

# Sample document

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## 1 LAlignAnd

$\&=$	$a = b$	ok
	$c = d$	
$=\&$	$a = b$	ng
	$c = d$	
$=\{\}\&$	$a = b$	ok
	$c = d$	

## 2 LAlignEnd

The following ends with a line break.

$$f(x) = ax^2 + bx + c$$
$$g(x) = dx^2 + ex + f$$

The following does not end with a line break.

$$f(x) = ax^2 + bx + c$$
$$g(x) = dx^2 + ex + f$$

Here is the next line after the align environment.

## 3 LAlignSingleLine

Long line before display (same result)	
Lorem ipsum.	Lorem ipsum.
$f(x) = ax^2 + bx + c$	$f(x) = ax^2 + bx + c$
This is an <b>equation</b> environment.	This is an <b>align</b> environment.

Short line before display (different result)

Lrm:

$$f(x) = ax^2 + bx + c$$

This is an [equation](#) environment.

Lrm:

$$f(x) = ax^2 + bx + c$$

This is an [align](#) environment.

Single-line alignat environment is also detected.

$$f(x) = ax^2 + bx + c$$

Multi-line alignat environment is not detected.

$$f(x) = ax^2 + bx + c$$

$$g(x) = dx^2 + ex + f$$

## 4 LLBig

This is a sample text. This is a sample text. This is a sample text.

Both bigcup  $\bigcup_{x \in B} O_x$  and cup  $\bigcup_{x \in B} O_x$  do not spoil the line spacing.

This is a sample text. This is a sample text. This is a sample text.

$$\begin{array}{cccccccccccc} X_1 \cap X_2 & X_1 \cup X_2 & X_1 \odot X_2 & X_1 \oplus X_2 & X_1 \otimes X_2 & & & & & & & \\ X_1 \sqcup X_2 & X_1 \uplus X_2 & X_1 \vee X_2 & X_1 \wedge X_2 & \text{ok} & & & & & & & \\ \bigcap_{i=1}^{\infty} X_i & \bigcup_{i=1}^{\infty} X_i & \bigodot_{i=1}^{\infty} X_i & \bigoplus_{i=1}^{\infty} X_i & \bigotimes_{i=1}^{\infty} X_i & \bigsqcup_{i=1}^{\infty} X_i & \biguplus_{i=1}^{\infty} X_i & \bigvee_{i=1}^{\infty} X_i & \bigwedge_{i=1}^{\infty} X_i & \text{ok} & & \\ \cap_{i=1}^{\infty} X_i & \cup_{i=1}^{\infty} X_i & \odot_{i=1}^{\infty} X_i & \oplus_{i=1}^{\infty} X_i & \otimes_{i=1}^{\infty} X_i & & & & & & & \\ \sqcup_{i=1}^{\infty} X_i & \uplus_{i=1}^{\infty} X_i & \vee_{i=1}^{\infty} X_i & \wedge_{i=1}^{\infty} X_i & \text{ng} & & & & & & & \end{array}$$

## 5 LLBracketCurly

$$\begin{array}{lll} \backslash\max(a,b) & \max(a,b) & \text{ok} \\ \backslash\max\{a,b\} & \max a,b & \text{ng} \\ \backslash\max \{a,b\} & \max a,b & \text{ok?} \end{array}$$

We cannot fully determine whether the use of curly brackets is wrong or not. It is not detected if some spaces are inserted between the command name and the curly brackets.

$\min(a,b)$  and  $\min a,b$  are also checked.

## 6 LLBracketMissing

$$\begin{array}{lll} x^{\{23\}} & x^{23} & \text{ok} \\ x^2 \, 3 & x^2 3 & \text{ok} \\ x^{23} & x^2 3 & \text{ng} \end{array}$$

$x_2 3$ ,  $x^a b$  and  $x_a b$  are also checked. Cases like  $x^a b$ ,  $x^2$  and  $e^i \pi$  are not detected.

## 7 LLBracketRound

<code>\sqrt{a}</code>	$\sqrt{a}$	ok
<code>\sqrt(a)</code>	$\sqrt{(a)}$	ng

$a^{(1)}$  and  $a_{(1)}$  are also checked.

## 8 LLColonEqq

<code>\coloneqq</code>	$x := y$	ok
<code>\Coloneqq</code>	$x ::= y$	ok
<code>:=</code>	$x := y$	ng
<code>::=</code>	$x ::= y$	ng

The difference is quite subtle, but the vertical position of the colon is different.

## 9 LLColonForMapping

<code>A:B</code>	$A : B$	ok
<code>A\colon B</code>	$A : B$	ng
<code>f:</code>	$f : \mathbb{R} \rightarrow \mathbb{R}$	ng
<code>f\colon</code>	$f : \mathbb{R} \rightarrow \mathbb{R}$	ok

— We detect all of `:` in the following —

Here are examples of colons we detect.

- $f : X \rightarrow Y$
- $g : X \mapsto Y$
- $h : \mathbb{R}^{n^2+2n+1} \rightarrow \mathbb{R}$

and

$$f : (X \text{ at new line in tex file}) \rightarrow (Y \text{ at new line in tex file}). \quad (1)$$

— We do NOT detect any of `:` in the following —

Here are examples of `:` we do not detect.

- $f : X \rightarrow Y$ , the correct use of `\colon`.
- $A : B : C = 1 : 2 : 3$ , the colon for ratio.
- $A : B = 1 : 2$  and  $X \rightarrow Y$ , separated by dollar sign.
- $g : (\text{some very very very very long long long words}) \rightarrow \mathbb{R}$ , the false negative.

