx{\cmdtxtargabr}[2][2=]
  {\usrtxt{#1}{}{argabr}[#2]}
```

`\cmdtxtoargabr` ... to do!

- `\cmdtxtoargabr{cmdName}`;
  `\cmdName[sub][sub][arg]` = $cmdName^{\mathrm{sub}}_{\mathrm{sub}}(arg)$
- `\cmdtxtoargabr{cmdName}[newName]`;
  `\cmdName[sub][sub][arg]` = $newName^{\mathrm{sub}}_{\mathrm{sub}}(arg)$

```
\newcommandx{\cmdtxtoargabr}[2][2=]
  {\usrtxt{#1}{}{oargabr}[#2]}
```

`\cmdtxtparabr` ... to do!

- `\cmdtxtparabr{cmdName}`;
  `\cmdName[sub][sub][ext1]{par}[ext2]` = $cmdName^{\mathrm{sub}}_{\mathrm{sub}}ext1[par]ext2$
- `\cmdtxtparabr{cmdName}[newName]`;
  `\cmdName[sub][sub][ext1]{par}[ext2]` = $newName^{\mathrm{sub}}_{\mathrm{sub}}ext1[par]ext2$

```
\newcommandx{\cmdtxtparabr}[2][2=]
  {\usrtxt{#1}{}{parabr}[#2]}
```

`\cmdtxtoparabr` ... to do!

- `\cmdtxtoparabr{cmdName}`;
  `\cmdName[sub][sub][par]` = $cmdName^{\text{sub}}_{\text{sub}}[par]$
- `\cmdtxtoparabr{cmdName}[newName]`;
  `\cmdName[sub][sub][par]` = $newName^{\text{sub}}_{\text{sub}}[par]$

```
\newcommandx{\cmdtxtoparabr}[2][2=]
  {\usrtxt{#1}{}{oparabr}[#2]}
```

```
%%*************************************************************************%%
```

`\txtname, ...` ... to do!

- `\txtname{Name}[sub][sup][Ext]` = $\text{Name}^{\text{SUP}}_{\text{SUB}}\text{Ext}$
- `\txtargname{Name}[sub][sup][Ext1]{Arg}[Ext2]` = $\text{Name}^{\text{SUP}}_{\text{SUB}}\text{Ext1}(\text{Arg})\text{Ext2}$
- `\txtparname{Name}[sub][sup][Ext1]{Par}[Ext2]` = $\text{Name}^{\text{SUP}}_{\text{SUB}}\text{Ext1}[\text{Par}]\text{Ext2}$

```
%% Style for Names
\cmdtxtall{name}\newcommand{\txtstyname}{\normalfont\mdseries\scshape\sffamily}
```

`\cmdtxtname` ... to do!

- `\cmdtxtname{cmdName}`;
  `\cmdName[sub][sub][ext]` = $\text{cmdName}^{\text{SUB}}_{\text{SUB}}\text{ext}$
- `\cmdtxtname{cmdName}[newName]`;
  `\cmdName[sub][sub][ext]` = $\text{newName}^{\text{SUB}}_{\text{SUB}}\text{ext}$

```
\newcommandx{\cmdtxtname}[2][2=]
  {\usrtxt{#1}{}{name}[#2]}
```

`\cmdtxtargname` ... to do!

- `\cmdtxtargname{cmdName}`;
  `\cmdName[sub][sub][ext1]{arg}[ext2]` = $\text{cmdName}^{\text{SUB}}_{\text{SUB}}\text{ext1}(\text{arg})\text{ext2}$
- `\cmdtxtargname{cmdName}[newName]`;
  `\cmdName[sub][sub][ext1]{arg}[ext2]` = $\text{newName}^{\text{SUB}}_{\text{SUB}}\text{ext1}(\text{arg})\text{ext2}$

```
\newcommandx{\cmdtxtargname}[2][2=]
  {\usrtxt{#1}{}{argname}[#2]}
```

`\cmdtxtoargname` ... to do!

- `\cmdtxtoargname{cmdName}`;
  `\cmdName[sub][sub][arg]` = $\text{cmdName}^{\text{SUB}}_{\text{SUB}}(\text{arg})$
- `\cmdtxtoargname{cmdName}[newName]`;
  `\cmdName[sub][sub][arg]` = $\text{newName}^{\text{SUB}}_{\text{SUB}}(\text{arg})$

```
\newcommandx{\cmdtxtoargname}[2][2=]
  {\usrtxt{#1}{}{oargname}[#2]}
```

`\cmdtxtparname` ... to do!

- `\cmdtxtparname{cmdName}`;
  `\cmdName[sub][sub][ext1]{par}[ext2]` = $\text{cmdName}^{\text{SUB}}_{\text{SUB}}\text{ext1}[\text{par}]\text{ext2}$
- `\cmdtxtparname{cmdName}[newName]`;
  `\cmdName[sub][sub][ext1]{par}[ext2]` = $\text{newName}^{\text{SUB}}_{\text{SUB}}\text{ext1}[\text{par}]\text{ext2}$

```
\newcommandx{\cmdtxtparname}[2][2=]
  {\usrtxt{#1}{}{parname}[#2]}
```

`\cmdtxtoparname` ... to do!

- `\cmdtxtoparname{cmdName}`;
  `\cmdName[sub][sub][par]` = $\text{cmdName}^{\text{SUB}}_{\text{SUB}}[\text{par}]$
- `\cmdtxtoparname{cmdName}[newName]`;
  `\cmdName[sub][sub][par]` = $\text{newName}^{\text{SUB}}_{\text{SUB}}[\text{par}]$

```
\newcommandx{\cmdtxtoparname}[2][2=]
  {\usrtxt{#1}{}{oparname}[#2]}
```

\txtcom, ... to do!

- \txtcom{Name}[sub][sup][Ext] = $\textsc{Name}_{\textsc{sub}}^{\textsc{sup}}\textsc{Ext}$
- \txtargcom{Name}[sub][sup][Ext1]{Arg}[Ext2] = $\textsc{Name}_{\textsc{sub}}^{\textsc{sup}}\textsc{Ext1}(\textsc{Arg})\textsc{Ext2}$
- \txtparcom{Name}[sub][sup][Ext1]{Par}[Ext2] = $\textsc{Name}_{\textsc{sub}}^{\textsc{sup}}\textsc{Ext1}[\textsc{Par}]\textsc{Ext2}$

```
%% Style for Complexities
\cmdtxtall{com}\newcommand{\txtstycom}{\normalfont\mdseries\scshape\rmfamily}
```

\cmdtxtcom ... to do!

- \cmdtxtcom{cmdName};
  \cmdName[sub][sub][ext] = $\textsc{cmdName}_{\textsc{sub}}^{\textsc{sub}}\textsc{ext}$
- \cmdtxtcom{cmdName}[newName];
  \cmdName[sub][sub][ext] = $\textsc{newName}_{\textsc{sub}}^{\textsc{sub}}\textsc{ext}$

```
\newcommandx{\cmdtxtcom}[2][2=]
  {\usrtxt{#1}{}{com}[#2]}
```

\cmdtxtargcom ... to do!

- \cmdtxtargcom{cmdName};
  \cmdName[sub][sub][ext1]{arg}[ext2] = $\textsc{cmdName}_{\textsc{sub}}^{\textsc{sub}}\textsc{ext1}(\textsc{arg})\textsc{ext2}$
- \cmdtxtargcom{cmdName}[newName];
  \cmdName[sub][sub][ext1]{arg}[ext2] = $\textsc{newName}_{\textsc{sub}}^{\textsc{sub}}\textsc{ext1}(\textsc{arg})\textsc{ext2}$

```
\newcommandx{\cmdtxtargcom}[2][2=]
  {\usrtxt{#1}{}{argcom}[#2]}
```

\cmdtxtoargcom ... to do!

- \cmdtxtoargcom{cmdName};
  \cmdName[sub][sub][arg] = $\textsc{cmdName}_{\textsc{sub}}^{\textsc{sub}}(\textsc{arg})$
- \cmdtxtoargcom{cmdName}[newName];
  \cmdName[sub][sub][arg] = $\textsc{newName}_{\textsc{sub}}^{\textsc{sub}}(\textsc{arg})$

```
\newcommandx{\cmdtxtoargcom}[2][2=]
  {\usrtxt{#1}{}{oargcom}[#2]}
```

\cmdtxtparcom ... to do!

- \cmdtxtparcom{cmdName};
  \cmdName[sub][sub][ext1]{par}[ext2] = $\textsc{cmdName}_{\textsc{sub}}^{\textsc{sub}}\textsc{ext1}[\textsc{par}]\textsc{ext2}$
- \cmdtxtparcom{cmdName}[newName];
  \cmdName[sub][sub][ext1]{par}[ext2] = $\textsc{newName}_{\textsc{sub}}^{\textsc{sub}}\textsc{ext1}[\textsc{par}]\textsc{ext2}$

```
\newcommandx{\cmdtxtparcom}[2][2=]
  {\usrtxt{#1}{}{parcom}[#2]}
```

\cmdtxtoparcom ... to do!

- \cmdtxtoparcom{cmdName};
  \cmdName[sub][sub][par] = $\textsc{cmdName}_{\textsc{sub}}^{\textsc{sub}}[\textsc{par}]$
- \cmdtxtoparcom{cmdName}[newName];
  \cmdName[sub][sub][par] = $\textsc{newName}_{\textsc{sub}}^{\textsc{sub}}[\textsc{par}]$

```
\newcommandx{\cmdtxtoparcom}[2][2=]
  {\usrtxt{#1}{}{oparcom}[#2]}

\fi
%%*****************************************************************************%%
%%*****************************************************************************%%
%%** Math Macro Generators *****************************************************%%
%%*****************************************************************************%%
\ifmthgen@
```

\mthname, ... to do!

- \mthname{NAME}[sub][sup][Ext] = $\mathcal{NAME}_{sub}^{sup}Ext$
- \mthargname{NAME}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2] = $\mathcal{NAME}_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$

- `\mthargname*{NAME}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` $= \mathcal{NAME}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparname{NAME}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` $= \mathcal{NAME}^{sup}_{sub}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparname*{NAME}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` $= \mathcal{NAME}^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Names
\cmdmthall{name}\newcommand{\mthstyname}{\mathcal}
```

`\AName, ...` ... to do!
$\mathcal{A}$, $\mathcal{B}$, $\mathcal{C}$, $\mathcal{D}$, $\mathcal{E}$, $\mathcal{F}$, $\mathcal{G}$, $\mathcal{H}$, $\mathcal{I}$, $\mathcal{J}$, $\mathcal{K}$, $\mathcal{L}$, $\mathcal{M}$, $\mathcal{N}$, $\mathcal{O}$, $\mathcal{P}$, $\mathcal{Q}$, $\mathcal{R}$, $\mathcal{S}$, $\mathcal{T}$, $\mathcal{U}$, $\mathcal{V}$, $\mathcal{W}$, $\mathcal{X}$, $\mathcal{Y}$, $\mathcal{Z}$

```
\seqoflatupp{Name}{mthname}
```

`\cmdmthname` ... to do!

- `\cmdmthname{CMDNAME};`
  `\CMDNAMEName[sub][sub][ext]` $= \mathcal{CMDNAME}^{sub}_{sub}ext$
- `\cmdmthname{cmdName}[NEWNAME];`
  `\cmdNameName[sub][sub][ext]` $= \mathcal{NEWNAME}^{sub}_{sub}ext$

```
\newcommandx{\cmdmthname}[2][2=]
  {\usrmth{#1}{Name}{name}[#2]}
```

`\cmdmthargname` ... to do!

- `\cmdmthargname{CMDNAME};`
  `\CMDNAMEName[sub][sub][ext1]{arg}[ext2]` $= \mathcal{CMDNAME}^{sub}_{sub}ext1(arg)ext2$
- `\cmdmthargname{cmdName}[NEWNAME];`
  `\cmdNameName[sub][sub][ext1]{arg}[ext2]` $= \mathcal{NEWNAME}^{sub}_{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargname}[2][2=]
  {\usrmth{#1}{Name}{argname}[#2]}
```

`\cmdmthoargname` ... to do!

- `\cmdmthoargname{CMDNAME};`
  `\CMDNAMEName[sub][sub][arg]` $= \mathcal{CMDNAME}^{sub}_{sub}(arg)$
- `\cmdmthoargname{cmdName}[NEWNAME];`
  `\cmdNameName[sub][sub][arg]` $= \mathcal{NEWNAME}^{sub}_{sub}(arg)$

```
\newcommandx{\cmdmthoargname}[2][2=]
  {\usrmth{#1}{Name}{oargname}[#2]}
```

`\cmdmthparname` ... to do!

- `\cmdmthparname{CMDNAME};`
  `\CMDNAMEName[sub][sub][ext1]{par}[ext2]` $= \mathcal{CMDNAME}^{sub}_{sub}ext1[par]ext2$
- `\cmdmthparname{cmdName}[NEWNAME];`
  `\cmdNameName[sub][sub][ext1]{par}[ext2]` $= \mathcal{NEWNAME}^{sub}_{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparname}[2][2=]
  {\usrmth{#1}{Name}{parname}[#2]}
```

`\cmdmthoparname` ... to do!

- `\cmdmthoparname{CMDNAME};`
  `\CMDNAMEName[sub][sub][par]` $= \mathcal{CMDNAME}^{sub}_{sub}[par]$
- `\cmdmthoparname{cmdName}[NEWNAME];`
  `\cmdNameName[sub][sub][par]` $= \mathcal{NEWNAME}^{sub}_{sub}[par]$

```
\newcommandx{\cmdmthoparname}[2][2=]
  {\usrmth{#1}{Name}{oparname}[#2]}
```

`\mthfam, ...` ... to do!

- `\mthfam{NAME}[sub][sup][Ext]` $= \mathscr{NAME}^{sup}_{sub}Ext$
- `\mthargfam{NAME}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` $= \mathscr{NAME}^{sup}_{sub}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$
- `\mthargfam*{NAME}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` $= \mathscr{NAME}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparfam{NAME}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` $= \mathscr{NAME}^{sup}_{sub}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$

- `\mthparfam*{NAME}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` $= \mathscr{NAMME}^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Families
\cmdmthall{fam}\newcommand{\mthstyfam}{\mathscr}
```

`\AFam, ...` ... to do!

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

```
\seqoflatupp{Fam}{mthfam}
```

`\cmdmthfam` ... to do!

- `\cmdmthfam{CMDNAME};`
  `\CMDNAMEFam[sub][sub][ext]` $= \mathscr{CMDNAMME}^{sub}_{sub}ext$
- `\cmdmthfam{cmdName}[NEWNAME];`
  `\cmdNameFam[sub][sub][ext]` $= \mathscr{NEWNAMME}^{sub}_{sub}ext$

```
\newcommandx{\cmdmthfam}[2][2=]
  {\usrmth{#1}{Fam}{fam}[#2]}
```

`\cmdmthargfam` ... to do!

- `\cmdmthargfam{CMDNAME};`
  `\CMDNAMEFam[sub][sub][ext1]{arg}[ext2]` $= \mathscr{CMDNAMME}^{sub}_{sub}ext1(arg)ext2$
- `\cmdmthargfam{cmdName}[NEWNAME];`
  `\cmdNameFam[sub][sub][ext1]{arg}[ext2]` $= \mathscr{NEWNAMME}^{sub}_{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargfam}[2][2=]
  {\usrmth{#1}{Fam}{argfam}[#2]}
```

`\cmdmthoargfam` ... to do!

- `\cmdmthoargfam{CMDNAME};`
  `\CMDNAMEFam[sub][sub][arg]` $= \mathscr{CMDNAMME}^{sub}_{sub}(arg)$
- `\cmdmthoargfam{cmdFam}[NEWNAME];`
  `\cmdFamFam[sub][sub][arg]` $= \mathscr{NEWNAMME}^{sub}_{sub}(arg)$

```
\newcommandx{\cmdmthoargfam}[2][2=]
  {\usrmth{#1}{Fam}{oargfam}[#2]}
```

`\cmdmthparfam` ... to do!

- `\cmdmthparfam{CMDNAME};`
  `\CMDNAMEFam[sub][sub][ext1]{par}[ext2]` $= \mathscr{CMDNAMME}^{sub}_{sub}ext1[par]ext2$
- `\cmdmthparfam{cmdName}[NEWNAME];`
  `\cmdNameFam[sub][sub][ext1]{par}[ext2]` $= \mathscr{NEWNAMME}^{sub}_{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparfam}[2][2=]
  {\usrmth{#1}{Fam}{parfam}[#2]}
```

`\cmdmthoparfam` ... to do!

- `\cmdmthoparfam{CMDNAME};`
  `\CMDNAMEFam[sub][sub][par]` $= \mathscr{CMDNAMME}^{sub}_{sub}[par]$
- `\cmdmthoparfam{cmdFam}[NEWNAME];`
  `\cmdFamFam[sub][sub][par]` $= \mathscr{NEWNAMME}^{sub}_{sub}[par]$

```
\newcommandx{\cmdmthoparfam}[2][2=]
  {\usrmth{#1}{Fam}{oparfam}[#2]}
```

`\mthcls, ...` ... to do!

- `\mthcls{NAME}[sub][sup][Ext]` $= \mathcal{NAME}^{sup}_{sub}Ext$
- `\mthargcls{NAME}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` $= \mathcal{NAME}^{sup}_{sub}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$
- `\mthargcls*{NAME}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` $= \mathcal{NAME}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparcls{NAME}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` $= \mathcal{NAME}^{sup}_{sub}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparcls*{NAME}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` $= \mathcal{NAME}^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Classes
\cmdmthall{cls}\newcommand{\mthstycls}{\matheus}
```

`\ACls, ...` ... to do!

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

```
\seqoflatupp{Cls}{mthcls}
```

`\cmdmthcls` ... to do!

- `\cmdmthcls{CMDNAME}`;
  `\CMDNAMECls[sub][sub][ext]` = $\mathcal{CMDNAME}^{sub}_{sub}ext$
- `\cmdmthcls{cmdName}[NEWNAME]`;
  `\cmdNameCls[sub][sub][ext]` = $\mathcal{NEWNAME}^{sub}_{sub}ext$

```
\newcommandx{\cmdmthcls}[2][2=]
  {\usrmth{#1}{Cls}{cls}[#2]}
```

`\cmdmthargcls` ... to do!

- `\cmdmthargcls{CMDNAME}`;
  `\CMDNAMECls[sub][sub][ext1]{arg}[ext2]` = $\mathcal{CMDNAME}^{sub}_{sub}ext1(arg)ext2$
- `\cmdmthargcls{cmdName}[NEWNAME]`;
  `\cmdNameCls[sub][sub][ext1]{arg}[ext2]` = $\mathcal{NEWNAME}^{sub}_{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargcls}[2][2=]
  {\usrmth{#1}{Cls}{argcls}[#2]}
```

`\cmdmthoargcls` ... to do!

- `\cmdmthoargcls{CMDNAME}`;
  `\CMDNAMECls[sub][sub][arg]` = $\mathcal{CMDNAME}^{sub}_{sub}(arg)$
- `\cmdmthoargcls{cmdCls}[NEWNAME]`;
  `\cmdClsCls[sub][sub][arg]` = $\mathcal{NEWNAME}^{sub}_{sub}(arg)$

```
\newcommandx{\cmdmthoargcls}[2][2=]
  {\usrmth{#1}{Cls}{oargcls}[#2]}
```

`\cmdmthparcls` ... to do!

- `\cmdmthparcls{CMDNAME}`;
  `\CMDNAMECls[sub][sub][ext1]{par}[ext2]` = $\mathcal{CMDNAME}^{sub}_{sub}ext1[par]ext2$
- `\cmdmthparcls{cmdName}[NEWNAME]`;
  `\cmdNameCls[sub][sub][ext1]{par}[ext2]` = $\mathcal{NEWNAME}^{sub}_{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparcls}[2][2=]
  {\usrmth{#1}{Cls}{parcls}[#2]}
```

`\cmdmthoparcls` ... to do!

- `\cmdmthoparcls{CMDNAME}`;
  `\CMDNAMECls[sub][sub][par]` = $\mathcal{CMDNAME}^{sub}_{sub}[par]$
- `\cmdmthoparcls{cmdCls}[NEWNAME]`;
  `\cmdClsCls[sub][sub][par]` = $\mathcal{NEWNAME}^{sub}_{sub}[par]$

```
\newcommandx{\cmdmthoparcls}[2][2=]
  {\usrmth{#1}{Cls}{oparcls}[#2]}
```

`\mthsig, ...` ... to do!

