

The “key-value” structure in \LaTeX

Live Coding

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실습자료: latex-commands.tex

`\newcommand{<name>}[<# of args>][<first>]{<code>}`

```
1 \newcommand{\N}{\mathbb{N}}
2 \newcommand{\Z}{\mathbb{Z}}
3 \newcommand{\R}{\mathbb{R}}
4 \newcommand{\C}{\mathbb{C}}
5 \newcommand{\nset}[1]{\mathbb{#1}}
6 \newcommand{\ndim}[2][3]{\mathbb{#2}^{\#1}}
7 % ...
8 $\Z, \nset{B}, \ndim{R}, \ndim[2]{C}$
```

$\mathbb{Z}, \mathbb{B}, \mathbb{R}^3, \mathbb{C}^2$

T_EX commands

실습자료: tex-commands.tex

`\def\name<param text>\{ <code>\}`

```
1 \def\N{\mathbb{N}}
2 \def\Z{\mathbb{Z}}
3 \def\R{\mathbb{R}}
4 \def\C{\mathbb{C}}
5 \def\nset#1{\mathbb{#1}}
6 \def\ndim[#1]#2{\mathbb{#2}^{\#1}}
7 % ...
8 $\Z, \nset{B}, \ndim[3]{R}, \ndim[2]{C}$
```

$\mathbb{Z}, \mathbb{B}, \mathbb{R}^3, \mathbb{C}^2$

- 사실 전의 `\newcommand`에 *을 붙여야(`\newcommand*`), `\def`처럼 한 문단 이상 인자를 받지 않음.

Key-value?

본 슬라이드의 preamble에서...

```
1 %%%%%%%%%%%  
2 % Beamer Settings %  
3 %%%%%%%%%%%  
4 \usetheme[  
5   numbering=fraction,  
6   subsectionpage=progressbar  
7 ]{metropolis}  
8 \usecolortheme{rose}  
9 \useoutertheme[subsection=false]{miniframes}
```

Key-value?

CTAN
Comprehensive T_EX Archive Network

Location: CTAN > Topics > Key-Val

Key-Val

This topic contains packages with key-value argument systems.

catoptions Preserving and recalling standard catcodes.	keyreader A robust interface to xkeyval.	l^AT_EX2_ε option processing using l ^A T _E X3 keys.	pst-xkey Key-value syntax for PSTricks packages.
clshval Key-Value support with a hash.	keyval Process 'key-value' schemes.	l^AT_EX l^ATeXkeys A robust key parser for l ^A T _E X.	scrbase Provide basic features for KOMA-Script.
exkvy An expandable key-val implementation.	keyval2e A lightweight and robust key-value parser.	luakeys A Lua module for parsing key-value options.	simplekvy A simple key/value system for T _E X and l ^A T _E X.
exkvy-ca Define expandable key-val macros using exkvy.	kvdefinekeys Define keys for use in the kvsetkeys package.	options Provides convenient key-value options for l ^A T _E X package writers.	keycommand Create commands using parameters and keyval in parallel.
exkvy-def A key-defining frontend for exkvy.	kvoptions Key value format for package options.	pgfkeys Key value control for PGF.	skxkeyval Key-value parsing combining features of skxval and pgfkeys.
exkvy-opt Parse class and package options with exkvy.	kvsetkeys Key value parser with default handler support.	pgfkeys Extended and more robust version of pgfkeys.	skxval Extension of the keyval package.
keycommand Simple creation of commands with key-value arguments.	l^ATeXkeys2e	pgfkeys l ^A T _E X package options with pgfkeys.	yax Yet Another Key System.