## 10 LLCref

**Theorem 1.** *This is a sample theorem.*

Use Thm. 1 with cref instead of Theorem 1 with ref to avoid mistakes.

## 11 LLDoubleQuotes

Use “XXX” instead of “XXX” or ”XXX”. You can use double quotation marks for H\“older.

## 12 LLENDash

hyphen (-)	A-B
en-dash (--)	A–B
em-dash (---)	A—B

- Erdos-Renyi (random graph, Erdős–Rényi)
- Einstein-Podolsky-Rosen (quantum physics, Einstein–Podolsky–Rosen)
- Fruchterman-Reingold (graph drawing, Fruchterman–Reingold)
- Gauss-Legendre (numerical integration, Gauss–Legendre)
- Gibbs-Helmholtz (thermodynamics, Gibbs–Helmholtz)
- Karush-Kuhn-Tucker (optimization, Karush–Kuhn–Tucker)

Exceptions: Award-Winning, Best-In-Class, Bottom-Up, Cutting-Edge, Data-Driven, Deep-Learning, Feature-Based, Feature-Selection, First-Order, Fritz-John, Full-Time, High-Class, High-Dimensional, High-End, High-Quality, Higher-Order, Ill-Defined, Ill-Posed, Long-Term, Low-Dimensional, Machine-Learning, Non-Convex, Non-Empty, Non-Linear, Non-Negative, Non-Positive, Non-Zero, Open-Source, Part-Time, Pop-Culture, Real-Time, Reinforcement-Learning, Second-Order, Short-Term, State-Of-The-Art, Third-Order, Top-Down, Top-Rated, User-Friendly, Well-Being, Well-Defined, Well-Documented, Well-Known, Well-Posed, Zero-Sum

False Positive: Wrong-Example

## 13 LLEqnarray

We should not use eqnarray. It has some spacing issues.

$$\begin{array}{rcl} x & = & y \\ a & = & b \end{array}$$

## 14 LLLlGg

<code>\ll</code>	$n \ll m$	ok
<code>&lt;&lt;</code>	$n << m$	ng

I like human <<< cat <<<<<<< dog.

## 15 LLRefEq

To refer to the equation, use (1) with eqref instead of (1) with ref.  
You can avoid the mistake of forgetting to add parentheses.

## 16 LLSharp

<code>\#</code>	$\#A$	ok
<code>\sharp</code>	$\sharp A$	ng

If you really want to use  $\sharp$ , you can disable this rule.

## 17 LLNonASCII

The following line contains non-ASCII characters.

! " # \$ % & ' ( ) \* + , - . /

日本語の文章は、upLaTeXでフツウに書けます。  
(You can write Japanese sentences as usual with upLaTeX.)

## 18 LLSI

<code>\SI{1}{\kilo\byte}</code>	1 kB	ok
<code>1 kB</code>	1 kB	ng
<code>1kB</code>	1kB	ng

10KB, 3.5 MiB, 500GB are detected. 123 noNumWord GB will not be detected.  
Some command named as EB. This is not ExaByte. This 1EB is one ExaByte.

## 19 LLT

<code>^{\top}</code>	$X^{\top}$	ok
<code>^{\mathsf{T}}</code>	$X^{\mathsf{T}}$	ok
<code>^T</code>	$X^T$	ng
<code>^{\mathrm{T}}</code>	$X^{\mathrm{T}}$	ok?

## 20 LLTitle

### 20.1 This Is a Correct Title

#### 20.1.1 this is a wrong title

The quick brown fox jumps over the lazy dog

SubParagraph: Test With Ref 1

### 20.2 IGNORE IF ALL UPPERCASE

#### 20.3 Math Contains version $x$

## 21 LLUserDefined

You can define your own rule.

$f^{\mathrm{a}}(x)$	$f^a(x)$	ok
$f^a(x)$	$f^a(x)$	ng

$f \infConv g$	$f \sqcap g$	ok
$f \Box g$	$f \sqcap g$	ng

## Appendix A LLSetBar

Detecting inappropriate use of the vertical bar  $|$  is very difficult. We are currently trying to detect the following, although not implemented yet.

<code>\lvert -1 \rvert</code>	$ -1 $	ok
<code>\abs{-1}</code>	$ -1 $	ok
<code>\vert -1 \vert</code>	$ -1 $	ng
<code> -1 </code>	$ -1 $	ng

<code>\lVert -x \rVert</code>	$\ -x\ $	ok
<code>\norm{-x}</code>	$\ -x\ $	ok
<code>\Vert -x \Vert</code>	$\ -x\ $	ng
<code>  -x  </code>	$\ -x\ $	ng

<code>\relmiddle </code> (macro)	$\left\{a \mid a > \frac{1}{2}\right\}$	ok
<code>\mid</code>	$\{a \mid a > \frac{1}{2}\}$	ok?
<code> </code>	$\{a \mid a > \frac{1}{2}\}$	ng

<code>\divides</code> (MnSymbol)	$+2 \mid +4$	ok
<code>\mid</code>	$+2 \mid +4$	ok?
<code>\mathrel </code>	$+2 \mid +4$	ok?
<code>\vert</code>	$+2 \mid +4$	ng
<code> </code>	$+2 \mid +4$	ng

<code>f(y x)</code>	$f(y x)$	ok?
<code>f(y \mid x)</code>	$f(y \mid x)$	ok?
<code>f(\,y\mid x\,)</code>	$f(y \mid x)$	ok?
<code>\left. \mathrm{d}v{t} \right _{t=0} f(t)</code>	$\left. \frac{\mathrm{d}}{\mathrm{d}t} \right _{t=0} f(t)$	ok?