- `\mthsig{Name}[sub][sup][Ext]` = $\mathit{Name}^{sup}_{sub}Ext$
- `\mthargsig{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\mathit{Name}^{sup}_{sub}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$
- `\mthargsig*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\mathit{Name}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparsig{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\mathit{Name}^{sup}_{sub}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparsig*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\mathit{Name}^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Signatures
\cmdmthall{sig}\newcommand{\mthstysig}{\mathpzc}
```

`\aSig, ...` ... to do!

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
$\mathcal{A}$, $\mathcal{B}$, $\mathcal{C}$, $\mathcal{D}$, $\mathcal{E}$, $\mathcal{F}$, $\mathcal{G}$, $\mathcal{H}$, $\mathcal{I}$, $\mathcal{J}$, $\mathcal{K}$, $\mathcal{L}$, $\mathcal{M}$, $\mathcal{N}$, $\mathcal{O}$, $\mathcal{P}$, $\mathcal{Q}$, $\mathcal{R}$, $\mathcal{S}$, $\mathcal{T}$, $\mathcal{U}$, $\mathcal{V}$, $\mathcal{W}$, $\mathcal{X}$, $\mathcal{Y}$, $\mathcal{Z}$
α, β, γ, δ, ϵ, ε, ζ, η, θ, ϑ, ι, κ, $\varkappa$, λ, μ, ν, ξ, o, π, ϖ, ρ, ϱ, σ, ς, τ, υ, ϕ, φ, χ, ψ, ω

```
\seqoflatlet{Sig}{mthsig}\seqofgrklow{Sig}{mthsig}
```

`\cmdmthsig` ... to do!

- `\cmdmthsig{cmdName}`;
  `\cmdNameSig[sub][sub][ext]` = $\mathit{cmdName}^{sub}_{sub}ext$
- `\cmdmthsig{cmdName}[NewName]`;
  `\cmdNameSig[sub][sub][ext]` = $\mathcal{NewName}^{sub}_{sub}ext$

```
\newcommandx{\cmdmthsig}[2][2=]
  {\usrmth{#1}{Sig}{sig}[#2]}
```

`\cmdmthargsig` ... to do!

- `\cmdmthargsig{cmdName}`;
  `\cmdNameSig[sub][sub][ext1]{arg}[ext2]` = $\mathit{cmdName}^{sub}_{sub}ext1(arg)ext2$
- `\cmdmthargsig{cmdName}[NewName]`;
  `\cmdNameSig[sub][sub][ext1]{arg}[ext2]` = $\mathcal{NewName}^{sub}_{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargsig}[2][2=]
  {\usrmth{#1}{Sig}{argsig}[#2]}
```

`\cmdmthoargsig` ... to do!

- `\cmdmthoargsig{cmdName}`;
  `\cmdNameSig[sub][sub][arg]` = $\mathit{cmdName}^{sub}_{sub}(arg)$
- `\cmdmthoargsig{cmdSig}[NewName]`;
  `\cmdSigSig[sub][sub][arg]` = $\mathcal{NewName}^{sub}_{sub}(arg)$

```
\newcommandx{\cmdmthoargsig}[2][2=]
  {\usrmth{#1}{Sig}{oargsig}[#2]}
```

`\cmdmthparsig` ... to do!

- `\cmdmthparsig{cmdName}`;
  `\cmdNameSig[sub][sub][ext1]{par}[ext2]` = $\mathit{cmdName}^{sub}_{sub}ext1[par]ext2$
- `\cmdmthparsig{cmdName}[NewName]`;
  `\cmdNameSig[sub][sub][ext1]{par}[ext2]` = $\mathcal{NewName}^{sub}_{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparsig}[2][2=]
  {\usrmth{#1}{Sig}{parsig}[#2]}
```

`\cmdmthoparsig` ... to do!

- `\cmdmthoparsig{cmdName}`;
  `\cmdNameSig[sub][sub][par]` = $\mathit{cmdName}^{sub}_{sub}[par]$
- `\cmdmthoparsig{cmdSig}[NewName]`;
  `\cmdSigSig[sub][sub][par]` = $\mathcal{NewName}^{sub}_{sub}[par]$

```
\newcommandx{\cmdmthoparsig}[2][2=]
  {\usrmth{#1}{Sig}{oparsig}[#2]}
```

`\mthstr, ...` ... to do!

- `\mthstr{Name}[sub][sup][Ext]` = $\mathfrak{Name}^{sup}_{sub}Ext$
- `\mthargstr{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\mathfrak{Name}^{sup}_{sub}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$
- `\mthargstr*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\mathfrak{Name}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparstr{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\mathfrak{Name}^{sup}_{sub}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparstr*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\mathfrak{Name}^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Structures
\cmdmthall{str}\newcommand{\mthstystr}{\mathfrak}
```

`\aStr, ...` ... to do!

$\mathfrak{a}$, $\mathfrak{b}$, $\mathfrak{c}$, $\mathfrak{d}$, $\mathfrak{e}$, $\mathfrak{f}$, $\mathfrak{g}$, $\mathfrak{h}$, $\mathfrak{i}$, $\mathfrak{j}$, $\mathfrak{k}$, $\mathfrak{l}$, $\mathfrak{m}$, $\mathfrak{n}$, $\mathfrak{o}$, $\mathfrak{p}$, $\mathfrak{q}$, $\mathfrak{r}$, $\mathfrak{s}$, $\mathfrak{t}$, $\mathfrak{u}$, $\mathfrak{v}$, $\mathfrak{w}$, $\mathfrak{x}$, $\mathfrak{y}$, $\mathfrak{z}$
$\mathfrak{A}$, $\mathfrak{B}$, $\mathfrak{C}$, $\mathfrak{D}$, $\mathfrak{E}$, $\mathfrak{F}$, $\mathfrak{G}$, $\mathfrak{H}$, $\mathfrak{I}$, $\mathfrak{J}$, $\mathfrak{K}$, $\mathfrak{L}$, $\mathfrak{M}$, $\mathfrak{N}$, $\mathfrak{O}$, $\mathfrak{P}$, $\mathfrak{Q}$, $\mathfrak{R}$, $\mathfrak{S}$, $\mathfrak{T}$, $\mathfrak{U}$, $\mathfrak{V}$, $\mathfrak{W}$, $\mathfrak{X}$, $\mathfrak{Y}$, $\mathfrak{Z}$
α, β, γ, δ, ϵ, ε, ζ, η, θ, ϑ, ι, κ, $\varkappa$, λ, μ, ν, ξ, $\mathfrak{o}$, π, ϖ, ρ, ϱ, σ, ς, τ, υ, ϕ, φ, χ, ψ, ω

```
\seqoflatlet{Str}{mthstr}\seqofgrklow{Str}{mthstr}
```

`\cmdmthstr` ... to do!

- `\cmdmthstr{cmdName}`;
  `\cmdNameStr[sub][sub][ext]` = $\mathfrak{cmdName}^{sub}_{sub}ext$
- `\cmdmthstr{cmdName}[NewName]`;
  `\cmdNameStr[sub][sub][ext]` = $\mathfrak{NewName}^{sub}_{sub}ext$

```
\newcommandx{\cmdmthstr}[2][2=]
  {\usrmth{#1}{Str}{str}[#2]}
```

`\cmdmthargstr` ... to do!

- `\cmdmthargstr{cmdName}`;
  `\cmdNameStr[sub][sub][ext1]{arg}[ext2]` = $\mathfrak{cmdName}^{sub}_{sub}ext1(arg)ext2$
- `\cmdmthargstr{cmdName}[NewName]`;
  `\cmdNameStr[sub][sub][ext1]{arg}[ext2]` = $\mathfrak{NewName}^{sub}_{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargstr}[2][2=]
  {\usrmth{#1}{Str}{argstr}[#2]}
```

`\cmdmthoargstr` ... to do!

- `\cmdmthoargstr{cmdName}`;
  `\cmdNameStr[sub][sub][arg]` = $\mathfrak{cmdName}^{sub}_{sub}(arg)$
- `\cmdmthoargstr{cmdStr}[NewName]`;
  `\cmdStrStr[sub][sub][arg]` = $\mathfrak{NewName}^{sub}_{sub}(arg)$

```
\newcommandx{\cmdmthoargstr}[2][2=]
  {\usrmth{#1}{Str}{oargstr}[#2]}
```

`\cmdmthparstr` ... to do!

- `\cmdmthparstr{cmdName}`;
  `\cmdNameStr[sub][sub][ext1]{par}[ext2]` = $\mathfrak{cmdName}^{sub}_{sub}ext1[par]ext2$
- `\cmdmthparstr{cmdName}[NewName]`;
  `\cmdNameStr[sub][sub][ext1]{par}[ext2]` = $\mathfrak{NewName}^{sub}_{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparstr}[2][2=]
  {\usrmth{#1}{Str}{parstr}[#2]}
```

`\cmdmthoparstr` ... to do!

- `\cmdmthoparstr{cmdName}`;
  `\cmdNameStr[sub][sub][par]` = $\mathfrak{cmdName}^{sub}_{sub}[par]$
- `\cmdmthoparstr{cmdStr}[NewName]`;
  `\cmdStrStr[sub][sub][par]` = $\mathfrak{NewName}^{sub}_{sub}[par]$

```
\newcommandx{\cmdmthoparstr}[2][2=]
  {\usrmth{#1}{Str}{oparstr}[#2]}
```

`\mthset, ...` ... to do!

- `\mthset{Name}[sub][sup][Ext]` = $\mathrm{Name}^{sup}_{sub}Ext$
- `\mthargset{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\mathrm{Name}^{sup}_{sub}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$
- `\mthargset*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\mathrm{Name}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparset{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\mathrm{Name}^{sup}_{sub}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparset*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\mathrm{Name}^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Sets
\cmdmthall{set}\newcommand{\mthstyset}{\mathrm}
```

`\aSet, ...` ... to do!

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
α, β, γ, δ, ϵ, ε, ζ, η, θ, ϑ, ι, κ, $\varkappa$, λ, μ, ν, ξ, o, π, ϖ, ρ, ϱ, σ, ς, τ, υ, ϕ, φ, χ, ψ, ω
A, B, Γ, Δ, E, E, Z, H, Θ, $\varTheta$, I, K, K, Λ, M, N, Ξ, O, Π, $\varPi$, P, P, Σ, $\varSigma$, T, Υ, Φ, $\varPhi$, X, Ψ, Ω

```
\seqoflet{Set}{mthset}
```

`\cmdmthset` ... to do!

- `\cmdmthset{cmdName}`;
  `\cmdNameSet[sub][sub][ext]` = $\text{cmdName}_{sub}^{sub}ext$
- `\cmdmthset{cmdName}[NewName]`;
  `\cmdNameSet[sub][sub][ext]` = $\text{NewName}_{sub}^{sub}ext$

```
\newcommandx{\cmdmthset}[2][2=]
  {\usrmth{#1}{Set}{set}[#2]}
```

`\cmdmthargset` ... to do!

- `\cmdmthargset{cmdName}`;
  `\cmdNameSet[sub][sub][ext1]{arg}[ext2]` = $\text{cmdName}_{sub}^{sub}ext1(arg)ext2$
- `\cmdmthargset{cmdName}[NewName]`;
  `\cmdNameSet[sub][sub][ext1]{arg}[ext2]` = $\text{NewName}_{sub}^{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargset}[2][2=]
  {\usrmth{#1}{Set}{argset}[#2]}
```

`\cmdmthoargset` ... to do!

- `\cmdmthoargset{cmdName}`;
  `\cmdNameSet[sub][sub][arg]` = $\text{cmdName}_{sub}^{sub}(arg)$
- `\cmdmthoargset{cmdSet}[NewName]`;
  `\cmdSetSet[sub][sub][arg]` = $\text{NewName}_{sub}^{sub}(arg)$

```
\newcommandx{\cmdmthoargset}[2][2=]
  {\usrmth{#1}{Set}{oargset}[#2]}
```

`\cmdmthparset` ... to do!

- `\cmdmthparset{cmdName}`;
  `\cmdNameSet[sub][sub][ext1]{par}[ext2]` = $\text{cmdName}_{sub}^{sub}ext1[par]ext2$
- `\cmdmthparset{cmdName}[NewName]`;
  `\cmdNameSet[sub][sub][ext1]{par}[ext2]` = $\text{NewName}_{sub}^{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparset}[2][2=]
  {\usrmth{#1}{Set}{parset}[#2]}
```

`\cmdmthoparset` ... to do!

- `\cmdmthoparset{cmdName}`;
  `\cmdNameSet[sub][sub][par]` = $\text{cmdName}_{sub}^{sub}[par]$
- `\cmdmthoparset{cmdSet}[NewName]`;
  `\cmdSetSet[sub][sub][par]` = $\text{NewName}_{sub}^{sub}[par]$

```
\newcommandx{\cmdmthoparset}[2][2=]
  {\usrmth{#1}{Set}{oparset}[#2]}
```

`\cmdmthsetext` ... to do!

```
\newcommandx{\cmdmthsetext}[3][2=, 3=]
  {\cmdmthset{#1}[#2]\caselower[q]{#1}%
  \usrmthlet{\thestring}{Sym}{sym}
    [\defval{#3}{\defval{\empchk{#2}{\lowercase{#2}}}{\thestring}}]%
  \usrmthlet{\thestring}{Elm}{elm}
    [\defval{#3}{\defval{\empchk{#2}{\lowercase{#2}}}{\thestring}}]}
```

`\mthrel, ...` ... to do!

- `\mthrel{Name}[sub][sup][Ext]` = $Name_{sub}^{sup}Ext$
- `\mthargrel{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $Name_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$

- `\mthargrel*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $Name_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparrel{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $Name_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparrel*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $Name_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Relations
\cmdmthall{rel}\newcommand{\mthstyrel}{\mathit}
```

`\aRel, ...` ... to do!

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, L, T, U, V, W, X, Y, Z
α, β, γ, δ, ϵ, ε, ζ, η, θ, ϑ, ι, κ, $\varkappa$, λ, μ, ν, ξ, o, π, ϖ, ρ, ϱ, σ, ς, τ, υ, ϕ, φ, χ, ψ, ω
A, B, Γ, Δ, E, E, Z, H, Θ, Θ, I, K, K, Λ, M, N, Ξ, O, Π, Π, P, P, Σ, Σ, T, Υ, Φ, Φ, X, Ψ, Ω

```
\seqoflet{Rel}{mthrel}
```

`\cmdmthrel` ... to do!

- `\cmdmthrel{cmdName}`;
  `\cmdNameRel[sub][sub][ext]` = $cmdName_{sub}^{sub}ext$
- `\cmdmthrel{cmdName}[NewName]`;
  `\cmdNameRel[sub][sub][ext]` = $NewName_{sub}^{sub}ext$

```
\newcommandx{\cmdmthrel}[2][2=]
  {\usrmth{#1}{Rel}{rel}[#2]}
```

`\cmdmthargrel` ... to do!

- `\cmdmthargrel{cmdName}`;
  `\cmdNameRel[sub][sub][ext1]{arg}[ext2]` = $cmdName_{sub}^{sub}ext1(arg)ext2$
- `\cmdmthargrel{cmdName}[NewName]`;
  `\cmdNameRel[sub][sub][ext1]{arg}[ext2]` = $NewName_{sub}^{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargrel}[2][2=]
  {\usrmth{#1}{Rel}{argrel}[#2]}
```

`\cmdmthoargrel` ... to do!

- `\cmdmthoargrel{cmdName}`;
  `\cmdNameRel[sub][sub][arg]` = $cmdName_{sub}^{sub}(arg)$
- `\cmdmthoargrel{cmdRel}[NewName]`;
  `\cmdRelRel[sub][sub][arg]` = $NewName_{sub}^{sub}(arg)$

```
\newcommandx{\cmdmthoargrel}[2][2=]
  {\usrmth{#1}{Rel}{oargrel}[#2]}
```

`\cmdmthparrel` ... to do!

- `\cmdmthparrel{cmdName}`;
  `\cmdNameRel[sub][sub][ext1]{par}[ext2]` = $cmdName_{sub}^{sub}ext1[par]ext2$
- `\cmdmthparrel{cmdName}[NewName]`;
  `\cmdNameRel[sub][sub][ext1]{par}[ext2]` = $NewName_{sub}^{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparrel}[2][2=]
  {\usrmth{#1}{Rel}{parrel}[#2]}
```

`\cmdmthoparrel` ... to do!

- `\cmdmthoparrel{cmdName}`;
  `\cmdNameRel[sub][sub][par]` = $cmdName_{sub}^{sub}[par]$
- `\cmdmthoparrel{cmdRel}[NewName]`;
  `\cmdRelRel[sub][sub][par]` = $NewName_{sub}^{sub}[par]$

```
\newcommandx{\cmdmthoparrel}[2][2=]
  {\usrmth{#1}{Rel}{oparrel}[#2]}
```

`\mthfun, ...` ... to do!

- `\mthfun{Name}[sub][sup][Ext]` = $\mathsf{Name}_{sub}^{sup}Ext$
- `\mthargfun{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\mathsf{Name}_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$

- `\mthargfun*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\mathsf{Name}_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparfun{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\mathsf{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparfun*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\mathsf{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Functions
\cmdmthall{fun}\newcommand{\mthstyfun}{\mathsf}
```

`\aFun, ...` ... to do!

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
α, β, γ, δ, ϵ, ε, ζ, η, θ, ϑ, ι, κ, $\varkappa$, λ, μ, ν, ξ, o, π, ϖ, ρ, ϱ, σ, ς, τ, υ, ϕ, φ, χ, ψ, ω
A, B, Γ, Δ, E, E, Z, H, Θ, $\varTheta$, I, K, K, Λ, M, N, Ξ, O, Π, $\varPi$, P, P, Σ, $\varSigma$, T, Υ, Φ, $\varPhi$, X, Ψ, Ω

```
\seqoflet{Fun}{mthfun}
```

`\cmdmthfun` ... to do!

- `\cmdmthfun{cmdName}`;
  `\cmdNameFun[sub][sub][ext]` = $\mathsf{cmdName}_{sub}^{sub}ext$
- `\cmdmthfun{cmdName}[NewName]`;
  `\cmdNameFun[sub][sub][ext]` = $\mathsf{NewName}_{sub}^{sub}ext$

```
\newcommandx{\cmdmthfun}[2][2=]
  {\usrmth{#1}{Fun}{fun}[#2]}
```

`\cmdmthargfun` ... to do!

- `\cmdmthargfun{cmdName}`;
  `\cmdNameFun[sub][sub][ext1]{arg}[ext2]` = $\mathsf{cmdName}_{sub}^{sub}ext1(arg)ext2$
- `\cmdmthargfun{cmdName}[NewName]`;
  `\cmdNameFun[sub][sub][ext1]{arg}[ext2]` = $\mathsf{NewName}_{sub}^{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargfun}[2][2=]
  {\usrmth{#1}{Fun}{argfun}[#2]}
```

`\cmdmthoargfun` ... to do!

- `\cmdmthoargfun{cmdName}`;
  `\cmdNameFun[sub][sub][arg]` = $\mathsf{cmdName}_{sub}^{sub}(arg)$
- `\cmdmthoargfun{cmdFun}[NewName]`;
  `\cmdFunFun[sub][sub][arg]` = $\mathsf{NewName}_{sub}^{sub}(arg)$

```
\newcommandx{\cmdmthoargfun}[2][2=]
  {\usrmth{#1}{Fun}{oargfun}[#2]}
```

`\cmdmthparfun` ... to do!

- `\cmdmthparfun{cmdName}`;
  `\cmdNameFun[sub][sub][ext1]{par}[ext2]` = $\mathsf{cmdName}_{sub}^{sub}ext1[par]ext2$
- `\cmdmthparfun{cmdName}[NewName]`;
  `\cmdNameFun[sub][sub][ext1]{par}[ext2]` = $\mathsf{NewName}_{sub}^{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparfun}[2][2=]
  {\usrmth{#1}{Fun}{parfun}[#2]}
```

`\cmdmthoparfun` ... to do!

- `\cmdmthoparfun{cmdName}`;
  `\cmdNameFun[sub][sub][par]` = $\mathsf{cmdName}_{sub}^{sub}[par]$
- `\cmdmthoparfun{cmdFun}[NewName]`;
  `\cmdFunFun[sub][sub][par]` = $\mathsf{NewName}_{sub}^{sub}[par]$

```
\newcommandx{\cmdmthoparfun}[2][2=]
  {\usrmth{#1}{Fun}{oparfun}[#2]}
```

`\mthsym, ...` ... to do!

- `\mthsym{Name}[sub][sup][Ext]` = $\mathtt{Name}_{sub}^{sup}Ext$
- `\mthargsym{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\mathtt{Name}_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$

- `\mthargsym*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparsym{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparsym*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\texttt{Name}_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Symbols
\cmdmthall{sym}\newcommand{\mthstysym}{\mathtt}
```

`\aSym, ...` ... to do!