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<https://ctan.org/topic/keyval>

History

- *keyval* (Charlisle, '99)
- *xkeyval* (Adriaens, '08)
- *kvoptions* (Oberdiek, '09)
- *kvsetkeys* (Oberdiek, '09)
- *keycommand* (Chervet, '09)
- *pgfkeys* (Tantau, '08)
- ...

keyval에서 키 정의하기

실습자료: keyval-tutorial.tex

```
1 % 매크로에 값 저장하기
2 \define@key{fam}{name}{\def\fam@name{#1}}
3 % 초기값 설정하기
4 \def\fam@name{\TeX}
5 \define@key{fam}{name}{%
6   \def\fam@name{#1}%
7 }
8 % 기본값 설정하기 (!= 초기값)
9 \define@key{fam}{name}[unknown]{%
10   \def\fam@name{#1}%
11 }
```

기본값을 지정하면 `\setkeys{fam}{key}`가
`\setkeys{fam}{key=default}`와 동일한 효과.

keyval에서 키 지정하기

실습자료: keyval-tutorial.tex

```
1 \newcommand{\hello}{Hello, \fam@name!}  
2 % ...  
3 \hello  
4 \setkeys{fam}{name}  
5 \hello  
6 \setkeys{fam}{name = \LaTeX}  
7 \hello
```

기본값을 설정한다고 초기값이 되는 것이 아님에 유의.

kvoptions의 옵션 정의

실습자료: kvoptions-tutorial.tex, kvsample.sty

```
1 % kvsample.sty
2 \SetupKeyvalOptions{
3   family=kvsample,
4   prefix=kvsample@
5 }
6 \DeclareBoolOption{active}
7 % 상호배타적인 옵션 정의
8 \DeclareBoolOption{final}
9 \DeclareComplementaryOption{draft}{final}
10 % keyval에서 초기값 설정하기에 대응
11 \DeclareStringOption[initial]{key}
12 % 모든 옵션들을 처리
13 \ProcessKeyvalOptions{kvsample}
14 % kvoptions-tutorial.tex
15 \usepackage[draft=false,active,key={val 1}]{kvsample}
```

kvoptions의 사용

실습자료: kvoptions-tutorial.tex, kvsample.sty

```
1 % kvoptions-tutorial.tex
2 % 사실은 kvsample.sty에서만 써야하는 것들이지만...
3 \ifkvsample@active
4   {Active}
5 \else
6   {Inactive}
7 \fi
8 \ifkvsample@final
9   {Final}
10 \else
11   {Draft}
12 \fi
13 Key stored: \kvsample@key
```

kvoptions를 사용한 실례

실습자료: xmph-kvoptions.sty

Implementing key-value input: An introduction (Wright & Feuersänger, '09)

```
1 \usepackage[
2   active,
3   usebold,
4   usecolor,
5   color=blue,
6 ]{xmph}
7 % ...
8 \xmph{a+b=c}
```

$a+b=c$

pgfkeys의 특징

- 키를 정의할 때도 key-value 시스템을 사용하여 편리함.
- 키를 정의할 때와 설정할 때 둘 다 같은 명령어를 사용.
- 트리 형태의 key-value 구조를 사용.
- ‘키 핸들러’라는 접미어를 사용:

```
1 \pgfkeys{/path/key/.code={#1}}
```

와 같이 정의 후

```
1 \pgfkeys{/path/key=value}
```

와 같이 사용하면 그대로 ‘value’를 출력.

- 이러한 특징들은 *l3keys*에서 계승.
 - ▶ 다만 *l3keys*에서는 키를 정의하고 설정할 때 다른 매크로를 사용.

pgfkeys의 사용

실습자료: xmph-pgfkeys.sty

```
1 \newif\ifxmph@useitalic
2 \newif\ifxmph@usebold
3 \newif\ifxmph@usecolour
4 \pgfkeys{
5   /xmph/.cd,
6   useitalic/.is if = xmph@useitalic,
7   usebold/.is if = xmph@usebold,
8   usecolour/.is if = xmph@usecolour,
9   usecolor/.is if = xmph@usecolour,
10  useitalic/.default = true,
11  usebold/.default = true,
12  usecolour/.default = true,
13  usecolor/.style = {usecolour=#1},
14  colour/.store in = \xmph@colour,
15  color/.style = {colour=#1},
16  inactive/.code = {%
17    \PackageInfo{xmph}{Package inactive}
18    \let\xmph\emph}}
19 \pgfkeys{
20   /xmph/.cd,
21   useitalic,
22   colour = red}
23 \ProcessPgfOptions*
```

Expl3 live coding session

실습자료: l3keys-tutorial.tex, textstats-*.tex,
textstats.sty