

# A Guide to How to Define Macros

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# 1 \def

```
\def\foo#1#2{... #1 ... #2}
```

## 2 \newcommand

```
\newcommand\foo[2]{... #1 ... #2}  
\renewcommand\foo[2]{... #1 ... #2}  
\newcommand*\foo[2]{... #1 ... #2}  
\renewcommand*\foo[2]{... #1 ... #2}
```

```
\newcommand\myemph[1]{\textcolor{blue}{\textit{#1}}}  
\newcommand*\myemph[1]{\textcolor{blue}{\textit{#1}}}  
... \myemph{Darth Vader ... \par ...
```

```
\newfontfamily\mysymfont{HCR Batang LVT}  
\newcommand*\mysym[1]{\{\mysymfont\char"#1}}  
\newcommand*\mysmiley{\mysym{263A}}
```

\LARGE \mysym{2639} \mysmiley



### 3 \providecommand

```
\providecommand\foo[2]{... #1 ... #2}  
\providecommand*\foo[2]{... #1 ... #2}
```

```
\providecommand*\mysmile{\mysym{261A}}  
\providecommand*\myfrownie{\mysym{2639}}  
\LARGE \mysmile \myfrownie
```



## 4 \DeclareRobustCommand

```
\DeclareRobustCommand\foo[2]{... #1 ... #2}
```

```
\section{\TeX}  
\section{\LaTeX}  
.toc:  
\contentsline {section}{\numberline {1}  
T\kern -.1667em\lower .5ex\hbox {E}\kern -.125emX\spacefactor \@m }{1}  
\contentsline {section}{\numberline {2}\LaTeX }{1}
```

```
\section{\protect\TeX}  
.toc:  
\contentsline {section}{\numberline {3}\TeX }{1}
```



## 5 Starred Commands

```
\makeatletter
\newcommand\myemph{\@ifstar{\myemph@xii}{\myemph@xi}}
\newcommand*\myemph@xi[1]{\textcolor{blue}{\textit{#1}}}
\newcommand*\myemph@xii[1]{\textcolor{red}{\textit{#1}}}
\makeatother
\myemph{Darth Vader} \myemph*{Darth Vader}
```



*Darth Vader* *Darth Vader*

## 6 Optional Arguments

```
\newlength\myvert{}  
\newcommand\myraise[2][\@empty]{%  
\ifx\@empty#1%  
\setlength\myvert{0ex}%  
\else%  
\setlength\myvert{#1}%  
\fi%  
\raisebox{\myvert}{#2}}
```

\large Darth Vader \myraise{\mysmile} is a central character \myraise[.25ex]{\mysmile}  
in the Star Wars saga.



Darth Vader ☺ is a central character ☺ in the Star Wars saga.

## Two Optional Arguments: *twoopt* Package

```
\newcommand*\ui{\textsf{#1}\index{#1}}
\newcommandtwoopt{\menu}[4][\@empty][\@empty]{%
\ifx#1\@empty%
\ui{#3} > \ui{#4}%
\else%
\ifx#2\@empty%
\ui{#1} > \ui{#3} > \ui{#4}%
\else%
\ui{#1} > \ui{#2} > \ui{#3} > \ui{#4}%
\fi%
\fi%
}
```

```
\menu{File}{New} \par
```

```
\menu[Format]{Syntax Coloring}{LaTeX} \par
```

`\menu[Search] [Replace]{Files}{All}`



**File > New**

**Format > Syntax Coloring > LaTeX**

**Search > Replace > Files > All**

## Optional Keys I: *keycommand* Package

```
\newkeycommand\LineFig[scale=1, raise=-0.5ex, bool showfilename=false][1]{  
\raisebox{\commandkey{raise}}{\includegraphics[scale=\commandkey{scale}]{#1}}  
\ifthenelse{\equal{\commandkey{showfilename}}{1}}{\{\tiny#1\}}{}}
```

```
aaa \LineFig{UCtiny.png} bbb \par  
bbb \LineFig[scale=2, showfilename=true]{UCtiny.png} ccc \par  
ccc \LineFig[raise=1ex]{UCtiny.png} ddd
```



aaa  bbb

bbb  UCtiny.png CCC

ccc  ddd

## Optional Keys II: *xkeyval* Package

```
\define@boolkey{foo}{bkey}[true]{\ifKV@foo@bkey ... \else ... \fi}
\define@key{foo}{akey}{ ... #1 ...}
\presetkeys{foo}{bkey=, akey=, ...}{}
\newcommand\foo[2][]{
\setkeys{foo}{#1}
... #2 ...
}

\foo[akey=, ...]{...}
```