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
α, β, γ, δ, ϵ, ε, ζ, η, θ, ϑ, ι, κ, $\varkappa$, λ, μ, ν, ξ, o, π, ϖ, ρ, ϱ, σ, ς, τ, υ, ϕ, φ, χ, ψ, ω
A, B, Γ, Δ, E, E, Z, H, Θ, $\mathit{\Theta}$, I, K, K, Λ, M, N, Ξ, O, Π, $\mathit{\Pi}$, P, P, Σ, $\mathit{\Sigma}$, T, Υ, Φ, $\mathit{\Phi}$, X, Ψ, Ω

```
\seqoflet{Sym}{mthsym}
```

`\cmdmthsym` ... to do!

- `\cmdmthsym{cmdName}`;
  `\cmdNameSym[sub][sub][ext]` = $\texttt{cmdName}_{sub}^{sub}ext$
- `\cmdmthsym{cmdName}[NewName]`;
  `\cmdNameSym[sub][sub][ext]` = $\texttt{NewName}_{sub}^{sub}ext$

```
\newcommandx{\cmdmthsym}[2][2=]
  {\usrmth{#1}{Sym}{sym}[#2]}
```

`\cmdmthargsym` ... to do!

- `\cmdmthargsym{cmdName}`;
  `\cmdNameSym[sub][sub][ext1]{arg}[ext2]` = $\texttt{cmdName}_{sub}^{sub}ext1(arg)ext2$
- `\cmdmthargsym{cmdName}[NewName]`;
  `\cmdNameSym[sub][sub][ext1]{arg}[ext2]` = $\texttt{NewName}_{sub}^{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargsym}[2][2=]
  {\usrmth{#1}{Sym}{argsym}[#2]}
```

`\cmdmthoargsym` ... to do!

- `\cmdmthoargsym{cmdName}`;
  `\cmdNameSym[sub][sub][arg]` = $\texttt{cmdName}_{sub}^{sub}(arg)$
- `\cmdmthoargsym{cmdSym}[NewName]`;
  `\cmdSymSym[sub][sub][arg]` = $\texttt{NewName}_{sub}^{sub}(arg)$

```
\newcommandx{\cmdmthoargsym}[2][2=]
  {\usrmth{#1}{Sym}{oargsym}[#2]}
```

`\cmdmthparsym` ... to do!

- `\cmdmthparsym{cmdName}`;
  `\cmdNameSym[sub][sub][ext1]{par}[ext2]` = $\texttt{cmdName}_{sub}^{sub}ext1[par]ext2$
- `\cmdmthparsym{cmdName}[NewName]`;
  `\cmdNameSym[sub][sub][ext1]{par}[ext2]` = $\texttt{NewName}_{sub}^{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparsym}[2][2=]
  {\usrmth{#1}{Sym}{parsym}[#2]}
```

`\cmdmthoparsym` ... to do!

- `\cmdmthoparsym{cmdName}`;
  `\cmdNameSym[sub][sub][par]` = $\texttt{cmdName}_{sub}^{sub}[par]$
- `\cmdmthoparsym{cmdSym}[NewName]`;
  `\cmdSymSym[sub][sub][par]` = $\texttt{NewName}_{sub}^{sub}[par]$

```
\newcommandx{\cmdmthoparsym}[2][2=]
  {\usrmth{#1}{Sym}{oparsym}[#2]}
```

`\mthelm, ...` ... to do!

- `\mthelm{Name}[sub][sup][Ext]` = $Name_{sub}^{sup}Ext$
- `\mthargelm{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $Name_{sub}^{sup}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$

- `\mthargelm*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $Name_{sub}^{sup}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparelm{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $Name_{sub}^{sup}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparelm*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $Name_{sub}^{sup}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Elements
\cmdmthall{elm}\newcommand{\mthstyelm}{\mathnormal}
```

`\aElm, ...` ... to do!

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
α, β, γ, δ, ϵ, ε, ζ, η, θ, ϑ, ι, κ, $\varkappa$, λ, μ, ν, ξ, o, π, ϖ, ρ, ϱ, σ, ς, τ, υ, ϕ, φ, χ, ψ, ω
A, B, Γ, Δ, E, E, Z, H, Θ, Θ, I, K, K, Λ, M, N, Ξ, O, Π, Π, P, P, Σ, Σ, T, Υ, Φ, Φ, X, Ψ, Ω

```
\seqoflet{Elm}{mthelm}
```

`\cmdmthelm` ... to do!

- `\cmdmthelm{cmdName}`;
  `\cmdNameElm[sub][sub][ext]` = $cmdName_{sub}^{sub}ext$
- `\cmdmthelm{cmdName}[NewName]`;
  `\cmdNameElm[sub][sub][ext]` = $NewName_{sub}^{sub}ext$

```
\newcommandx{\cmdmthelm}[2][2=]
  {\usrmth{#1}{Elm}{elm}[#2]}
```

`\cmdmthargelm` ... to do!

- `\cmdmthargelm{cmdName}`;
  `\cmdNameElm[sub][sub][ext1]{arg}[ext2]` = $cmdName_{sub}^{sub}ext1(arg)ext2$
- `\cmdmthargelm{cmdName}[NewName]`;
  `\cmdNameElm[sub][sub][ext1]{arg}[ext2]` = $NewName_{sub}^{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargelm}[2][2=]
  {\usrmth{#1}{Elm}{argelm}[#2]}
```

`\cmdmthoargelm` ... to do!

- `\cmdmthoargelm{cmdName}`;
  `\cmdNameElm[sub][sub][arg]` = $cmdName_{sub}^{sub}(arg)$
- `\cmdmthoargelm{cmdElm}[NewName]`;
  `\cmdElmElm[sub][sub][arg]` = $NewName_{sub}^{sub}(arg)$

```
\newcommandx{\cmdmthoargelm}[2][2=]
  {\usrmth{#1}{Elm}{oargelm}[#2]}
```

`\cmdmthparelm` ... to do!

- `\cmdmthparelm{cmdName}`;
  `\cmdNameElm[sub][sub][ext1]{par}[ext2]` = $cmdName_{sub}^{sub}ext1[par]ext2$
- `\cmdmthparelm{cmdName}[NewName]`;
  `\cmdNameElm[sub][sub][ext1]{par}[ext2]` = $NewName_{sub}^{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparelm}[2][2=]
  {\usrmth{#1}{Elm}{parelm}[#2]}
```

`\cmdmthoparelm` ... to do!

- `\cmdmthoparelm{cmdName}`;
  `\cmdNameElm[sub][sub][par]` = $cmdName_{sub}^{sub}[par]$
- `\cmdmthoparelm{cmdElm}[NewName]`;
  `\cmdElmElm[sub][sub][par]` = $NewName_{sub}^{sub}[par]$

```
\newcommandx{\cmdmthoparelm}[2][2=]
  {\usrmth{#1}{Elm}{oparelm}[#2]}

%%*************************************************************************%%
```

`\cmdmthsymelm` ... to do!

- \cmdmthsymelm{cmdName};
  \cmdNameSym[sub][sub][ext] = cmdName$_{sub}^{sub}ext$
  \cmdNameElm[sub][sub][ext] = $cmdName_{sub}^{sub}ext$
- \cmdmthsymelm{cmdName}[NewName];
  \cmdNameSym[sub][sub][ext] = NewName$_{sub}^{sub}ext$
  \cmdNameElm[sub][sub][ext] = $NewName_{sub}^{sub}ext$

```
\newcommandx{\cmdmthsymelm}[2][2=]
  {\cmdmthsym{#1}[#2]%
   \cmdmthelm{#1}[#2]}
```

\cmdmthargsymelm ... to do!

- \cmdmthargsymelm{cmdName};
  \cmdNameSym[sub][sub][ext1]{arg}[ext2] = cmdName$_{sub}^{sub}ext1(arg)ext2$
  \cmdNameElm[sub][sub][ext1]{arg}[ext2] = $cmdName_{sub}^{sub}ext1(arg)ext2$
- \cmdmthargsymelm{cmdName}[NewName];
  \cmdNameSym[sub][sub][ext1]{arg}[ext2] = NewName$_{sub}^{sub}ext1(arg)ext2$
  \cmdNameElm[sub][sub][ext1]{arg}[ext2] = $NewName_{sub}^{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargsymelm}[2][2=]
  {\cmdmthargsym{#1}[#2]%
   \cmdmthargelm{#1}[#2]}
```

\cmdmthoargsymelm ... to do!

- \cmdmthoargsymelm{cmdName};
  \cmdNameSym[sub][sub][arg] = cmdName$_{sub}^{sub}(arg)$
  \cmdNameElm[sub][sub][arg] = $cmdName_{sub}^{sub}(arg)$
- \cmdmthoargsymelm{cmdName}[NewName];
  \cmdNameSym[sub][sub][arg] = NewName$_{sub}^{sub}(arg)$
  \cmdNameElm[sub][sub][arg] = $NewName_{sub}^{sub}(arg)$

```
\newcommandx{\cmdmthoargsymelm}[2][2=]
  {\cmdmthoargsym{#1}[#2]%
   \cmdmthoargelm{#1}[#2]}
```

\cmdmthparsymelm ... to do!

- \cmdmthparsymelm{cmdName};
  \cmdNameSym[sub][sub][ext1]{par}[ext2] = cmdName$_{sub}^{sub}ext1[par]ext2$
  \cmdNameElm[sub][sub][ext1]{par}[ext2] = $cmdName_{sub}^{sub}ext1[par]ext2$
- \cmdmthparsymelm{cmdName}[NewName];
  \cmdNameSym[sub][sub][ext1]{par}[ext2] = NewName$_{sub}^{sub}ext1[par]ext2$
  \cmdNameElm[sub][sub][ext1]{par}[ext2] = $NewName_{sub}^{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparsymelm}[2][2=]
  {\cmdmthparsym{#1}[#2]%
   \cmdmthparelm{#1}[#2]}
```

\cmdmthoparsymelm ... to do!

- \cmdmthoparsymelm{cmdName};
  \cmdNameSym[sub][sub][par] = cmdName$_{sub}^{sub}[par]$
  \cmdNameElm[sub][sub][par] = $cmdName_{sub}^{sub}[par]$
- \cmdmthoparsymelm{cmdName}[NewName];
  \cmdNameSym[sub][sub][par] = NewName$_{sub}^{sub}[par]$
  \cmdNameElm[sub][sub][par] = $NewName_{sub}^{sub}[par]$

```
\newcommandx{\cmdmthoparsymelm}[2][2=]
  {\cmdmthoparsym{#1}[#2]%
   \cmdmthoparelm{#1}[#2]}

%%*************************************************************************%%
```

\mthluop, ... to do!

- \mthluop{\oplus}[sub][sup][Ext] = $\oplus_{sub}^{sup} Ext$
- \mthlbop{\oplus}[sub][sup][Ext] = $\oplus_{sub}^{sup} Ext$

```
%% Style for \LaTex Operators
\cmdmth{luop}\newcommand{\mthstyluop}[1]{\textstyle\mathop{#1}}
\cmdmth{lbop}\newcommand{\mthstylbop}[1]{\textstyle\mathbin{#1}}
```

`\cmdmthluop, ...` ... to do!

- `\cmdmthluop{cmdName};`
  `\cmdNameUOp[sub][sub][ext]` $= cmdName^{sub}_{sub}\,ext$
- `\cmdmthluop{cmdName}[\oplus];`
  `\cmdNameUOp[sub][sub][ext]` $= \oplus^{sub}_{sub}\,ext$
- `\cmdmthlbop{cmdName};`
  `\cmdNameBOp[sub][sub][ext]` $= cmdName^{sub}_{sub}ext$
- `\cmdmthlbop{cmdName}[\oplus];`
  `\cmdNameBOp[sub][sub][ext]` $= \oplus^{sub}_{sub}ext$

```
\newcommandx{\cmdmthluop}[2][2=]
  {\usrmth{#1}{UOp}{luop}[#2]}
\newcommandx{\cmdmthlbop}[2][2=]
  {\usrmth{#1}{BOp}{lbop}[#2]}
```

`\mthlrel` ... to do!

- `\mthlrel{\preceq}[sub][sup][Ext]` $= \preceq^{sup}_{sub}\,Ext$

```
%% Style for \LaTex Relations
\cmdmth{lrel}\newcommand{\mthstylrel}{\mathrel}
```

`\cmdmthlrel` ... to do!

- `\cmdmthlrel{cmdName};`
  `\cmdNameRel[sub][sub][ext]` $= cmdName^{sub}_{sub}\,ext$
- `\cmdmthlrel{cmdName}[\preceq];`
  `\cmdNameRel[sub][sub][ext]` $= \preceq^{sub}_{sub}\,ext$

```
\newcommandx{\cmdmthlrel}[2][2=]
  {\usrmth{#1}{Rel}{lrel}[#2]}

%%*************************************************************************%%
```

`\mthsnt, ...` ... to do!

- `\mthsnt{Name}[sub][sup][Ext]` $= \mathsf{Name}^{sup}_{sub}Ext$
- `\mthargsnt{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` $= \mathsf{Name}^{sup}_{sub}Ext1\Big(Arg^{Ex^{Ex}}\Big)Ext2$
- `\mthargsnt*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` $= \mathsf{Name}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparsnt{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` $= \mathsf{Name}^{sup}_{sub}Ext1\Big[Par^{Ex^{Ex}}\Big]Ext2$
- `\mthparsnt*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` $= \mathsf{Name}^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Sentences
\cmdmthall{snt}\newcommand{\mthstysnt}{\mathsf}
```

`\aSnt, ...` ... to do!

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
α, β, γ, δ, ϵ, ε, ζ, η, θ, ϑ, ι, κ, $\varkappa$, λ, μ, ν, ξ, o, π, ϖ, ρ, ϱ, σ, ς, τ, υ, ϕ, φ, χ, ψ, ω
A, B, Γ, Δ, E, E, Z, H, Θ, $\varTheta$, I, K, K, Λ, M, N, Ξ, O, Π, $\varPi$, P, P, Σ, $\varSigma$, T, ϒ, Φ, $\varPhi$, X, Ψ, Ω

```
\seqoflet{Snt}{mthsnt}
```

`\cmdmthsnt` ... to do!

- `\cmdmthsnt{cmdName};`
  `\cmdNameSnt[sub][sub][ext]` $= \mathsf{cmdName}^{sub}_{sub}ext$
- `\cmdmthsnt{cmdName}[NewName];`
  `\cmdNameSnt[sub][sub][ext]` $= \mathsf{NewName}^{sub}_{sub}ext$

```
\newcommandx{\cmdmthsnt}[2][2=]
  {\usrmth{#1}{Snt}{snt}[#2]}
```

`\cmdmthargsnt` ... to do!

- `\cmdmthargsnt{cmdName}`;
  `\cmdNameSnt[sub][sub][ext1]{arg}[ext2]` = $\mathsf{cmdName}^{sub}_{sub}ext1(arg)ext2$
- `\cmdmthargsnt{cmdName}[NewName]`;
  `\cmdNameSnt[sub][sub][ext1]{arg}[ext2]` = $\mathsf{NewName}^{sub}_{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargsnt}[2][2=]
  {\usrmth{#1}{Snt}{argsnt}[#2]}
```

`\cmdmthoargsnt` ... to do!

- `\cmdmthoargsnt{cmdName}`;
  `\cmdNameSnt[sub][sub][arg]` = $\mathsf{cmdName}^{sub}_{sub}(arg)$
- `\cmdmthoargsnt{cmdName}[NewName]`;
  `\cmdNameSnt[sub][sub][arg]` = $\mathsf{NewName}^{sub}_{sub}(arg)$

```
\newcommandx{\cmdmthoargsnt}[2][2=]
  {\usrmth{#1}{Snt}{oargsnt}[#2]}
```

`\cmdmthparsnt` ... to do!

- `\cmdmthparsnt{cmdName}`;
  `\cmdNameSnt[sub][sub][ext1]{par}[ext2]` = $\mathsf{cmdName}^{sub}_{sub}ext1[par]ext2$
- `\cmdmthparsnt{cmdName}[NewName]`;
  `\cmdNameSnt[sub][sub][ext1]{par}[ext2]` = $\mathsf{NewName}^{sub}_{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparsnt}[2][2=]
  {\usrmth{#1}{Snt}{parsnt}[#2]}
```

`\cmdmthoparsnt` ... to do!

- `\cmdmthoparsnt{cmdName}`;
  `\cmdNameSnt[sub][sub][par]` = $\mathsf{cmdName}^{sub}_{sub}[par]$
- `\cmdmthoparsnt{cmdName}[NewName]`;
  `\cmdNameSnt[sub][sub][par]` = $\mathsf{NewName}^{sub}_{sub}[par]$

```
\newcommandx{\cmdmthoparsnt}[2][2=]
  {\usrmth{#1}{Snt}{oparsnt}[#2]}
```

`\mthfrm, ...` ... to do!

- `\mthfrm{Name}[sub][sup][Ext]` = $Name^{sup}_{sub}Ext$
- `\mthargfrm{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $Name^{sup}_{sub}Ext1\Big(Arg^{Ex^{Ex}}\Big)Ext2$
- `\mthargfrm*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $Name^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparfrm{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $Name^{sup}_{sub}Ext1\Big[Par^{Ex^{Ex}}\Big]Ext2$
- `\mthparfrm*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $Name^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Formulae
\cmdmthall{frm}\newcommand{\mthstyfrm}{\mathit}
```

`\aFrm, ...` ... to do!

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
α, β, γ, δ, ϵ, ε, ζ, η, θ, ϑ, ι, κ, $\varkappa$, λ, μ, ν, ξ, o, π, ϖ, ρ, ϱ, σ, ς, τ, υ, ϕ, φ, χ, ψ, ω
A, B, Γ, Δ, E, E, Z, H, Θ, Θ, I, K, K, Λ, M, N, Ξ, O, Π, Π, P, P, Σ, Σ, T, Υ, Φ, Φ, X, Ψ, Ω

```
\seqoflet{Frm}{mthfrm}
```

`\cmdmthfrm` ... to do!

- `\cmdmthfrm{cmdName}`;
  `\cmdNameFrm[sub][sub][ext]` = $cmdName^{sub}_{sub}ext$
- `\cmdmthfrm{cmdName}[NewName]`;
  `\cmdNameFrm[sub][sub][ext]` = $NewName^{sub}_{sub}ext$

```
\newcommandx{\cmdmthfrm}[2][2=]
  {\usrmth{#1}{Frm}{frm}[#2]}
```

\cmdmthargfrm ... to do!

- \cmdmthargfrm{cmdName};
  \cmdNameFrm[sub][sub][ext1]{arg}[ext2] = $cmdName^{sub}_{sub}ext1(arg)ext2$
- \cmdmthargfrm{cmdName}[NewName];
  \cmdNameFrm[sub][sub][ext1]{arg}[ext2] = $NewName^{sub}_{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargfrm}[2][2=]
  {\usrmth{#1}{Frm}{argfrm}[#2]}
```

\cmdmthoargfrm ... to do!

- \cmdmthoargfrm{cmdName};
  \cmdNameFrm[sub][sub][arg] = $cmdName^{sub}_{sub}(arg)$
- \cmdmthoargfrm{cmdName}[NewName];
  \cmdNameFrm[sub][sub][arg] = $NewName^{sub}_{sub}(arg)$

```
\newcommandx{\cmdmthoargfrm}[2][2=]
  {\usrmth{#1}{Frm}{oargfrm}[#2]}
```

\cmdmthparfrm ... to do!

- \cmdmthparfrm{cmdName};
  \cmdNameFrm[sub][sub][ext1]{par}[ext2] = $cmdName^{sub}_{sub}ext1[par]ext2$
- \cmdmthparfrm{cmdName}[NewName];
  \cmdNameFrm[sub][sub][ext1]{par}[ext2] = $NewName^{sub}_{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparfrm}[2][2=]
  {\usrmth{#1}{Frm}{parfrm}[#2]}
```

\cmdmthoparfrm ... to do!

- \cmdmthoparfrm{cmdName};
  \cmdNameFrm[sub][sub][par] = $cmdName^{sub}_{sub}[par]$
- \cmdmthoparfrm{cmdName}[NewName];
  \cmdNameFrm[sub][sub][par] = $NewName^{sub}_{sub}[par]$

```
\newcommandx{\cmdmthoparfrm}[2][2=]
  {\usrmth{#1}{Frm}{oparfrm}[#2]}
```

```
%%*************************************************************************%%
```

\mthmat, ... to do!

- \mthmat{Name}[sub][sup][Ext] = $\mathbf{Name}^{sup}_{sub}Ext$
- \mthargmat{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2] = $\mathbf{Name}^{sup}_{sub}Ext1\Big(Arg^{Ex^{Ex}}\Big)Ext2$
- \mthargmat*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2] = $\mathbf{Name}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- \mthparmat{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2] = $\mathbf{Name}^{sup}_{sub}Ext1\Big[Par^{Ex^{Ex}}\Big]Ext2$
- \mthparmat*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2] = $\mathbf{Name}^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Matrices
\cmdmthall{mat}\newcommand{\mthstymat}[1]{\boldsymbol{\mathsf{#1}}}
```

\aMat, ... to do!

$\mathbf{a}$, $\mathbf{b}$, $\mathbf{c}$, $\mathbf{d}$, $\mathbf{e}$, $\mathbf{f}$, $\mathbf{g}$, $\mathbf{h}$, $\mathbf{i}$, $\mathbf{j}$, $\mathbf{k}$, $\mathbf{l}$, $\mathbf{m}$, $\mathbf{n}$, $\mathbf{o}$, $\mathbf{p}$, $\mathbf{q}$, $\mathbf{r}$, $\mathbf{s}$, $\mathbf{t}$, $\mathbf{u}$, $\mathbf{v}$, $\mathbf{w}$, $\mathbf{x}$, $\mathbf{y}$, $\mathbf{z}$
$\mathbf{A}$, $\mathbf{B}$, $\mathbf{C}$, $\mathbf{D}$, $\mathbf{E}$, $\mathbf{F}$, $\mathbf{G}$, $\mathbf{H}$, $\mathbf{I}$, $\mathbf{J}$, $\mathbf{K}$, $\mathbf{L}$, $\mathbf{M}$, $\mathbf{N}$, $\mathbf{O}$, $\mathbf{P}$, $\mathbf{Q}$, $\mathbf{R}$, $\mathbf{S}$, $\mathbf{T}$, $\mathbf{U}$, $\mathbf{V}$, $\mathbf{W}$, $\mathbf{X}$, $\mathbf{Y}$, $\mathbf{Z}$
$\boldsymbol{\alpha}$, $\boldsymbol{\beta}$, $\boldsymbol{\gamma}$, $\boldsymbol{\delta}$, $\boldsymbol{\epsilon}$, $\boldsymbol{\varepsilon}$, $\boldsymbol{\zeta}$, $\boldsymbol{\eta}$, $\boldsymbol{\theta}$, $\boldsymbol{\vartheta}$, $\boldsymbol{\iota}$, $\boldsymbol{\kappa}$, $\boldsymbol{\varkappa}$, $\boldsymbol{\lambda}$, $\boldsymbol{\mu}$, $\boldsymbol{\nu}$, $\boldsymbol{\xi}$, $\mathbf{o}$, $\boldsymbol{\pi}$, $\boldsymbol{\varpi}$, $\boldsymbol{\rho}$, $\boldsymbol{\varrho}$, $\boldsymbol{\sigma}$, $\boldsymbol{\varsigma}$, $\boldsymbol{\tau}$, $\boldsymbol{\upsilon}$, $\boldsymbol{\phi}$, $\boldsymbol{\varphi}$, $\boldsymbol{\chi}$, $\boldsymbol{\psi}$, $\boldsymbol{\omega}$
$\mathbf{A}$, $\mathbf{B}$, $\boldsymbol{\Gamma}$, $\boldsymbol{\Delta}$, $\mathbf{E}$, $\mathbf{E}$, $\mathbf{Z}$, $\mathbf{H}$, $\boldsymbol{\Theta}$, $\boldsymbol{\varTheta}$, $\mathbf{I}$, $\mathbf{K}$, $\mathbf{K}$, $\boldsymbol{\Lambda}$, $\mathbf{M}$, $\mathbf{N}$, $\boldsymbol{\Xi}$, $\mathbf{O}$, $\boldsymbol{\Pi}$, $\boldsymbol{\varPi}$, $\mathbf{P}$, $\mathbf{P}$, $\boldsymbol{\Sigma}$, $\boldsymbol{\varSigma}$, $\mathbf{T}$, $\boldsymbol{\Upsilon}$, $\boldsymbol{\Phi}$, $\boldsymbol{\varPhi}$, $\mathbf{X}$, $\boldsymbol{\Psi}$, $\boldsymbol{\Omega}$

```
\seqoflet{Mat}{mthmat}
```

\cmdmthmat ... to do!

- \cmdmthmat{cmdName};
  \cmdNameMat[sub][sub][ext] = $\mathbf{cmdName}^{sub}_{sub}ext$
- \cmdmthmat{cmdName}[NewName];
  \cmdNameMat[sub][sub][ext] = $\mathbf{NewName}^{sub}_{sub}ext$

```
\newcommandx{\cmdmthmat}[2][2=]
  {\usrmth{#1}{Mat}{mat}[#2]}
```

`\cmdmthargmat` ... to do!

- `\cmdmthargmat{cmdName};`
  `\cmdNameMat[sub][sub][ext1]{arg}[ext2]` = $\mathbf{cmdName}^{sub}_{sub}ext1(arg)ext2$
- `\cmdmthargmat{cmdName}[NewName];`
  `\cmdNameMat[sub][sub][ext1]{arg}[ext2]` = $\mathbf{NewName}^{sub}_{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargmat}[2][2=]
  {\usrmth{#1}{Mat}{argmat}[#2]}
```

`\cmdmthoargmat` ... to do!

- `\cmdmthoargmat{cmdName};`
  `\cmdNameMat[sub][sub][arg]` = $\mathbf{cmdName}^{sub}_{sub}(arg)$
- `\cmdmthoargmat{cmdName}[NewName];`
  `\cmdNameMat[sub][sub][arg]` = $\mathbf{NewName}^{sub}_{sub}(arg)$

```
\newcommandx{\cmdmthoargmat}[2][2=]
  {\usrmth{#1}{Mat}{oargmat}[#2]}
```

`\cmdmthparmat` ... to do!

- `\cmdmthparmat{cmdName};`
  `\cmdNameMat[sub][sub][ext1]{par}[ext2]` = $\mathbf{cmdName}^{sub}_{sub}ext1[par]ext2$
- `\cmdmthparmat{cmdName}[NewName];`
  `\cmdNameMat[sub][sub][ext1]{par}[ext2]` = $\mathbf{NewName}^{sub}_{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparmat}[2][2=]
  {\usrmth{#1}{Mat}{parmat}[#2]}
```

`\cmdmthoparmat` ... to do!

- `\cmdmthoparmat{cmdName};`
  `\cmdNameMat[sub][sub][par]` = $\mathbf{cmdName}^{sub}_{sub}[par]$
- `\cmdmthoparmat{cmdName}[NewName];`
  `\cmdNameMat[sub][sub][par]` = $\mathbf{NewName}^{sub}_{sub}[par]$

```
\newcommandx{\cmdmthoparmat}[2][2=]
  {\usrmth{#1}{Mat}{oparmat}[#2]}
```

`\mthvec, ...` ... to do!

- `\mthvec{Name}[sub][sup][Ext]` = $\boldsymbol{Name}^{sup}_{sub}Ext$
- `\mthargvec{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\boldsymbol{Name}^{sup}_{sub}Ext1\left(Arg^{Ex^{Ex}}\right)Ext2$
- `\mthargvec*{Name}[sub][sup][Ext1]{Arg^{Ex^{Ex}}}[Ext2]` = $\boldsymbol{Name}^{sup}_{sub}Ext1(Arg^{Ex^{Ex}})Ext2$
- `\mthparvec{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\boldsymbol{Name}^{sup}_{sub}Ext1\left[Par^{Ex^{Ex}}\right]Ext2$
- `\mthparvec*{Name}[sub][sup][Ext1]{Par^{Ex^{Ex}}}[Ext2]` = $\boldsymbol{Name}^{sup}_{sub}Ext1[Par^{Ex^{Ex}}]Ext2$

```
%% Style for Vectors
\cmdmthall{vec}\newcommand{\mthstyvec}[1]{\boldsymbol{\mathit{#1}}}
```

`\aVec, ...` ... to do!

$\boldsymbol{a}$, $\boldsymbol{b}$, $\boldsymbol{c}$, $\boldsymbol{d}$, $\boldsymbol{e}$, $\boldsymbol{f}$, $\boldsymbol{g}$, $\boldsymbol{h}$, $\boldsymbol{i}$, $\boldsymbol{j}$, $\boldsymbol{k}$, $\boldsymbol{l}$, $\boldsymbol{m}$, $\boldsymbol{n}$, $\boldsymbol{o}$, $\boldsymbol{p}$, $\boldsymbol{q}$, $\boldsymbol{r}$, $\boldsymbol{s}$, $\boldsymbol{t}$, $\boldsymbol{u}$, $\boldsymbol{v}$, $\boldsymbol{w}$, $\boldsymbol{x}$, $\boldsymbol{y}$, $\boldsymbol{z}$
$\boldsymbol{A}$, $\boldsymbol{B}$, $\boldsymbol{C}$, $\boldsymbol{D}$, $\boldsymbol{E}$, $\boldsymbol{F}$, $\boldsymbol{G}$, $\boldsymbol{H}$, $\boldsymbol{I}$, $\boldsymbol{J}$, $\boldsymbol{K}$, $\boldsymbol{L}$, $\boldsymbol{M}$, $\boldsymbol{N}$, $\boldsymbol{O}$, $\boldsymbol{P}$, $\boldsymbol{Q}$, $\boldsymbol{R}$, $\boldsymbol{S}$, $\boldsymbol{T}$, $\boldsymbol{U}$, $\boldsymbol{V}$, $\boldsymbol{W}$, $\boldsymbol{X}$, $\boldsymbol{Y}$, $\boldsymbol{Z}$
$\boldsymbol{\alpha}$, $\boldsymbol{\beta}$, $\boldsymbol{\gamma}$, $\boldsymbol{\delta}$, $\boldsymbol{\epsilon}$, $\boldsymbol{\varepsilon}$, $\boldsymbol{\zeta}$, $\boldsymbol{\eta}$, $\boldsymbol{\theta}$, $\boldsymbol{\vartheta}$, $\boldsymbol{\iota}$, $\boldsymbol{\kappa}$, $\boldsymbol{\varkappa}$, $\boldsymbol{\lambda}$, $\boldsymbol{\mu}$, $\boldsymbol{\nu}$, $\boldsymbol{\xi}$, $\boldsymbol{o}$, $\boldsymbol{\pi}$, $\boldsymbol{\varpi}$, $\boldsymbol{\rho}$, $\boldsymbol{\varrho}$, $\boldsymbol{\sigma}$, $\boldsymbol{\varsigma}$, $\boldsymbol{\tau}$, $\boldsymbol{\upsilon}$, $\boldsymbol{\phi}$, $\boldsymbol{\varphi}$, $\boldsymbol{\chi}$, $\boldsymbol{\psi}$, $\boldsymbol{\omega}$
$\boldsymbol{A}$, $\boldsymbol{B}$, $\boldsymbol{\Gamma}$, $\boldsymbol{\Delta}$, $\boldsymbol{E}$, $\boldsymbol{E}$, $\boldsymbol{Z}$, $\boldsymbol{H}$, $\boldsymbol{\Theta}$, $\boldsymbol{\Theta}$, $\boldsymbol{I}$, $\boldsymbol{K}$, $\boldsymbol{K}$, $\boldsymbol{\Lambda}$, $\boldsymbol{M}$, $\boldsymbol{N}$, $\boldsymbol{\Xi}$, $\boldsymbol{O}$, $\boldsymbol{\Pi}$, $\boldsymbol{\Pi}$, $\boldsymbol{P}$, $\boldsymbol{P}$, $\boldsymbol{\Sigma}$, $\boldsymbol{\Sigma}$, $\boldsymbol{T}$, $\boldsymbol{\Upsilon}$, $\boldsymbol{\Phi}$, $\boldsymbol{\Phi}$, $\boldsymbol{X}$, $\boldsymbol{\Psi}$, $\boldsymbol{\Omega}$

```
\seqoflet{Vec}{mthvec}
```

`\cmdmthvec` ... to do!

- `\cmdmthvec{cmdName};`
  `\cmdNameVec[sub][sub][ext]` = $\boldsymbol{cmdName}^{sub}_{sub}ext$
- `\cmdmthvec{cmdName}[NewName];`
  `\cmdNameVec[sub][sub][ext]` = $\boldsymbol{NewName}^{sub}_{sub}ext$

```
\newcommandx{\cmdmthvec}[2][2=]
  {\usrmth{#1}{Vec}{vec}[#2]}
```

`\cmdmthargvec` ... to do!

- `\cmdmthargvec{cmdName}`;
  `\cmdNameVec[sub][sub][ext1]{arg}[ext2]` = $\boldsymbol{cmdName}^{sub}_{sub}ext1(arg)ext2$
- `\cmdmthargvec{cmdName}[NewName]`;
  `\cmdNameVec[sub][sub][ext1]{arg}[ext2]` = $\boldsymbol{NewName}^{sub}_{sub}ext1(arg)ext2$

```
\newcommandx{\cmdmthargvec}[2][2=]
  {\usrmth{#1}{Vec}{argvec}[#2]}
```

`\cmdmthoargvec` ... to do!

- `\cmdmthoargvec{cmdName}`;
  `\cmdNameVec[sub][sub][arg]` = $\boldsymbol{cmdName}^{sub}_{sub}(arg)$
- `\cmdmthoargvec{cmdName}[NewName]`;
  `\cmdNameVec[sub][sub][arg]` = $\boldsymbol{NewName}^{sub}_{sub}(arg)$

```
\newcommandx{\cmdmthoargvec}[2][2=]
  {\usrmth{#1}{Vec}{oargvec}[#2]}
```

`\cmdmthparvec` ... to do!

- `\cmdmthparvec{cmdName}`;
  `\cmdNameVec[sub][sub][ext1]{par}[ext2]` = $\boldsymbol{cmdName}^{sub}_{sub}ext1[par]ext2$
- `\cmdmthparvec{cmdName}[NewName]`;
  `\cmdNameVec[sub][sub][ext1]{par}[ext2]` = $\boldsymbol{NewName}^{sub}_{sub}ext1[par]ext2$

```
\newcommandx{\cmdmthparvec}[2][2=]
  {\usrmth{#1}{Vec}{parvec}[#2]}
```

`\cmdmthoparvec` ... to do!

- `\cmdmthoparvec{cmdName}`;
  `\cmdNameVec[sub][sub][par]` = $\boldsymbol{cmdName}^{sub}_{sub}[par]$
- `\cmdmthoparvec{cmdName}[NewName]`;
  `\cmdNameVec[sub][sub][par]` = $\boldsymbol{NewName}^{sub}_{sub}[par]$

```
\newcommandx{\cmdmthoparvec}[2][2=]
  {\usrmth{#1}{Vec}{oparvec}[#2]}

\fi
%%*****************************************************************************%%
%%*****************************************************************************%%
%%** Elementary Macros for Text ************************************************%%
%%*****************************************************************************%%
\iftext@
%%** Latin Abbreviations *******************************************************%%
```

`\adhoc`

- `\adhoc` = *ad hoc*

```
\cmdtxtabr{adhoc}[ad hoc]
```

`\afortiori`

- `\afortiori` = *a fortiori*

```
\cmdtxtabr{afortiori}[a fortiori]
```

`\apriori`

- `\apriori` = *a priori*

```
\cmdtxtabr{apriori}[a priori]
```

`\aposteriori`

- `\aposteriori` = *a posteriori*

```
\cmdtxtabr{aposteriori}[a posteriori]
```

`\cf`

- `\cf` = *cf.*

```
\cmdtxtabr{cf}[cf.]
```

\dedicto • \dedicto = *de dicto*

```
\cmdtxtabr{dedicto}[de dicto]
```

\defacto • \defacto = *de facto*

```
\cmdtxtabr{defacto}[de facto]
```

\dere • \dere = *de re*

```
\cmdtxtabr{dere}[de re]
```

\divideetimpera • \divideetimpera = *divide et impera*

```
\cmdtxtabr{divideetimpera}[divide et impera]
```

\eg • \eg = *e.g.*

```
\cmdtxtabr{eg}[e.g.]
```

\ergo • \ergo = *ergo*

```
\cmdtxtabr{ergo}
```

\errata • \errata = *errata*

```
\cmdtxtabr{errata}
```

\erratum • \erratum = *erratum*

```
\cmdtxtabr{erratum}
```

\etal • \etal = *et al.*

```
\cmdtxtabr{etal}[et al.]
```

\etc • \etc = *etc.*

```
\cmdtxtabr{etc}[etc.]
```

\ie • \ie = *i.e.*

```
\cmdtxtabr{ie}[i.e.]
```

\mutatismutandis • \mutatismutandis = *mutatis mutandis*

```
\cmdtxtabr{mutatismutandis}[mutatis mutandis]
```

\percontra • \percontra = *per contra*

```
\cmdtxtabr{percontra}[per contra]
```

\primafacie • \primafacie = *prima facie*

```
\cmdtxtabr{primafacie}[prima facie]
```

\viceversa • \viceversa = *vice versa*

```
\cmdtxtabr{viceversa}[vice versa]
```

\vs • \vs = *vs.*

```
\cmdtxtabr{vs}[vs.]
```

\viz • \viz = *viz.*

```
\cmdtxtabr{viz}[viz.]
```

```
%%*****************************************************************************%%
```

\Afortiori • \Afortiori = *A fortiori*

```
\cmdtxtabr{Afortiori}[A fortiori]
```

\Apriori • \Apriori = *A priori*

```
\cmdtxtabr{Apriori}[A priori]
```

\Aposteriori • \Aposteriori = *A posteriori*

```
767 \cmdtxtabr{Aposteriori}[A posteriori]
```

\Dedicto • \Dedicto = *De dicto*

```
768 \cmdtxtabr{Dedicto}[De dicto]
```

\Defacto • \Defacto = *De facto*

```
769 \cmdtxtabr{Defacto}[De facto]
```

\Dere • \Dere = *De re*

```
770 \cmdtxtabr{Dere}[De re]
```

\Divideetimpera • \Divideetimpera = *Divide et impera*

```
771 \cmdtxtabr{Divideetimpera}[Divide et impera]
```

\Eg • \Eg = *E.g.*

```
772 \cmdtxtabr{Eg}[E.g.]
```

\Errata • \Errata = *Errata*

```
773 \cmdtxtabr{Errata}
```

\Erratum • \Erratum = *Erratum*

```
774 \cmdtxtabr{Erratum}
```

\Mutatismutandis • \Mutatismutandis = *Mutatis mutandis*

```
775 \cmdtxtabr{Mutatismutandis}[Mutatis mutandis]
```

\Percontra • \Percontra = *Per contra*

```
776 \cmdtxtabr{Percontra}[Per contra]
```

\Primafacie • \Primafacie = *Prima facie*

```
777 \cmdtxtabr{Primafacie}[Prima facie]
```

\Viceversa • \Viceversa = *Vice versa*

```
778 \cmdtxtabr{Viceversa}[Vice versa]
```

```
779 %%** Italian Abbreviations ******************************************************%%
```

...

```
780 %%*************************************************************************%%
```

...

```
781 %%** French Abbreviations ******************************************************%%
```

\naif • \naif = *naïf*

```
782 \cmdtxtabr{naif}[na\"{i}f]
```

\naive • \naive = *naïve*

```
783 \cmdtxtabr{naive}[na\"{i}ve]
```

\role • \role = *rôle*

```
784 \cmdtxtabr{role}[r\^{o}le]
```

```
785 %%*************************************************************************%%
```

\Role • \Role = *Rôle*

```
786 \cmdtxtabr{Role}[R\^{o}le]
```

```
787 %%** English Abbreviations *****************************************************%%
```

\aka • \aka = *a.k.a.*

```
\cmdtxtabr{aka}[a.k.a.]
```

\contd • \contd = *contd.*

```
\cmdtxtabr{contd}[contd.]
```

\iff • \iff = *iff*

```
\cmdtxtabr{iff}
```

\iht • \iht = *i.h.t.*

```
\cmdtxtabr{iht}[i.h.t.]
```

\stx • \stx = *s.t.*

```
\cmdtxtabr{stx}[s.t.]
```

\resp • \resp = *resp.*

```
\cmdtxtabr{resp}[resp.]
```

\wrt • \wrt = *w.r.t.*

```
\cmdtxtabr{wrt}[w.r.t.]
```

\wlogx • \wlogx = *w.l.o.g.*

```
\cmdtxtabr{wlogx}[w.l.o.g.]

%%*************************************************************************%%
```

\Contd • \Contd = *Contd.*

```
\cmdtxtabr{Contd}[Contd.]
```

\Wlogx • \Wlogx = *W.l.o.g.*

```
\cmdtxtabr{Wlogx}[W.l.o.g.]

\fi
%%*************************************************************************%%
%%*************************************************************************%%
%%** Elementary Macros for Math *******************************************%%
%%*************************************************************************%%
\ifmath@
%%** General Notation *****************************************************%%
```

\defeq, \seteq ...

```
\DeclareRobustCommand{\defeq}
  {\@ifstar%
    {\mthlbop{\stackrel{\text{\textup{def}}}{=}}%
    {\mthlbop{\triangleq}}}
\DeclareRobustCommand{\seteq}
  {\@ifstar{\mthlbop{:=}}{\mthlbop{:=}}}

%%*************************************************************************%%
```