## 7 Conditionals: *xifthen* (or *etoolbox*) package

### Booleans

```
\ifx{\@empty}{#1} ... \else ... \fi  
\newif\ifmyc@nd \myc@ndtrue \myc@ndfalse  
\ifmyc@nd ... \else ... \fi
```

```
\newboolean{myc@nd}  
\setboolean{myc@nd}{true/false}  
\ifthenelse{\boolean{myc@nd}}{true}{false}
```

# Strings

```
\ifthenelse{\equal{#1}{...}}{true}{false}  
\ifthenelse{\equal{#1}{\str}}{true}{false}
```



# Counters

```
\newcounter{mycnt}  
\setcounter{mycnt}{3}  
\renewcommand\themycnt{\Alph{mycnt}}  
\themycnt
```

▶ C  
true false true

```
\ifthenelse{\value{page} > 10}{true}{false}  
\ifthenelse{\value{page} = \value{mycnt}}{true}{false}  
\ifthenelse{\value{mycnt} < 10}{true}{false}
```

# Dimensions

```
\newlength\mylength  
\setlength\mylength{10cm}
```

```
\ifthenelse{\lengthtest{\mylength < \textwidth}}{true}{false}  
\ifdim \mylength > \linewidth true \else false \fi
```



true false

## 8 \newenvironment

```
\newenvironment{name}{beginning}{ending}
\renewenvironment{name}{beginning}{ending}
```

```
\newenvironment{mypara}[1]{\par\textbf{#1}\begin{center}\small}{\end{center}}
\begin{mypara}{Luke Skywalker}
Luke Skywalker is a fictional character and the main protagonist of
the original film trilogy of the Star Wars franchise.
\end{mypara}
```



### **Luke Skywalker**

Luke Skywalker is a fictional character and the main protagonist of the original film trilogy of the Star Wars franchise.

# Listing Environments

```
\newenvironment{mylist}{  
\begin{list}{\hzsmliley}{\itshape}  
}{  
\end{list}  
}
```

```
\begin{mylist}  
\item Wonder Girls  
\item Girls' Generation  
\end{mylist}
```



☺ *Wonder Girls*

☺ *Girls' Generation*

## Exercise

```
%\usepackage{xstring}
\newcommand\selectedmark{\mysym{2611}}
\newcommand\unselectedmark{\mysym{2610}}
\newcommand\selectednum{}
\newcounter{optionnum}

\newcommand\selectedlabel{
\setcounter{optionnum}{0}
\renewcommand\makelabel{
\stepcounter{optionnum}
\IfSubStr{\ch@ices}{+\theoptionnum+}{\selectedmark}{\unselectedmark}}}

\def\ch@ices{}
\newenvironment{selected}[1]{
\@for\@CurrentItem:=#1\do{%
\edef\@CurrentItem{+\@CurrentItem+}
\expandafter\edef\expandafter\ch@ices\expandafter{\ch@ices\@CurrentItem}}%
\begin{list}{}{\selectedlabel}}{\end{list}}
```

My favorite idol girl groups are:  
`\begin{selected}{2,4,5}\tightlist`  
`\item Wonder Girls`  
`\item Girls' Generation`  
`\item T-ara`  
`\item Davichi`  
`\item Secret`  
`\item Sistar`  
`\item 4minute`  
`\end{selected}`

My favorite idol girl groups are:

- Wonder Girls
- Girls' Generation
- T-ara
- Davichi
- Secret
- Sistar
- 4minute



## Converting a Command to an Environment: *environ* Package

```
\NewEnviron{Foo}[2] []{\foo[#1]{#2}{\BODY}}  
  
\begin{Foo}[akey=,...]  
...  
\end{Foo}
```

## 9 Miscellaneous Tips

```
\let  
\relax
```

```
\def\aaa{AAA}  
\def\bbb{BBB}  
\def\ccc{CCC}  
\let\kkk\aaa  
\kkk\par  
\let\kkk\bbb  
\kkk\par  
\let\kkk\ccc  
\kkk  
\let\kkk\relax  
\kkk
```

```
AAA  
▶ BBB  
CCC
```



```
\ifcase\value{cnt} \or ... \or ... \or\fi
```

```
\newcounter{MyCnt}  
\setcounter{MyCnt}{4}
```

```
\ifcase\value{MyCnt}\or  
Wonder Girls\or  
Girls' Generation\or  
T-ara\or  
Davichi\or  
Secret\or  
Sistar\or  
4minute\or  
\fi
```

► Davichi