\implies, ...

```
\DeclareRobustCommand{\implies}
  {\mthlrel{\Rightarrow}}
\DeclareRobustCommand{\notimplies}
  {\mthlrel{\not\Rightarrow}}
```

\implied, ...

```
\DeclareRobustCommand{\implied}
  {\mthlrel{\Leftarrow}}
\DeclareRobustCommand{\notimplied}
  {\mthlrel{\not\Leftarrow}}
```

\coimplies, ... …

```
\DeclareRobustCommand{\coimplies}
  {\mthlrel{\Leftrightarrow}}
\DeclareRobustCommand{\notcoimplies}
  {\mthlrel{\not\!\Leftrightarrow}}
%%**************************************************************************%%
```

\cmodels, ... …

```
\DeclareRobustCommand{\cmodels}
  {\mthlrel{\models}}
\DeclareRobustCommand{\notcmodels}
  {\mthlrel{\not\models}}
```

\cequiv, ... …

```
\DeclareRobustCommand{\cequiv}
  {\mthlrel{\equiv}}
\DeclareRobustCommand{\notcequiv}
  {\mthlrel{\not\equiv}}
%%**************************************************************************%%
```

\denot …

```
\DeclareRobustCommand{\denot}
  {\@ifstar{\@denot}{\@denot[\left][\right]}}
\DeclareRobustCommandx{\@denot}[3][1=, 2=]
  {\mth{\argmid{#1\llbracket}{#3}{#2\rrbracket}}}
%%**************************************************************************%%
```

\dual, \adj, ... …

```
\DeclareRobustCommand{\dual}[1]
  {\mth{\overline{#1}}}
\DeclareRobustCommand{\adj}[1]
  {\mth{\mathring{#1}}}
\DeclareRobustCommand{\der}[1]
  {\mth{\widehat{#1}}}
\DeclareRobustCommand{\trn}[1]
  {\mth{\widetilde{#1}}}
```

\vec …

```
\DeclareRobustCommand{\vec}
  {\@ifstar{\@svec}{\@vec}}
\DeclareRobustCommand{\@vec}[1]
  {\mth{\mathaccent"017E{#1}}}
\DeclareRobustCommand{\@svec}[1]
  {\mth{\overline{#1}}}
%%**************************************************************************%%
```

\enumeration, ... …

```
\varcmd{enumeration}{\mth}{}{,}{}{}
\varcmd{enumerationx}{\mth}{}{;}{}{}
```

\sequence, ... …

```
\varcmd{sequence}{\mth}{\left[}{,}{\right]}{}
\varcmd{sequencel}{\mth}{\left[}{,}{\right.}{}
\varcmd{sequencer}{\mth}{\left.}{,}{\right]}{}
\varcmd{sequencex}{\mth}{\left[}{;}{\right]}{}
\varcmd{sequencexl}{\mth}{\left[}{;}{\right.}{}
\varcmd{sequencexr}{\mth}{\left.}{;}{\right]}{}
```

```
\tuple, ...  ...
863 \varcmd{tuple}{\mth}{\left\langle}{,}{\right\rangle}{}
864 \varcmd{tuplel}{\mth}{\left\langle}{,}{\right.}{}
865 \varcmd{tupler}{\mth}{\left.}{,}{\right\rangle}{}
866 \varcmd{tuplex}{\mth}{\left\langle}{;}{\right\rangle}{}
867 \varcmd{tuplexl}{\mth}{\left\langle}{;}{\right.}{}
868 \varcmd{tuplexr}{\mth}{\left.}{;}{\right\rangle}{}

869 %%** Sets ********************************************************************%%

  \set, ...  ...
870 \DeclareRobustCommand{\set}
871   {\@ifstar{\@set}{\@set[\left][\middle][\right]}}
872 \DeclareRobustCommandx{\@set}[5][1=, 2=, 3=]
873   {\mth{\argmid{#1\lbrace}{\argsep{#4}{\,#2\vert\,}{#5}}{#3\rbrace}}}
874 \DeclareRobustCommand{\setl}
875   {\@ifstar{\@setl}{\@setl[\left][\right]}}
876 \DeclareRobustCommandx{\@setl}[3][1=, 2=]
877   {\mth{\argmid{#1\lbrace}{#3}{\,#2\vert\!}}}
878 \DeclareRobustCommand{\setr}
879   {\@ifstar{\@setr}{\@setr[\left.][\right]}}
880 \DeclareRobustCommandx{\@setr}[3][1=, 2=]
881   {\mth{\argmid{#1}{#3}{#2\rbrace}}}

      \card  ...
882 \DeclareRobustCommand{\card}
883   {\@ifstar{\@card}{\@card[\left][\right]}}
884 \DeclareRobustCommandx{\@card}[3][1=, 2=]
885   {\mth{\argmid{#1\lvert}{#3}{#2\rvert}}}

       \pow  ...
886 \DeclareRobustCommand{\pow}[1]
887   {\mth{2^{\defval{#1}{\cdot}}}}

888 %%** Relations ******************************************************************%%

  \emptyrel  ...
889 \DeclareRobustCommand{\emptyrel}
890   {\mth{\varnothing}}

891 %%*****************************************************************************%%

\dom, \cod, ...  ...
892 \usrmth{dom}{}{argfun}
893 \usrmth{cod}{}{argfun}
894 \usrmth{rng}{}{argfun}
895 \usrmth{img}{}{argfun}

896 %%*****************************************************************************%%

       \prj  ...
897 \DeclareRobustCommand{\prj}
898   {\mthargfun{prj}}

       \rst  ...
899 \DeclareRobustCommand{\rst}
900   {\mthlbop{\upharpoonright}}

       \cmp  ...
901 \DeclareRobustCommand{\cmp}
902   {\mthlbop{\circ}}

903 %%** Functions ******************************************************************%%
```

\emptyfun …

```
\DeclareRobustCommand{\emptyfun}
  {\mth{\varnothing}}
```

```
%%************************************************************************%%
```

\pto, \pmapsto …

```
\DeclareMathOperator{\pto}
  {\ensuremath{\rightharpoonup}}
\DeclareMathOperator{\pmapsto}
  {\ensuremath{\mathrel{\raisebox{0.5ex}{\footnotesize${\llcorner}$}%
    \kern-1.5ex\rightharpoonup}}}
```

```
%%************************************************************************%%
```

\fix, \ifp, ... …

```
\usrmth{fix}{}{fun}
\usrmth{ifp}{}{fun}
\usrmth{lfp}{}{fun}
\usrmth{gfp}{}{fun}
```

```
%%************************************************************************%%
```

\Aomega, \AOmega …

```
\usrmth{Aomega}{}{argset}[\omega]
\usrmth{AOmega}{}{argset}[\Omega]
```

\Atheta, \ATheta …

```
\usrmth{Atheta}{}{argset}[\theta]
\usrmth{ATheta}{}{argset}[\Theta]
```

\Aomicron, ... …

```
\usrmth{Aomicron}{}{argset}[\omicron]
\usrmth{AOmicron}{}{argset}[\Omicron]
```

```
%%** Numbers ************************************************************%%
```

\SetB …

```
\DeclareRobustCommand{\SetB}
  {\mthset[mathbb]{B}}
```

\SetF …

```
\DeclareRobustCommand{\SetF}
  {\mthset[mathbb]{F}}
```

\SetN, ... …

```
\DeclareRobustCommand{\SetN}
  {\mthset[mathbb]{N}}
\DeclareRobustCommand{\SetNI}[1][]
  {\SetN[\infty #1]}
```

\SetZ, ... …

```
\DeclareRobustCommand{\SetZ}
  {\mthset[mathbb]{Z}}
\DeclareRobustCommand{\SetZI}[1][]
  {\SetZ[\pm\infty #1]}
\DeclareRobustCommand{\SetZPI}[1][]
  {\SetZ[+\infty #1]}
\DeclareRobustCommand{\SetZNI}[1][]
  {\SetZ[-\infty #1]}
```

```
\SetQ, ...  ...
941 \DeclareRobustCommand{\SetQ}
942   {\mthset[mathbb]{Q}}
943 \DeclareRobustCommand{\SetQI}[1][]
944   {\SetQ[\pm\infty #1]}
945 \DeclareRobustCommand{\SetQPI}[1][]
946   {\SetQ[+\infty #1]}
947 \DeclareRobustCommand{\SetQNI}[1][]
948   {\SetQ[-\infty #1]}

\SetR, ...  ...
949 \DeclareRobustCommand{\SetR}
950   {\mthset[mathbb]{R}}
951 \DeclareRobustCommand{\SetRI}[1][]
952   {\SetR[\pm\infty #1]}
953 \DeclareRobustCommand{\SetRPI}[1][]
954   {\SetR[+\infty #1]}
955 \DeclareRobustCommand{\SetRNI}[1][]
956   {\SetR[-\infty #1]}

\SetC, ...  ...
957 \DeclareRobustCommand{\SetC}
958   {\mthset[mathbb]{C}}
959 \DeclareRobustCommand{\SetCI}[1][]
960   {\SetC[\infty #1]}

961 %%*************************************************************************%%

 \num, ...  ...
962 \DeclareRobustCommand{\num}[1]
963   {\mth{[#1]}}
964 \DeclareRobustCommand{\numcc}[2]
965   {\mth{[\argsep{#1}{,}{#2}]}}
966 \DeclareRobustCommand{\numco}[2]
967   {\mth{[\argsep{#1}{,}{#2})}}
968 \DeclareRobustCommand{\numoc}[2]
969   {\mth{(\argsep{#1}{,}{#2}]}}
970 \DeclareRobustCommand{\numoo}[2]
971   {\mth{(\argsep{#1}{,}{#2})}}

972 %%*************************************************************************%%

      \abs  ...
973 \DeclareRobustCommand{\abs}
974   {\@ifstar{\@abs}{\@abs[\left][\right]}}
975 \DeclareRobustCommandx{\@abs}[3][1=, 2=]
976   {\mth{\argmid{#1\lvert}{#3}{#2\rvert}}}

\floor, \ceil  ...
977 \DeclareRobustCommand{\floor}
978   {\@ifstar{\@floor}{\@floor[\left][\right]}}
979 \DeclareRobustCommandx{\@floor}[3][1=, 2=]
980   {\mth{\argmid{#1\lfloor}{#3}{#2\rfloor}}}
981 \DeclareRobustCommand{\ceil}
982   {\@ifstar{\@ceil}{\@ceil[\left][\right]}}
983 \DeclareRobustCommandx{\@ceil}[3][1=, 2=]
984   {\mth{\argmid{#1\lceil}{#3}{#2\rceil}}}

985 %%*************************************************************************%%

      \arg  ...
986 \usrmth{arg}{}{fun}
```

`\evn, \odd` ...

```
\usrmth{evn}{}{fun}
\usrmth{odd}{}{fun}
```

`\bst, ...` ...

```
\usrmth{bst}{}{fun}
\usrmth{argbst}{}{fun}[arg\,bst]
```

`\min, \max, ...` ...

```
\usrmth{min}{}{fun}
\usrmth{max}{}{fun}
\usrmth{argmin}{}{fun}[arg\,min]
\usrmth{argmax}{}{fun}[arg\,max]
```

`\inf, \sup` ...

```
\usrmth{inf}{}{fun}
\usrmth{sup}{}{fun}
```

```
%%** Sequences ********************************************************************%%
```

`\emptyseq` ...

```
\DeclareRobustCommand{\emptyseq}
  {\mth{\varepsilon}}
```

`\len` ...

```
\DeclareRobustCommand{\len}
  {\@ifstar{\@len}{\@len[\left][\right]}}
\DeclareRobustCommandx{\@len}[3][1=, 2=]
  {\mth{\argmid{#1\lvert}{#3}{#2\rvert}}}
```

`\fst, \lst` ...

```
\usrmth{fst}{}{argfun}
\usrmth{lst}{}{argfun}
```

```
\fi
%%*****************************************************************************%%
%%*****************************************************************************%%
%%** Macros for Computational-Complexity Classes ****************************%%
%%*****************************************************************************%%
\ifcom@
```

`\defcomcls` ... to do!

- `\defcomcls{CompClass}`;

  `\CompClass[sub][sup][arg]` = $\textsc{CompClass}_{\text{SUB}}^{\text{SUP}}(\text{ARG})$

- `\defcomcls{CompClass}[NewClass]`;

  `\CompClass[sub][sup][arg]` = $\textsc{NewClass}_{\text{SUB}}^{\text{SUP}}(\text{ARG})$

```
\newcommandx{\defcomcls}[2][2=]
  {\csdef{#1}{\txtoargcom{\defval{#2}{#1}}}}
```

`\defcomclsgrp` ... to do!

- `\defcomclsgrp{CompClass}`;

  `\CompClass[sub][sup][arg]` = $\textsc{CompClass}_{\text{SUB}}^{\text{SUP}}(\text{ARG})$
  `\CoCompClass[sub][sup][arg]` = $\textsc{CoCompClass}_{\text{SUB}}^{\text{SUP}}(\text{ARG})$
  `\CompClassE[sub][sup][arg]` = $\textsc{CompClass-easy}_{\text{SUB}}^{\text{SUP}}(\text{ARG})$
  `\CoCompClassE[sub][sup][arg]` = $\textsc{CoCompClass-easy}_{\text{SUB}}^{\text{SUP}}(\text{ARG})$
  `\CompClassH[sub][sup][arg]` = $\textsc{CompClass-hard}_{\text{SUB}}^{\text{SUP}}(\text{ARG})$
  `\CoCompClassH[sub][sup][arg]` = $\textsc{CoCompClass-hard}_{\text{SUB}}^{\text{SUP}}(\text{ARG})$

`\CompClassC[sub][sup][arg]` = CompClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoCompClassC[sub][sup][arg]` = CoCompClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)

`\NCompClass[sub][sup][arg]` = NCompClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoNCompClass[sub][sup][arg]` = CoNCompClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\NCompClassE[sub][sup][arg]` = NCompClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoNCompClassE[sub][sup][arg]` = CoNCompClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\NCompClassH[sub][sup][arg]` = NCompClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoNCompClassH[sub][sup][arg]` = CoNCompClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\NCompClassC[sub][sup][arg]` = NCompClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoNCompClassC[sub][sup][arg]` = CoNCompClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)

`\UCompClass[sub][sup][arg]` = UCompClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoUCompClass[sub][sup][arg]` = CoUCompClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\UCompClassE[sub][sup][arg]` = UCompClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoUCompClassE[sub][sup][arg]` = CoUCompClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\UCompClassH[sub][sup][arg]` = UCompClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoUCompClassH[sub][sup][arg]` = CoUCompClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\UCompClassC[sub][sup][arg]` = UCompClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoUCompClassC[sub][sup][arg]` = CoUCompClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)

`\ACompClass[sub][sup][arg]` = ACompClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoACompClass[sub][sup][arg]` = CoACompClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\ACompClassE[sub][sup][arg]` = ACompClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoACompClassE[sub][sup][arg]` = CoACompClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\ACompClassH[sub][sup][arg]` = ACompClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoACompClassH[sub][sup][arg]` = CoACompClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\ACompClassC[sub][sup][arg]` = ACompClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoACompClassC[sub][sup][arg]` = CoACompClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)

- `\defcomclsgrp{CompClass}[NewClass]`;

`\CompClass[sub][sup][arg]` = NewClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoCompClass[sub][sup][arg]` = CoNewClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CompClassE[sub][sup][arg]` = NewClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoCompClassE[sub][sup][arg]` = CoNewClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CompClassH[sub][sup][arg]` = NewClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoCompClassH[sub][sup][arg]` = CoNewClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CompClassC[sub][sup][arg]` = NewClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoCompClassC[sub][sup][arg]` = CoNewClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)

`\NCompClass[sub][sup][arg]` = NNewClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoNCompClass[sub][sup][arg]` = CoNNewClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\NCompClassE[sub][sup][arg]` = NNewClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoNCompClassE[sub][sup][arg]` = CoNNewClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\NCompClassH[sub][sup][arg]` = NNewClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoNCompClassH[sub][sup][arg]` = CoNNewClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\NCompClassC[sub][sup][arg]` = NNewClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoNCompClassC[sub][sup][arg]` = CoNNewClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)

`\UCompClass[sub][sup][arg]` = UNewClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoUCompClass[sub][sup][arg]` = CoUNewClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\UCompClassE[sub][sup][arg]` = UNewClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoUCompClassE[sub][sup][arg]` = CoUNewClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\UCompClassH[sub][sup][arg]` = UNewClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoUCompClassH[sub][sup][arg]` = CoUNewClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\UCompClassC[sub][sup][arg]` = UNewClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoUCompClassC[sub][sup][arg]` = CoUNewClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)

`\ACompClass[sub][sup][arg]` = ANewClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoACompClass[sub][sup][arg]` = CoANewClass$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\ACompClassE[sub][sup][arg]` = ANewClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoACompClassE[sub][sup][arg]` = CoANewClass-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\ACompClassH[sub][sup][arg]` = ANewClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
`\CoACompClassH[sub][sup][arg]` = CoANewClass-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)

\ACompClassC[sub][sup][arg] = ANewClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
\CoACompClassC[sub][sup][arg] = CoANewClass-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)

```
\newcommandx{\defcomclsgrp}[2][2=]
  {\defcomclsgrpsem{#1}{\defval{#2}{#1}}%
  \defcomclsgrpsem{#1}{\defval{#2}{#1}}[Co]}
\newcommandx{\defcomclsgrpsem}[3][3=]
  {\defcomclsgrpred{#3#1}{#2}[#3]%
  \defcomclsgrpred{#3N#1}{#2}[#3N]%
  \defcomclsgrpred{#3U#1}{#2}[#3U]%
  \defcomclsgrpred{#3A#1}{#2}[#3A]}
\newcommandx{\defcomclsgrpred}[3][3=]
  {\defcomclsgrpcmd{#1}{#2}[#3]%
  \defcomclsgrpcmd{#1E}{#2}[#3][-easy]%
  \defcomclsgrpcmd{#1H}{#2}[#3][-hard]%
  \defcomclsgrpcmd{#1C}{#2}[#3][-complete]}%
\newcommandx{\defcomclsgrpcmd}[4][3=, 4=]
  {\csdef{#1}{\txtoargcom{#3#2#4}}}
```

`\defcomhrc` ... to do!

- `\defcomhrc{CompHierarchy}`;

  `CompHierarchy[sub][sup][par]` = CompHierarchy$^{\text{SUP}}_{\text{SUB}}$[PAR]

- `\defcomhrc{CompHierarchy}[NewHierarchy]`;

  `CompHierarchy[sub][sup][par]` = NewHierarchy$^{\text{SUP}}_{\text{SUB}}$[PAR]

```
\newcommandx{\defcomhrc}[2][2=]
  {\csdef{#1}{\txtoparcom{\defval{#2}{#1}}}}
```

```
%%*************************************************************************%%
```

`\Easy, \Hard, ...`

```
\cmdtxtcom{Easy}
\cmdtxtcom{Hard}
\cmdtxtcom{Complete}
```

```
%%*************************************************************************%%
```

`\FPT`

- `\FPT[sub][sup][arg]` = FPT$^{\text{SUP}}_{\text{SUB}}$(ARG)

```
\defcomcls{FPT}
```

```
%%*************************************************************************%%
```

`\Time, ...`

- `\Time[sub][sup][arg]` = Time$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\TimeE[sub][sup][arg]` = Time-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\TimeH[sub][sup][arg]` = Time-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\TimeC[sub][sup][arg]` = Time-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
- `\NTime[sub][sup][arg]` = NTime$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\NTimeE[sub][sup][arg]` = NTime-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\NTimeH[sub][sup][arg]` = NTime-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\NTimeC[sub][sup][arg]` = NTime-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
- `\UTime[sub][sup][arg]` = UTime$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\UTimeE[sub][sup][arg]` = UTime-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\UTimeH[sub][sup][arg]` = UTime-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\UTimeC[sub][sup][arg]` = UTime-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)
- `\ATime[sub][sup][arg]` = ATime$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\ATimeE[sub][sup][arg]` = ATime-easy$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\ATimeH[sub][sup][arg]` = ATime-hard$^{\text{SUP}}_{\text{SUB}}$(ARG)
  `\ATimeC[sub][sup][arg]` = ATime-complete$^{\text{SUP}}_{\text{SUB}}$(ARG)

```
\defcomclsgrp{Time}
```

\Space, ...

- \Space[sub][sup][arg] = $\textsc{Space}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \SpaceE[sub][sup][arg] = $\textsc{Space-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \SpaceH[sub][sup][arg] = $\textsc{Space-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \SpaceC[sub][sup][arg] = $\textsc{Space-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
- \NSpace[sub][sup][arg] = $\textsc{NSpace}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \NSpaceE[sub][sup][arg] = $\textsc{NSpace-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \NSpaceH[sub][sup][arg] = $\textsc{NSpace-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \NSpaceC[sub][sup][arg] = $\textsc{NSpace-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
- \USpace[sub][sup][arg] = $\textsc{USpace}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \USpaceE[sub][sup][arg] = $\textsc{USpace-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \USpaceH[sub][sup][arg] = $\textsc{USpace-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \USpaceC[sub][sup][arg] = $\textsc{USpace-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
- \ASpace[sub][sup][arg] = $\textsc{ASpace}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ASpaceE[sub][sup][arg] = $\textsc{ASpace-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ASpaceH[sub][sup][arg] = $\textsc{ASpace-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ASpaceC[sub][sup][arg] = $\textsc{ASpace-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$

1039 \defcomclsgrp{Space}

\LogTime, ...

- \LogTime[sub][sup][arg] = $\textsc{LogTime}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \LogTimeE[sub][sup][arg] = $\textsc{LogTime-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \LogTimeH[sub][sup][arg] = $\textsc{LogTime-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \LogTimeC[sub][sup][arg] = $\textsc{LogTime-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
- \NLogTime[sub][sup][arg] = $\textsc{NLogTime}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \NLogTimeE[sub][sup][arg] = $\textsc{NLogTime-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \NLogTimeH[sub][sup][arg] = $\textsc{NLogTime-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \NLogTimeC[sub][sup][arg] = $\textsc{NLogTime-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
- \ULogTime[sub][sup][arg] = $\textsc{ULogTime}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ULogTimeE[sub][sup][arg] = $\textsc{ULogTime-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ULogTimeH[sub][sup][arg] = $\textsc{ULogTime-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ULogTimeC[sub][sup][arg] = $\textsc{ULogTime-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
- \ALogTime[sub][sup][arg] = $\textsc{ALogTime}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ALogTimeE[sub][sup][arg] = $\textsc{ALogTime-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ALogTimeH[sub][sup][arg] = $\textsc{ALogTime-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ALogTimeC[sub][sup][arg] = $\textsc{ALogTime-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$

1040 \defcomclsgrp{LogTime}

\LogSpace, ...

- \LogSpace[sub][sup][arg] = $\textsc{LogSpace}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \LogSpaceE[sub][sup][arg] = $\textsc{LogSpace-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \LogSpaceH[sub][sup][arg] = $\textsc{LogSpace-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \LogSpaceC[sub][sup][arg] = $\textsc{LogSpace-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
- \NLogSpace[sub][sup][arg] = $\textsc{NLogSpace}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \NLogSpaceE[sub][sup][arg] = $\textsc{NLogSpace-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \NLogSpaceH[sub][sup][arg] = $\textsc{NLogSpace-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \NLogSpaceC[sub][sup][arg] = $\textsc{NLogSpace-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
- \ULogSpace[sub][sup][arg] = $\textsc{ULogSpace}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ULogSpaceE[sub][sup][arg] = $\textsc{ULogSpace-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ULogSpaceH[sub][sup][arg] = $\textsc{ULogSpace-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ULogSpaceC[sub][sup][arg] = $\textsc{ULogSpace-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
- \ALogSpace[sub][sup][arg] = $\textsc{ALogSpace}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ALogSpaceE[sub][sup][arg] = $\textsc{ALogSpace-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ALogSpaceH[sub][sup][arg] = $\textsc{ALogSpace-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \ALogSpaceC[sub][sup][arg] = $\textsc{ALogSpace-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$

1041 \defcomclsgrp{LogSpace}

\PTime, ...

- \PTime[sub][sup][arg] = $\textsc{PTime}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \PTimeE[sub][sup][arg] = $\textsc{PTime-easy}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \PTimeH[sub][sup][arg] = $\textsc{PTime-hard}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$
  \PTimeC[sub][sup][arg] = $\textsc{PTime-complete}^{\textsc{sup}}_{\textsc{sub}}(\textsc{arg})$

- `\NPTime[sub][sup][arg]` = $\mathrm{NPTIME}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NPTimeE[sub][sup][arg]` = $\mathrm{NPTIME\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NPTimeH[sub][sup][arg]` = $\mathrm{NPTIME\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NPTimeC[sub][sup][arg]` = $\mathrm{NPTIME\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
- `\UPTime[sub][sup][arg]` = $\mathrm{UPTIME}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\UPTimeE[sub][sup][arg]` = $\mathrm{UPTIME\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\UPTimeH[sub][sup][arg]` = $\mathrm{UPTIME\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\UPTimeC[sub][sup][arg]` = $\mathrm{UPTIME\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
- `\APTime[sub][sup][arg]` = $\mathrm{APTIME}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\APTimeE[sub][sup][arg]` = $\mathrm{APTIME\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\APTimeH[sub][sup][arg]` = $\mathrm{APTIME\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\APTimeC[sub][sup][arg]` = $\mathrm{APTIME\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$

1042 `\defcomclsgrp{PTime}`

`\PSpace, ...`

- `\PSpace[sub][sup][arg]` = $\mathrm{PSPACE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\PSpaceE[sub][sup][arg]` = $\mathrm{PSPACE\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\PSpaceH[sub][sup][arg]` = $\mathrm{PSPACE\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\PSpaceC[sub][sup][arg]` = $\mathrm{PSPACE\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
- `\NPSpace[sub][sup][arg]` = $\mathrm{NPSPACE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NPSpaceE[sub][sup][arg]` = $\mathrm{NPSPACE\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NPSpaceH[sub][sup][arg]` = $\mathrm{NPSPACE\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NPSpaceC[sub][sup][arg]` = $\mathrm{NPSPACE\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
- `\UPSpace[sub][sup][arg]` = $\mathrm{UPSPACE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\UPSpaceE[sub][sup][arg]` = $\mathrm{UPSPACE\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\UPSpaceH[sub][sup][arg]` = $\mathrm{UPSPACE\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\UPSpaceC[sub][sup][arg]` = $\mathrm{UPSPACE\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
- `\APSpace[sub][sup][arg]` = $\mathrm{APSPACE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\APSpaceE[sub][sup][arg]` = $\mathrm{APSPACE\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\APSpaceH[sub][sup][arg]` = $\mathrm{APSPACE\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\APSpaceC[sub][sup][arg]` = $\mathrm{APSPACE\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$

1043 `\defcomclsgrp{PSpace}`

`\QPTime, ...`

- `\QPTime[sub][sup][arg]` = $\mathrm{QPTIME}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\QPTimeE[sub][sup][arg]` = $\mathrm{QPTIME\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\QPTimeH[sub][sup][arg]` = $\mathrm{QPTIME\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\QPTimeC[sub][sup][arg]` = $\mathrm{QPTIME\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
- `\NQPTime[sub][sup][arg]` = $\mathrm{NQPTIME}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NQPTimeE[sub][sup][arg]` = $\mathrm{NQPTIME\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NQPTimeH[sub][sup][arg]` = $\mathrm{NQPTIME\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NQPTimeC[sub][sup][arg]` = $\mathrm{NQPTIME\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
- `\UQPTime[sub][sup][arg]` = $\mathrm{UQPTIME}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\UQPTimeE[sub][sup][arg]` = $\mathrm{UQPTIME\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\UQPTimeH[sub][sup][arg]` = $\mathrm{UQPTIME\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\UQPTimeC[sub][sup][arg]` = $\mathrm{UQPTIME\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
- `\AQPTime[sub][sup][arg]` = $\mathrm{AQPTIME}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\AQPTimeE[sub][sup][arg]` = $\mathrm{AQPTIME\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\AQPTimeH[sub][sup][arg]` = $\mathrm{AQPTIME\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\AQPTimeC[sub][sup][arg]` = $\mathrm{AQPTIME\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$

1044 `\defcomclsgrp{QPTime}`

`\QPSpace, ...`

- `\QPSpace[sub][sup][arg]` = $\mathrm{QPSPACE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\QPSpaceE[sub][sup][arg]` = $\mathrm{QPSPACE\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\QPSpaceH[sub][sup][arg]` = $\mathrm{QPSPACE\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\QPSpaceC[sub][sup][arg]` = $\mathrm{QPSPACE\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
- `\NQPSpace[sub][sup][arg]` = $\mathrm{NQPSPACE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NQPSpaceE[sub][sup][arg]` = $\mathrm{NQPSPACE\text{-}EASY}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NQPSpaceH[sub][sup][arg]` = $\mathrm{NQPSPACE\text{-}HARD}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$
  `\NQPSpaceC[sub][sup][arg]` = $\mathrm{NQPSPACE\text{-}COMPLETE}^{\mathrm{SUP}}_{\mathrm{SUB}}(\mathrm{ARG})$

- `\UQPSpace[sub][sup][arg]` = $\mathrm{UQPSpace}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\UQPSpaceE[sub][sup][arg]` = $\mathrm{UQPSpace\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\UQPSpaceH[sub][sup][arg]` = $\mathrm{UQPSpace\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\UQPSpaceC[sub][sup][arg]` = $\mathrm{UQPSpace\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
- `\AQPSpace[sub][sup][arg]` = $\mathrm{AQPSpace}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\AQPSpaceE[sub][sup][arg]` = $\mathrm{AQPSpace\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\AQPSpaceH[sub][sup][arg]` = $\mathrm{AQPSpace\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\AQPSpaceC[sub][sup][arg]` = $\mathrm{AQPSpace\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$

1045 `\defcomclsgrp{QPSpace}`

`\ExpTime, ...`

- `\ExpTime[sub][sup][arg]` = $\mathrm{ExpTime}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\ExpTimeE[sub][sup][arg]` = $\mathrm{ExpTime\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\ExpTimeH[sub][sup][arg]` = $\mathrm{ExpTime\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\ExpTimeC[sub][sup][arg]` = $\mathrm{ExpTime\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
- `\NExpTime[sub][sup][arg]` = $\mathrm{NExpTime}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\NExpTimeE[sub][sup][arg]` = $\mathrm{NExpTime\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\NExpTimeH[sub][sup][arg]` = $\mathrm{NExpTime\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\NExpTimeC[sub][sup][arg]` = $\mathrm{NExpTime\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
- `\UExpTime[sub][sup][arg]` = $\mathrm{UExpTime}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\UExpTimeE[sub][sup][arg]` = $\mathrm{UExpTime\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\UExpTimeH[sub][sup][arg]` = $\mathrm{UExpTime\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\UExpTimeC[sub][sup][arg]` = $\mathrm{UExpTime\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
- `\AExpTime[sub][sup][arg]` = $\mathrm{AExpTime}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\AExpTimeE[sub][sup][arg]` = $\mathrm{AExpTime\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\AExpTimeH[sub][sup][arg]` = $\mathrm{AExpTime\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\AExpTimeC[sub][sup][arg]` = $\mathrm{AExpTime\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$

1046 `\defcomclsgrp{ExpTime}`

`\ExpSpace, ...`

- `\ExpSpace[sub][sup][arg]` = $\mathrm{ExpSpace}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\ExpSpaceE[sub][sup][arg]` = $\mathrm{ExpSpace\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\ExpSpaceH[sub][sup][arg]` = $\mathrm{ExpSpace\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\ExpSpaceC[sub][sup][arg]` = $\mathrm{ExpSpace\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
- `\NExpSpace[sub][sup][arg]` = $\mathrm{NExpSpace}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\NExpSpaceE[sub][sup][arg]` = $\mathrm{NExpSpace\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\NExpSpaceH[sub][sup][arg]` = $\mathrm{NExpSpace\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\NExpSpaceC[sub][sup][arg]` = $\mathrm{NExpSpace\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
- `\UExpSpace[sub][sup][arg]` = $\mathrm{UExpSpace}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\UExpSpaceE[sub][sup][arg]` = $\mathrm{UExpSpace\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\UExpSpaceH[sub][sup][arg]` = $\mathrm{UExpSpace\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\UExpSpaceC[sub][sup][arg]` = $\mathrm{UExpSpace\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
- `\AExpSpace[sub][sup][arg]` = $\mathrm{AExpSpace}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\AExpSpaceE[sub][sup][arg]` = $\mathrm{AExpSpace\text{-}easy}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\AExpSpaceH[sub][sup][arg]` = $\mathrm{AExpSpace\text{-}hard}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$
  `\AExpSpaceC[sub][sup][arg]` = $\mathrm{AExpSpace\text{-}complete}_{\mathrm{SUB}}^{\mathrm{SUP}}(\mathrm{ARG})$

1047 `\defcomclsgrp{ExpSpace}`

1048 `%%**************************************************************************%%`

`\PH`

- `\PH[sub][sup][par]` = $\mathrm{PH}_{\mathrm{SUB}}^{\mathrm{SUP}}[\mathrm{PAR}]$

1049 `\defcomhrc{PH}`

`\WH`

- `\WH[sub][sup][par]` = $\mathrm{W}_{\mathrm{SUB}}^{\mathrm{SUP}}[\mathrm{PAR}]$

1050 `\defcomhrc{WH}[W]`

`\AH`

- `\AH[sub][sup][par]` = $\mathrm{A}_{\mathrm{SUB}}^{\mathrm{SUP}}[\mathrm{PAR}]$

1051 `\defcomhrc{AH}[A]`

`\DLH, \DBH`

- `\DLH[sub][sup][par]` = $\Delta_{\mathrm{SUB}}^{\mathrm{SUP}}[\mathrm{PAR}]$

- \DBH[sub][sup][par] = $\mathbf{\Delta}^{\mathrm{SUP}}_{\mathrm{SUB}}[\mathrm{PAR}]$

```
\defcomhrc{DLH}[{\mth{\Delta}}]
\defcomhrc{DBH}[{\mth[mathbf]{\Delta}}]
```

\ELH, \EBH

- \ELH[sub][sup][par] = $\Sigma^{\mathrm{SUP}}_{\mathrm{SUB}}[\mathrm{PAR}]$
- \EBH[sub][sup][par] = $\mathbf{\Sigma}^{\mathrm{SUP}}_{\mathrm{SUB}}[\mathrm{PAR}]$

```
\defcomhrc{ELH}[{\mth{\Sigma}}]
\defcomhrc{EBH}[{\mth[mathbf]{\Sigma}}]
```

\ULH, \UBH

- \ULH[sub][sup][par] = $\Pi^{\mathrm{SUP}}_{\mathrm{SUB}}[\mathrm{PAR}]$
- \UBH[sub][sup][par] = $\mathbf{\Pi}^{\mathrm{SUP}}_{\mathrm{SUB}}[\mathrm{PAR}]$

```
\defcomhrc{ULH}[{\mth{\Pi}}]
\defcomhrc{UBH}[{\mth[mathbf]{\Pi}}]

\fi
%%*****************************************************************************%%
%%*****************************************************************************%%
%%** Macros for Games ***********************************************************%%
%%*****************************************************************************%%
\ifgam@
%%** Logic Games ***************************************************************%%
```

\SATG, ...

```
%% Satisfiability Games
\cmdtxtoparname{SATG}[Sat]

%% Validity Games
\cmdtxtoparname{VALG}[Val]

%% Evaluation Games
\cmdtxtoparname{EVLG}[Evl]

%% Synthesis Games
\cmdtxtoparname{SYNG}[Syn]

%% Model-Checking Games
\cmdtxtoparname{MCG}[MC]

%% Ehrenfeucht-Fraisse Games
\cmdtxtoparname{EFG}[EF]

%%** Syntax ********************************************************************%%
```

\PlrSym, \OppSym ...

```
\newcommand{\plrsym}{E}
\cmdmthsym{Plr}[\plrsym]
\newcommand{\oppsym}{A}
\cmdmthsym{Opp}[\oppsym]
```

\ArenaName, ...

```
\newcommand{\arenaname}{A}
\usrmthlatupp{Arena}{Name}{name}[\arenaname]
```

\PosSet, ...

```
\newcommand{\possym}{v}
\newcommand{\posset}{Ps}
\cmdmthsetext{Pos}[\posset][\possym]
\cmdmthsymelm{ipos}[\possym_{I}]
\cmdmthsymelm{fpos}[\possym_{F}]
\cmdmthset{PPos}[\posset_{\PlrSym}]
\cmdmthsymelm{ppos}[\possym_{\PlrSym}]
\cmdmthset{OPos}[\posset_{\OppSym}]
\cmdmthsymelm{opos}[\possym_{\OppSym}]
```

```
        \PlrFun  ...
                 \newcommand{\plrfun}{pl}
                 \cmdmthfun{plr}[\plrfun]

        \MovRel  ...
                 \newcommand{\movrel}{Mv}
                 \cmdmthrel{Mov}[\movrel]

  \GameName, ...  ...
                 \newcommand{\gamename}{\Game}
                 \usrmthlatupp{Game}{Name}{name}[\gamename]

        \WinSet  ...
                 \newcommand{\winset}{Wn}
                 \cmdmthset{Win}[\winset]

\ObsSet, \obsFun  ...
                 \newcommand{\obsset}{Ob}
                 \cmdmthset{Obs}[\obsset]
                 \cmdmthfun{obs}

                 %%** Semantics ****************************************************************%%

\PthSet, \pthFun  ...
                 \newcommand{\pthsym}{\pi}
                 \newcommand{\pthset}{Pth}
                 \cmdmthsetext{Pth}[\pthset][\pthsym]
                 \cmdmthfun{pth}

    \HstSet, ...  ...
                 \newcommand{\hstsym}{\rho}
                 \newcommand{\hstset}{Hst}
                 \cmdmthsetext{Hst}[\hstset][\hstsym]
                 \cmdmthset{PHst}[\hstset_{\PlrSym}]
                 \cmdmthsymelm{phst}[\hstsym_{\PlrSym}]
                 \cmdmthset{OHst}[\hstset_{\OppSym}]
                 \cmdmthsymelm{ohst}[\hstsym_{\OppSym}]
                 \cmdmthfun{hst}

\PlaySet,\playFun  ...
                 \newcommand{\playsym}{\pi}
                 \newcommand{\playset}{Play}
                 \cmdmthsetext{Play}[\playset][\playsym]
                 \cmdmthfun{play}

    \StrSet, ...  ...
                 \newcommand{\strsym}{\sigma}
                 \newcommand{\strset}{Str}
                 \cmdmthsetext{Str}[\strset][\strsym]
                 \cmdmthset{PStr}[\strset_{\PlrSym}]
                 \cmdmthsymelm{pstr}[\strsym_{\PlrSym}]
                 \cmdmthset{OStr}[\strset_{\OppSym}]
                 \cmdmthsymelm{ostr}[\strsym_{\OppSym}]

\PrfSet, \prfFun  ...
                 \newcommand{\prfsym}{\xi}
                 \newcommand{\prfset}{Prf}
                 \cmdmthsetext{Prf}[\prfset][\prfsym]

\preFun, \sucFun  ...
                 \newcommand{\prefun}{pre}
                 \cmdmthoargfun{pre}[\prefun]
                 \newcommand{\sucfun}{suc}
                 \cmdmthoargfun{suc}[\sucfun]
```

\entFun, \escFun ...

```
\newcommand{\entfun}{ent}
\cmdmthoargfun{ent}[\entfun]
\newcommand{\escfun}{esc}
\cmdmthoargfun{esc}[\escfun]
```

\intFun, \outFun ...

```
\newcommand{\intfun}{int}
\cmdmthoargfun{int}[\intfun]
\newcommand{\outfun}{out}
\cmdmthoargfun{out}[\outfun]
```

\atrFun, \rchFun ...

```
\newcommand{\atrfun}{atr}
\cmdmthoargfun{atr}[\atrfun]
\newcommand{\rchfun}{rch}
\cmdmthoargfun{rch}[\rchfun]
```

\liftFun ...

```
\newcommand{\liftfun}{lift}
\cmdmthoargfun{lift}[\liftfun]
```

\solFun ...

```
\newcommand{\solfun}{sol}
\cmdmthoargfun{sol}[\solfun]

%%** Qualitative Games on Graph ************************************************%%
```

\BG, ...

```
%% Buchi Games
\cmdtxtoparname{BG}

%% Co-Buchi Games
\cmdtxtoparname{CG}

%% Parity Games
\cmdtxtoparname{PG}

%% Rabin Games
\cmdtxtoparname{RG}

%% Streett Games
\cmdtxtoparname{SG}

%% Muller Games
\cmdtxtoparname{MG}

%%** Syntax *********************************************************************%%
```

\EvnSym, \OddSym ...

```
\newcommand{\evnsym}{0}
\cmdmthsym{Evn}[\evnsym]
\newcommand{\oddsym}{1}
\cmdmthsym{Odd}[\oddsym]
```

\PrtSet, \prtFun ...

```
\newcommand{\prtsym}{p}
\newcommand{\prtset}{Pr}
\cmdmthsetext{Prt}[\prtset][\prtsym]
\cmdmthfun{prt}[pr]

%%** Semantics ******************************************************************%%
```

…

```
%%** Quantitative Games on Graph *********************************************%%
```

\EG, ... …

```
%% Energy Games
\cmdtxtoparname{EG}

%% Mean-Payoff Games
\cmdtxtoparname{MPG}

%% Discounted-Payoff Games
\cmdtxtoparname{DPG}
```

```
%%** Syntax ******************************************************************%%
```

\MaxSym, \MinSym …

```
\newcommand{\maxsym}{\oplus}
\cmdmthsym{Max}[\maxsym]
\newcommand{\minsym}{\boxminus}
\cmdmthsym{Min}[\minsym]
```

\WghSet, \wghFun …

```
\newcommand{\wghsym}{w}
\newcommand{\wghset}{Wg}
\cmdmthsetext{Wgh}[\wghset][\wghsym]
\cmdmthfun{wgh}[wg]
```

```
%%** Semantics ***************************************************************%%
```

…

```
\fi
%%****************************************************************************%%
```

```
%%****************************************************************************%%
%%** Macros for Logics *******************************************************%%
%%****************************************************************************%%
\iflog@
```

```
%%** Propositional Logics ****************************************************%%
```

\BF, \QBF, ... …

```
% Boolean Formulae
\cmdtxtoparname{BF}

% Quantified Boolean Formulae
\DeclareRobustCommand{\QBF}
  {{\txtname{Q}}\BF}
\DeclareRobustCommand{\EBF}
  {\ensuremath{\exists}\BF}
\DeclareRobustCommand{\UBF}
  {\ensuremath{\forall}\BF}
```

```
%%** Syntax ******************************************************************%%
```

\LogSig, ... …

```
\newcommand{\logsig}{L}
\usrmthlatupp{Log}{Sig}{sig}[\logsig]
```

\Tt, \Ff …

```
\newcommand{\ttsym}{\top}
\usrmth{Tt}{}{sym}[\ttsym]
\newcommand{\ffsym}{\bot}
\usrmth{Ff}{}{sym}[\ffsym]
```

```
\LNeg, \LNot  ...
1227 \newcommand{\lnegsym}{\neg}
1228 \usrmth{LNeg}{}{luop}[\lnegsym]
1229 \newcommand{\lnotsym}{\sim}
1230 \usrmth{LNot}{}{luop}[\lnotsym]

\LCon, \LDis  ...
1231 \newcommand{\lconsym}{\land}
1232 \usrmth{LCon}{}{lbop}[\lconsym]
1233 \newcommand{\ldissym}{\lor}
1234 \usrmth{LDis}{}{lbop}[\ldissym]

\LImp, \LCoi  ...
1235 \newcommand{\limpsym}{\rightarrow}
1236 \usrmth{LImp}{}{lbop}[\limpsym]
1237 \newcommand{\lcoisym}{\leftrightarrow}
1238 \usrmth{LCoi}{}{lbop}[\lcoisym]

\LExs, \LAll  ...
1239 \newcommand{\lexssym}{\exists}
1240 \usrmth{LExs}{}{luop}[\lexssym]
1241 \newcommand{\lallsym}{\forall}
1242 \usrmth{LAll}{}{luop}[\lallsym]

 \APSet, ...  ...
1243 \newcommand{\apsym}{p}
1244 \newcommand{\apset}{AP}
1245 \cmdmthsetext{AP}[\apset][\apsym]
1246 \cmdmthfun{ap}\usrmth{ap}{}{argfun}

       \sub  ...
1247 \usrmth{sub}{}{argfun}

\Cnt, \Qnt, \Sym  ...
1248 \usrmth{Cnt}{}{sym}[C]
1249 \usrmth{Qnt}{}{sym}[Q]
1250 \usrmth{Sym}{}{sym}[\odot]

  \QAE, \QEA  ...
1251 \usrmth{QAE}{}{sym}[\forall\exists]
1252 \usrmth{QEA}{}{sym}[\exists\forall]

\QntSet, ...  ...
1253 \newcommand{\qntsym}{\wp}
1254 \newcommand{\qntset}{Qn}
1255 \cmdmthsetext{Qnt}[\qntset][\qntsym]

\free, \bound  ...
1256 \usrmth{free}{}{argfun}
1257 \usrmth{bound}{}{argfun}

  \dep, \alt  ...
1258 \usrmth{dep}{}{argfun}
1259 \usrmth{alt}{}{argfun}

\cnf, \dnf, ...  ...
1260 \cmdtxtabr{cnf}
1261 \cmdtxtabr{dnf}
1262 \cmdtxtabr{pnf}
1263 \cmdtxtabr{nnf}

1264 %%** Semantics ****************************************************************%%
```

```
\LogStr, ...  ...
1265 \newcommand{\logstr}{L}
1266 \usrmthlatupp{Log}{Str}{str}[\logstr]

\ValSet, ...  ...
1267 \newcommand{\valsym}{\xi}
1268 \newcommand{\valset}{Val}
1269 \cmdmthsetext{Val}[\valset][\valsym]

\AsgSet, ...  ...
1270 \newcommand{\asgsym}{\chi}
1271 \newcommand{\asgset}{Asg}
1272 \cmdmthsetext{Asg}[\asgset][\asgsym]

1273 %%** First-Order Logics I ***************************************************%%

   \FOL, ...  ...
1274 % First-Order Logic
1275 \cmdtxtoparname{FOL}[Fol]
1276 \cmdtxtoparname{FO}[FO]
1277
1278 % Monadic First-Order Logic
1279 \DeclareRobustCommand{\MFOL}
1280   {{\txtname{M}}\FOL}
1281 \DeclareRobustCommand{\MFO}
1282   {{\txtname{M}}\FO}

1283 %%** Syntax ******************************************************************%%

\VarSig, ...  ...
1284 \newcommand{\varsig}{V}
1285 \usrmthlatupp{Var}{Sig}{sig}[\varsig]
1286 \newcommand{\varsym}{x}
1287 \newcommand{\varset}{Vr}
1288 \cmdmthsetext{Var}[\varset][\varsym]
1289 \usrmth{var}{}{argfun}[vr]
1290 \cmdmthfun{dim}[dm]\usrmth{dim}{}{argfun}[dm]

\ConSig, ...  ...
1291 \newcommand{\consig}{C}
1292 \usrmthlatupp{Con}{Sig}{sig}[\consig]
1293 \newcommand{\consym}{c}
1294 \newcommand{\conset}{Cn}
1295 \cmdmthsetext{Con}[\conset][\consym]
1296 \usrmth{con}{}{argfun}[cn]

\FunSig, ...  ...
1297 \newcommand{\funsig}{F}
1298 \usrmthlatupp{Fun}{Sig}{sig}[\funsig]
1299 \newcommand{\funsym}{f}
1300 \newcommand{\funset}{Fn}
1301 \cmdmthsetext{Fun}[\funset][\funsym]
1302 \usrmth{fun}{}{argfun}[fn]
1303 \cmdmthfun{art}[ar]\usrmth{art}{}{argfun}[ar]

\TerSig, ...  ...
1304 \newcommand{\tersig}{T}
1305 \usrmthlatupp{Ter}{Sig}{sig}[\tersig]
1306 \newcommand{\tersym}{t}
1307 \newcommand{\terset}{Tr}
1308 \cmdmthsetext{Ter}[\terset][\tersym]
1309 \usrmth{ter}{}{argfun}
```

```
\RelSig, ...  ...
1310 \newcommand{\relsig}{R}
1311 \usrmthlatupp{Rel}{Sig}{sig}[\relsig]
1312 \newcommand{\relsym}{r}
1313 \newcommand{\relset}{Rl}
1314 \cmdmthsetext{Rel}[\relset][\relsym]
1315 \usrmth{rel}{}{argfun}[rl]

      \skm  ...
1316 \usrmth{skm}{}{argfun}

1317 %%** Semantics ****************************************************************%%

\ConStr, ...  ...
1318 \newcommand{\constr}{C}
1319 \usrmthlatupp{Con}{Str}{str}[\constr]

\FunStr, ...  ...
1320 \newcommand{\funstr}{F}
1321 \usrmthlatupp{Fun}{Str}{str}[\funstr]

\TerStr, ...  ...
1322 \newcommand{\terstr}{T}
1323 \usrmthlatupp{Ter}{Str}{str}[\terstr]

\RelStr, ...  ...
1324 \newcommand{\relstr}{R}
1325 \usrmthlatupp{Rel}{Str}{str}[\relstr]

1326 %%** First-Order Logics II ****************************************************%%

\DF, \IF, ...  ...
1327 % Dependence-Friendly Logic
1328 \cmdtxtoparname{DF}
1329
1330 % Independence-Friendly Logic
1331 \cmdtxtoparname{IF}
1332
1333 % Dependence/Independence-Friendly Logic
1334 \cmdtxtoparname{DIF}
1335
1336 % Dependence Logic
1337 \cmdtxtoparname{DL}
1338
1339 % Team Logic
1340 \cmdtxtoparname{TL}
1341
1342 % Alternating Dependence-Friendly Logic
1343 \cmdtxtoparname{ADF}
1344
1345 % Alternating Independence-Friendly Logic
1346 \cmdtxtoparname{AIF}
1347
1348 % Alternating Dependence/Independence-Friendly Logic
1349 \cmdtxtoparname{ADIF}

    ...
1350 %%** Syntax ********************************************************************%%

\LEExs, \LAAll  ...
1351 \newcommand{\leexssym}{\Sigma}
1352 \usrmth{LEExs}{}{luop}[\leexssym]
1353 \newcommand{\laallsym}{\Pi}
1354 \usrmth{LAAll}{}{luop}[\laallsym]
```

```
%%** Semantics ***************************************************************%%
```

...

```
%%** Second-Order Logics I **************************************************%%
```

\SOL, ...

```
% Second-Order Logic
\cmdtxtoparname{SOL}[Sol]
\cmdtxtoparname{SO}

% Weak Second-Order Logic
\DeclareRobustCommand{\WSOL}
  {{\txtname{W}}\SOL}
\DeclareRobustCommand{\WSO}
  {{\txtname{W}}\SO}

% coWeak Second-Order Logic
\DeclareRobustCommand{\coWSOL}
  {{\txtname{coW}}\SOL}
\DeclareRobustCommand{\coWSO}
  {{\txtname{coW}}\SO}

% Monadic Second-Order Logic
\DeclareRobustCommand{\MSOL}
  {{\txtname{M}}\SOL}
\DeclareRobustCommand{\MSO}
  {{\txtname{M}}\SO}

% Weak Monadic Second-Order Logic
\DeclareRobustCommand{\WMSOL}
  {{\txtname{W}}\MSOL}
\DeclareRobustCommand{\WMSO}
  {{\txtname{W}}\MSO}

% coWeak Monadic Second-Order Logic
\DeclareRobustCommand{\coWMSOL}
  {{\txtname{coW}}\MSOL}
\DeclareRobustCommand{\coWMSO}
  {{\txtname{coW}}\MSO}
```

```
%%** Syntax ******************************************************************%%
```

\FVarSet, ...

```
\newcommand{\fvarsym}{x}
\newcommand{\fvarset}{FVr}
\cmdmthsetext{FVar}[\fvarset][\fvarsym]
```

\SVarSet, ...

```
\newcommand{\svarsym}{X}
\newcommand{\svarset}{SVr}
\cmdmthsetext{SVar}[\svarset][\svarsym]
```

```
%%** Semantics ***************************************************************%%
```

...

```
%%** Second-Order Logics II *************************************************%%
```

\TL, \PL, ...

```
% Tree Logic
\cmdtxtoparname{TL}

% Weak Tree Logic
\DeclareRobustCommand{\WTL}
  {{\txtname{W}}\TL}
```

```
1405
1406 % coWeak Tree Logic
1407 \DeclareRobustCommand{\coWTL}
1408   {{\txtname{coW}}\TL}
1409
1410 % Monadic Tree Logic
1411 \DeclareRobustCommand{\MTL}
1412   {{\txtname{M}}\TL}
1413
1414 % Weak Monadic Tree Logic
1415 \DeclareRobustCommand{\WMTL}
1416   {{\txtname{W}}\MTL}
1417
1418 % coWeak Monadic Tree Logic
1419 \DeclareRobustCommand{\coWMTL}
1420   {{\txtname{coW}}\MTL}
1421
1422 % Path Logic
1423 \cmdtxtoparname{PL}
1424
1425 % Weak Path Logic
1426 \DeclareRobustCommand{\WPL}
1427   {{\txtname{W}}\PL}
1428
1429 % coWeak Path Logic
1430 \DeclareRobustCommand{\coWPL}
1431   {{\txtname{coW}}\PL}
1432
1433 % Monadic Path Logic
1434 \DeclareRobustCommand{\MPL}
1435   {{\txtname{M}}\PL}
1436
1437 % Weak Monadic Path Logic
1438 \DeclareRobustCommand{\WMPL}
1439   {{\txtname{W}}\MPL}
1440
1441 % coWeak Monadic Path Logic
1442 \DeclareRobustCommand{\coWMPL}
1443   {{\txtname{coW}}\MPL}

1444 %%** Syntax ************************************************************%%

   ...

1445 %%** Semantics *********************************************************%%

   ...

1446 %%** Modal Logics I *****************************************************%%

\ML, \GML, ...  ...
1447 % Modal Logic
1448 \cmdtxtoparname{ML}
1449
1450 % Graded Modal Logic
1451 \DeclareRobustCommand{\GML}
1452   {{\txtname{G}}\ML}
1453
1454 % Quantified Modal Logic
1455 \DeclareRobustCommand{\QML}
1456   {{\txtname{Q}}\ML}
1457 \DeclareRobustCommand{\EML}
1458   {\ensuremath{\exists}\ML}
1459 \DeclareRobustCommand{\UML}
1460   {\ensuremath{\forall}\ML}
```

```
%%** Syntax ********************************************************************%%

          \Opr  ...
\usrmth{Opr}{}{sym}[Op]

    \DMod, \BMod  ...
\usrmth{DMod}{}{sym}[\Diamond]
\usrmth{BMod}{}{sym}[\Box]

      \Exs, \All  ...
\DeclareRobustCommand{\Exs}[1]
  {\mth{\defval{\argmid{\langle}{#1}{\rangle}}{\DMod}}}
\DeclareRobustCommand{\All}[1]
  {\mth{\defval{\argmid{\left[}{#1}{\right]}}{\BMod}}}

%%** Semantics *********************************************************************%%

    \KrpStr, ...  ...
\newcommand{\krpstr}{K}
\usrmthlatupp{Krp}{Str}{str}[\krpstr]

    \WrlSet, ...  ...
\newcommand{\wrlsym}{w}
\newcommand{\wrlset}{W}
\cmdmthsetext{Wrl}[\wrlset][\wrlsym]
\cmdmthsymelm{iwrl}[\wrlsym_{I}]

\AccRel, \TrnRel  ...
\newcommand{\accsym}{R}
\cmdmthrel{Acc}[\accsym]
\cmdmthrel{Trn}[\accsym]

         \labFun  ...
\newcommand{\labsym}{\lambda}
\cmdmthfun{lab}[\labsym]

\PthSet, \pthFun  ...
\providecommand{\pthsym}{\pi}
\providecommand{\pthset}{Pth}
\cmdmthsetext{Pth}[\pthset][\pthsym]
\cmdmthfun{pth}

%%** Modal Logics II ***************************************************************%%

  \MC, \GMC, ...  ...
% Mu Calculus
\cmdtxtoparname{MC}[\ensuremath{\mu}-Calculus]

% Graded Mu Calculus
\DeclareRobustCommand{\GMC}
  {{\txtname{G}}\MC}

% Quantified Mu Calculus
\DeclareRobustCommand{\QMC}
  {{\txtname{Q}}\MC}
\DeclareRobustCommand{\EMC}
  {\ensuremath{\exists}\MC}
\DeclareRobustCommand{\UMC}
  {\ensuremath{\forall}\MC}

% Alternation-Free Mu Calculus
\DeclareRobustCommand{\AFMC}
  {{\txtname{AF}}\MC}
```

```
1504
1505 % Alternation-Free Graded Mu Calculus
1506 \DeclareRobustCommand{\AFGMC}
1507   {{\txtname{AF}}\GMC}
1508
1509 % Quantified Alternation-Free Mu Calculus
1510 \DeclareRobustCommand{\QAFMC}
1511   {{\txtname{Q}}\AFMC}
1512 \DeclareRobustCommand{\EAFMC}
1513   {\ensuremath{\exists}\AFMC}
1514 \DeclareRobustCommand{\UAFMC}
1515   {\ensuremath{\forall}\AFMC}
1516
1517 %%** Syntax *************************************************************%%
    ...
1518 %%** Semantics **********************************************************%%
    ...
1519 %%** Temporal Logics I ***************************************************%%
```

\PTL, \LTL, ...

```
1520 % Propositional Temporal Logic
1521 \cmdtxtoparname{PTL}
1522
1523 % Quantified Propositional Temporal Logic
1524 \DeclareRobustCommand{\QPTL}
1525   {{\txtname{Q}}\PTL}
1526 \DeclareRobustCommand{\EPTL}
1527   {\ensuremath{\exists}\PTL}
1528 \DeclareRobustCommand{\UPTL}
1529   {\ensuremath{\forall}\PTL}
1530
1531 % Linear Temporal Logic
1532 \cmdtxtoparname{LTL}
1533
1534 % Quantified Linear Temporal Logic
1535 \DeclareRobustCommand{\QLTL}
1536   {{\txtname{Q}}\LTL}
1537 \DeclareRobustCommand{\ELTL}
1538   {\ensuremath{\exists}\LTL}
1539 \DeclareRobustCommand{\ULTL}
1540   {\ensuremath{\forall}\LTL}
1541 %%** Syntax *************************************************************%%
```

\X, ...

```
1542 \usrmth{X}{}{sym}[X\,]
1543 \usrmth{F}{}{sym}[F\,]
1544 \usrmth{G}{}{sym}[G\,]
1545 \usrmth{U}{}{sym}[\,U\,]
1546 \usrmth{R}{}{sym}[\,R\,]
```

\Y, ...

```
1547 \usrmth{Y}{}{sym}[G\,]
1548 \usrmth{P}{}{sym}[P\,]\let\SavePilcrow\P
1549 \usrmth{H}{}{sym}[H\,]\let\SaveDoubleAcute\H
1550 \usrmth{S}{}{sym}[\,S\,]\let\SaveSectionSymbol\S
1551 \usrmth{B}{}{sym}[\,B\,]

1552 %%** Semantics **********************************************************%%
    ...
1553 %%** Temporal Logics II **************************************************%%
```

\PDL, \CTL, ...

```
1554
1555 % Propositional Dynamic Logic
1556 \cmdtxtoparname{PDL}
1557
1558 % Computation Tree Logic
1559 \cmdtxtoparname{CTL}
1560
1561 % Weak Computation Tree Logic
1562 \DeclareRobustCommand{\WCTL}
1563   {{\txtname{W}}\CTL}
1564
1565 % Quantified Computation Tree Logic
1566 \DeclareRobustCommand{\QCTL}
1567   {{\txtname{Q}}\CTL}
1568 \DeclareRobustCommand{\ECTL}
1569   {\ensuremath{\exists}\CTL}
1570 \DeclareRobustCommand{\UCTL}
1571   {\ensuremath{\forall}\CTL}
1572
1573 % Improved Computation Tree Logic
1574 \cmdtxtoparname{CTLP}[CTL$^{+}$]
1575
1576 % Weak Improved Computation Tree Logic
1577 \DeclareRobustCommand{\WCTLP}
1578   {{\txtname{W}}\CTLP}
1579
1580 % Quantified Improved Computation Tree Logic
1581 \DeclareRobustCommand{\QCTLP}
1582   {{\txtname{Q}}\CTLP}
1583 \DeclareRobustCommand{\ECTLP}
1584   {\ensuremath{\exists}\CTLP}
1585 \DeclareRobustCommand{\UCTLP}
1586   {\ensuremath{\forall}\CTLP}
1587
1588 % Full Computation Tree Logic
1589 \cmdtxtoparname{CTLS}[CTL*]
1590
1591 % Weak Full Computation Tree Logic
1592 \DeclareRobustCommand{\WCTLS}
1593   {{\txtname{W}}\CTLS}
1594
1595 % Quantified Full Computation Tree Logic
1596 \DeclareRobustCommand{\QCTLS}
1597   {{\txtname{Q}}\CTLS}
1598 \DeclareRobustCommand{\ECTLS}
1599   {\ensuremath{\exists}\CTLS}
1600 \DeclareRobustCommand{\UCTLS}
1601   {\ensuremath{\forall}\CTLS}
```

```
1602 %%** Syntax ************************************************************%%
```

\E, \A ...

```
1603 \usrmth{E}{}{sym}
1604 \usrmth{A}{}{sym}
```

```
1605 %%** Semantics **********************************************************%%
```

...

```
1606 %%** Strategic Logics I ***********************************************%%
```

\ATL, ...

```
1607 % Alternating Temporal Logic
1608 \cmdtxtoparname{ATL}
```

```
1609
1610 % Weak Alternating Tree Logic
1611 \DeclareRobustCommand{\WATL}
1612   {{\txtname{W}}\ATL}
1613
1614 % Quantified Alternating Temporal Logic
1615 \DeclareRobustCommand{\QATL}
1616   {{\txtname{Q}}\ATL}
1617 \DeclareRobustCommand{\EATL}
1618   {\ensuremath{\exists}\ATL}
1619 \DeclareRobustCommand{\UATL}
1620   {\ensuremath{\forall}\ATL}
1621
1622 % Improved Alternating Temporal Logic
1623 \cmdtxtoparname{ATLP}[ATL$^{+}$]
1624
1625 % Weak Improved Alternating Tree Logic
1626 \DeclareRobustCommand{\WATLP}
1627   {{\txtname{W}}\ATLP}
1628
1629 % Quantified Improved Alternating Temporal Logic
1630 \DeclareRobustCommand{\QATLP}
1631   {{\txtname{Q}}\ATLP}
1632 \DeclareRobustCommand{\EATLP}
1633   {\ensuremath{\exists}\ATLP}
1634 \DeclareRobustCommand{\UATLP}
1635   {\ensuremath{\forall}\ATLP}
1636
1637 % Full Alternating Temporal Logic
1638 \cmdtxtoparname{ATLS}[ATL*]
1639
1640 % Weak Full Alternating Tree Logic
1641 \DeclareRobustCommand{\WATLS}
1642   {{\txtname{W}}\ATLS}
1643
1644 % Quantified Full Alternating Temporal Logic
1645 \DeclareRobustCommand{\QATLS}
1646   {{\txtname{Q}}\ATLS}
1647 \DeclareRobustCommand{\EATLS}
1648   {\ensuremath{\exists}\ATLS}
1649 \DeclareRobustCommand{\UATLS}
1650   {\ensuremath{\forall}\ATLS}

1651 %%** Syntax ********************************************************************%%
```

`\EExs, \AAll` ...

```
1652 \DeclareRobustCommand{\EExs}[1]
1653   {\mth{\argmid{\langle\!\langle}{\defval{#1}{\emptyset}}{\rangle\!\rangle}}}
1654 \DeclareRobustCommand{\AAll}[1]
1655   {\mth{\argmid{\left[\left[}{\defval{#1}{\emptyset}}{\right]\right]}}}

1656 %%** Semantics ****************************************************************%%
```

`\CGS` ...

```
1657 \cmdtxtname{CGS}
```

`\CGSStr, ...` ...

```
1658 \newcommand{\cgsstr}{G}
1659 \usrmthlatupp{CGS}{Str}{str}[\cgsstr]
```

`\AgnSet, ...` ...

```
1660 \newcommand{\agnsym}{a}
1661 \newcommand{\agnset}{Ag}
1662 \cmdmthsetext{Agn}[\agnset][\agnsym]
```

\PosSet, ...

```
\providecommand{\possym}{v}
\providecommand{\posset}{Ps}
\cmdmthsetext{Pos}[\posset][\possym]
\cmdmthsymelm{ipos}[\possym_{I}]
\cmdmthsymelm{fpos}[\possym_{F}]
\cmdmthset{PPos}[\posset_{\PlrSym}]
\cmdmthsymelm{ppos}[\possym_{\PlrSym}]
\cmdmthset{OPos}[\posset_{\OppSym}]
\cmdmthsymelm{opos}[\possym_{\OppSym}]
```

\SttSet, ...

```
\newcommand{\sttsym}{s}
\newcommand{\sttset}{St}
\cmdmthsetext{Stt}[\sttset][\sttsym]
\cmdmthset{ISt}[\sttset_{I}]
\cmdmthsymelm{istt}[\sttsym_{I}]
\cmdmthset{FStt}[\sttset_{F}]
\cmdmthsymelm{fstt}[\sttsym_{F}]
```

\ActSet, ...

```
\newcommand{\actsym}{c}
\newcommand{\actset}{Ac}
\cmdmthsetext{Act}[\actset][\actsym]
```

\DecSet, ...

```
\newcommand{\decsym}{d}
\newcommand{\decset}{Dc}
\cmdmthsetext{Dec}[\decset][\decsym]
```

\movFun ...τ

```
\newcommand{\movsym}{\tau}
\cmdmthfun{mov}[\movsym]
```

\HstSet, ...

```
\providecommand{\hstsym}{\rho}
\providecommand{\hstset}{Hst}
\cmdmthsetext{Hst}[\hstset][\hstsym]
\cmdmthset{PHst}[\hstset_{\PlrSym}]
\cmdmthsymelm{phst}[\hstsym_{\PlrSym}]
\cmdmthset{OHst}[\hstset_{\OppSym}]
\cmdmthsymelm{ohst}[\hstsym_{\OppSym}]
\cmdmthfun{hst}
```

\PlaySet,\playFun ...

```
\providecommand{\playsym}{\pi}
\providecommand{\playset}{Play}
\cmdmthsetext{Play}[\playset][\playsym]
\cmdmthfun{play}
```

\StrSet, ...

```
\providecommand{\strsym}{\sigma}
\providecommand{\strset}{Str}
\cmdmthsetext{Str}[\strset][\strsym]
\cmdmthset{PStr}[\strset_{\PlrSym}]
\cmdmthsymelm{pstr}[\strsym_{\PlrSym}]
\cmdmthset{OStr}[\strset_{\OppSym}]
\cmdmthsymelm{ostr}[\strsym_{\OppSym}]
```

\PrfSet, \prfFun ...

```
\providecommand{\prfsym}{\xi}
\providecommand{\prfset}{Prf}
\cmdmthsetext{Prf}[\prfset][\prfsym]
```

```
%%** Strategic Logics II ****************************************************%%
```

\SL, ...

```
% Strategy Logic
\cmdtxtoparname{SL}

\DeclareRobustCommand{\ESL}
  {\ensuremath{\exists}\SL}
\DeclareRobustCommand{\USL}
  {\ensuremath{\forall}\SL}

\DeclareRobustCommand{\FSL}
  {{\txtname{F}}\SL}

\DeclareRobustCommand{\EFSL}
  {\ensuremath{\exists}\FSL}
\DeclareRobustCommand{\UFSL}
  {\ensuremath{\forall}\FSL}

% One-Goal Strategy Logic
\DeclareRobustCommandx{\OGSL}[3][1=, 2=, 3=]
  {\SL[#1][#2][1g\arglef{,}{#3}]}

\DeclareRobustCommand{\EOGSL}
  {\ensuremath{\exists}\OGSL}
\DeclareRobustCommand{\UOGSL}
  {\ensuremath{\forall}\OGSL}

\DeclareRobustCommand{\FOGSL}
  {{\txtname{F}}\OGSL}

\DeclareRobustCommand{\EFOGSL}
  {\ensuremath{\exists}\FOGSL}
\DeclareRobustCommand{\UFOGSL}
  {\ensuremath{\forall}\FOGSL}

% Conjunctive-Goal Strategy Logic
\DeclareRobustCommandx{\CGSL}[3][1=, 2=, 3=]
  {\SL[#1][#2][cg\arglef{,}{#3}]}

\DeclareRobustCommand{\ECGSL}
  {\ensuremath{\exists}\CGSL}
\DeclareRobustCommand{\UCGSL}
  {\ensuremath{\forall}\CGSL}

\DeclareRobustCommand{\FCGSL}
  {{\txtname{F}}\xGSL}

\DeclareRobustCommand{\EFCGSL}
  {\ensuremath{\exists}\FCGSL}
\DeclareRobustCommand{\UFCGSL}
  {\ensuremath{\forall}\FCGSL}

% Disjunctive-Goal Strategy Logic
\DeclareRobustCommandx{\DGSL}[3][1=, 2=, 3=]
  {\SL[#1][#2][dg\arglef{,}{#3}]}

\DeclareRobustCommand{\EDGSL}
  {\ensuremath{\exists}\DGSL}
\DeclareRobustCommand{\UDGSL}
  {\ensuremath{\forall}\DGSL}

\DeclareRobustCommand{\FDGSL}
  {{\txtname{F}}\xGSL}
```

```
1771
1772 \DeclareRobustCommand{\EFDGSL}
1773   {\ensuremath{\exists}\FDGSL}
1774 \DeclareRobustCommand{\UFDGSL}
1775   {\ensuremath{\forall}\FDGSL}
1776
1777 % Alternating-Goal Strategy Logic
1778 \DeclareRobustCommandx{\AGSL}[3][1=, 2=, 3=]
1779   {\SL[#1][#2][ag\arglef{,}{#3}]}
1780
1781 \DeclareRobustCommand{\EAGSL}
1782   {\ensuremath{\exists}\AGSL}
1783 \DeclareRobustCommand{\UAGSL}
1784   {\ensuremath{\forall}\AGSL}
1785
1786 \DeclareRobustCommand{\FAGSL}
1787   {{\txtname{F}}\xGSL}
1788
1789 \DeclareRobustCommand{\EFAGSL}
1790   {\ensuremath{\exists}\FAGSL}
1791 \DeclareRobustCommand{\UFAGSL}
1792   {\ensuremath{\forall}\FAGSL}
1793
1794 % Extended-Goal Strategy Logic
1795 \DeclareRobustCommandx{\EGSL}[3][1=, 2=, 3=]
1796   {\SL[#1][#2][eg\arglef{,}{#3}]}
1797
1798 \DeclareRobustCommand{\EEGSL}
1799   {\ensuremath{\exists}\EGSL}
1800 \DeclareRobustCommand{\UEGSL}
1801   {\ensuremath{\forall}\EGSL}
1802
1803 \DeclareRobustCommand{\FEGSL}
1804   {{\txtname{F}}\xGSL}
1805
1806 \DeclareRobustCommand{\EFEGSL}
1807   {\ensuremath{\exists}\FEGSL}
1808 \DeclareRobustCommand{\UFEGSL}
1809   {\ensuremath{\forall}\FEGSL}
1810
1811 % Boolean-Goal Strategy Logic
1812 \DeclareRobustCommandx{\BGSL}[3][1=, 2=, 3=]
1813   {\SL[#1][#2][bg\arglef{,}{#3}]}
1814
1815 \DeclareRobustCommand{\EBGSL}
1816   {\ensuremath{\exists}\BGSL}
1817 \DeclareRobustCommand{\UBGSL}
1818   {\ensuremath{\forall}\BGSL}
1819
1820 \DeclareRobustCommand{\FBGSL}
1821   {{\txtname{F}}\xGSL}
1822
1823 \DeclareRobustCommand{\EFBGSL}
1824   {\ensuremath{\exists}\FBGSL}
1825 \DeclareRobustCommand{\UFBGSL}
1826   {\ensuremath{\forall}\FBGSL}
1827
1828 % Nested-Goal Strategy Logic
1829 \DeclareRobustCommandx{\NGSL}[3][1=, 2=, 3=]
1830   {\SL[#1][#2][ng\arglef{,}{#3}]}
1831
1832 \DeclareRobustCommand{\ENGSL}
1833   {\ensuremath{\exists}\NGSL}
```

```
\DeclareRobustCommand{\UNGSL}
  {\ensuremath{\forall}\NGSL}

\DeclareRobustCommand{\FNGSL}
  {{\txtname{F}}\xGSL}

\DeclareRobustCommand{\EFNGSL}
  {\ensuremath{\exists}\FNGSL}
\DeclareRobustCommand{\UFNGSL}
  {\ensuremath{\forall}\FNGSL}

% Undefined-Goal Strategy Logic
\DeclareRobustCommandx{\XGSL}[3][1=, 2=, 3=]
  {\SL[#1][#2][xg\arglef{,}{#3}]}

\DeclareRobustCommand{\EXGSL}
  {\ensuremath{\exists}\XGSL}
\DeclareRobustCommand{\UXGSL}
  {\ensuremath{\forall}\XGSL}

\DeclareRobustCommand{\FXGSL}
  {{\txtname{F}}\xGSL}

\DeclareRobustCommand{\EFXGSL}
  {\ensuremath{\exists}\FXGSL}
\DeclareRobustCommand{\UFXGSL}
  {\ensuremath{\forall}\FXGSL}

%%** Syntax ************************************************************%%
```

\BndSet, ...

```
\newcommand{\bndsym}{\flat}
\newcommand{\bndset}{Bn}
\cmdmthsetext{Bnd}[\bndset][\bndsym]
\usrmth{bnd}{}{argfun}
```

\psn ...

```
\usrmth{psn}{}{argfun}

%%** Semantics ********************************************************%%
```

\nxtFun ...

```
\newcommand{\nxtfun}{nxt}
\cmdmthfun{nxt}[\nxtfun]

\fi
%%*********************************************************************%%
%%*********************************************************************%%
%%** Macros for Automata ***********************************************%%
%%*********************************************************************%%
\ifaut@
%%** Finite Word Automata *********************************************%%
```

\DFA, ...

```
\cmdtxtoparname{DFA}\cmdtxtoparname{NFA}\cmdtxtoparname{UFA}\cmdtxtoparname{AFA}

\cmdtxtoparname{DWA}\cmdtxtoparname{NWA}\cmdtxtoparname{UWA}\cmdtxtoparname{AWA}

\cmdtxtoparname{DFW}\cmdtxtoparname{NFW}\cmdtxtoparname{UFW}\cmdtxtoparname{AFW}
\cmdtxtoparname{DBW}\cmdtxtoparname{NBW}\cmdtxtoparname{UBW}\cmdtxtoparname{ABW}
\cmdtxtoparname{DCW}\cmdtxtoparname{NCW}\cmdtxtoparname{UCW}\cmdtxtoparname{ACW}
\cmdtxtoparname{DPW}\cmdtxtoparname{NPW}\cmdtxtoparname{UPW}\cmdtxtoparname{APW}
\cmdtxtoparname{DRW}\cmdtxtoparname{NRW}\cmdtxtoparname{URW}\cmdtxtoparname{ARW}
\cmdtxtoparname{DSW}\cmdtxtoparname{NSW}\cmdtxtoparname{USW}\cmdtxtoparname{ASW}
\cmdtxtoparname{DMW}\cmdtxtoparname{NMW}\cmdtxtoparname{UMW}\cmdtxtoparname{AMW}
```

```
\GFG, \PD, ...  ...
                \cmdtxtoparname{GFG}

                \cmdtxtoparname{PD}

                %% ...

                %%** Syntax ********************************************************************%%

 \AutName, ...  ...
                \newcommand{\autname}{A}
                \usrmthlatupp{Aut}{Name}{name}[\autname]
                \newcommand{\autset}{Aut}
                \cmdmthset{Aut}[\autset]

     \WAutSet   ...
                \newcommand{\wautset}{WAut}
                \cmdmthset{WAut}[\wautset]

  \SttSet, ...  ...
                \def\sttsym{q}
                \def\sttset{Q}
                \cmdmthsetext{Stt}[\sttset][\sttsym]
                \cmdmthset{IStt}[\sttset_{I}]
                \cmdmthsymelm{istt}[\sttsym_{I}]
                \cmdmthset{FStt}[\sttset_{F}]
                \cmdmthsymelm{fstt}[\sttsym_{F}]

  \SymSet, ...  ...
                \newcommand{\symsym}{\sigma}
                \newcommand{\symset}{\Sigma}
                \cmdmthsetext{Sym}[\symset][\symsym]

      \trnFun   ...
                \newcommand{\trnsym}{\delta}
                \cmdmthfun{trn}[\trnsym]

                %%** Semantics *****************************************************************%%

     \LangFun   ...
                \newcommand{\langfun}{L}
                \cmdmthfun{Lang}[\langfun]

  \WrdSet, ...  ...
                \newcommand{\wrdsym}{w}
                \newcommand{\wrdset}{Wr}
                \cmdmthsetext{Wrd}[\wrdset][\wrdsym]

                %%** Finite Tree Automata ******************************************************%%

    \DTA, ...   ...
                \cmdtxtoparname{DTA}\cmdtxtoparname{NTA}\cmdtxtoparname{UTA}\cmdtxtoparname{ATA}

                \cmdtxtoparname{DFT}\cmdtxtoparname{NFT}\cmdtxtoparname{UFT}\cmdtxtoparname{AFT}
                \cmdtxtoparname{DBT}\cmdtxtoparname{NBT}\cmdtxtoparname{UBT}\cmdtxtoparname{ABT}
                \cmdtxtoparname{DCT}\cmdtxtoparname{NCT}\cmdtxtoparname{UCT}\cmdtxtoparname{ACT}
                \cmdtxtoparname{DPT}\cmdtxtoparname{NPT}\cmdtxtoparname{UPT}\cmdtxtoparname{APT}
                \cmdtxtoparname{DRT}\cmdtxtoparname{NRT}\cmdtxtoparname{URT}\cmdtxtoparname{ART}
                \cmdtxtoparname{DST}\cmdtxtoparname{NST}\cmdtxtoparname{UST}\cmdtxtoparname{AST}
                \cmdtxtoparname{DMT}\cmdtxtoparname{NMT}\cmdtxtoparname{UMT}\cmdtxtoparname{AMT}

                %%** Syntax ********************************************************************%%
```

```
\TAutSet  ...
1929 \newcommand{\tautset}{TAut}
1930 \cmdmthset{TAut}[\tautset]

\DirSet, ...  ...
1931 \newcommand{\dirsym}{d}
1932 \newcommand{\dirset}{\Lambda}
1933 \cmdmthsetext{Dir}[\dirset][\dirsym]

1934 %%** Semantics ********************************************************************%%

\TreeSet, ...  ...
1935 \newcommand{\treesym}{T}
1936 \newcommand{\treeset}{Tr}
1937 \cmdmthsetext{Tree}[\treeset][\treesym]

\wotFun  ...
1938 \newcommand{\wotfun}{wot}
1939 \cmdmthfun{wot}[\wotfun]

1940 \fi
1941 %%*************************************************************************************%%

1942 %%*************************************************************************************%%
1943 %%** Format Tricks ******************************************************************%%
1944 %%*************************************************************************************%%
1945 \iffrm@

...  ...
1946 %%...

1947 \fi
1948 %%*************************************************************************************%%

1949 %%*************************************************************************************%%
1950 %%** Figure Tricks ******************************************************************%%
1951 %%*************************************************************************************%%
1952 \iffig@

1953 \RequirePackage{tikz}
1954 \usetikzlibrary{arrows,graphs,matrix,patterns,shapes}

1955 \tikzstyle{every node} =
1956   [draw = none, fill = none, black, thin]
1957 \tikzstyle{every edge} +=
1958   [black, thick]

1959 \tikzstyle{noall} =
1960   [draw = none, fill = none]
1961 \tikzstyle{nodraw} =
1962   [draw = none, fill = white]
1963 \tikzstyle{nofill} =
1964   [draw = black, fill = none]

1965 \ifwrpfig@
1966   % Wrapfig Package
1967   \RequirePackage{wrapfig}
1968 \fi

1969 \fi
1970 %%*************************************************************************************%%

1971 %%*************************************************************************************%%
1972 %%** Table Tricks *******************************************************************%%
1973 %%*************************************************************************************%%
1974 \iftab@

...  ...
1975 %%...
```

```
\fi
%%*****************************************************************************%%
%%*****************************************************************************%%
%%** Algorithm Tricks *********************************************************%%
%%*****************************************************************************%%
\ifalg@
\RequirePackage[ruled,vlined]{algorithm2e}
\setlength{\algomargin}{1.25em}
\DontPrintSemicolon
\SetInd{0.25em}{0.5em}
```

`\Signature` ...

```
\SetKw{Signature}{signature}
```

`\Macro, ...` ...

```
\SetKwFor{Macro}{macro}{}{}
\SetKwFor{Function}{function}{}{}
\SetKwFor{Procedure}{procedure}{}{}
```

`\Let` ...

```
\SetKwFor{Let}{let}{in}{}
```

`\True, \False` ...

```
\SetKw{True}{true}
\SetKw{False}{false}
```

`\From, ...` ...

```
\SetKw{From}{from}
\SetKw{To}{to}
\SetKw{DownTo}{downto}
```

`\GoTo, ...` ...

```
\SetKw{GoTo}{goto}
\SetKw{Break}{break}
\SetKw{Continue}{continue}
```

`\MIf, ...` ...

```
\SetKwIF{MIf}{MElseIf}{MElse}{\#if}{\#then}{\#else \#if}{\#else}{\#endif}
```

`\nlr` ...

```
\DeclareRobustCommand{\nlr}[1]
  {\addtocounter{AlgoLine}{1}%
  \nlset{\arabic{AlgoLine}-\addtocounter{AlgoLine}{#1}\arabic{AlgoLine}}}
\fi
%%*****************************************************************************%%
\endinput
⟨/package⟩
```

2 Change History

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Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

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