# Markdown Cheat Sheet

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## 数学相关LaTeX表达

## 前言

后面介绍的内容是$\LaTeX$排版的数学符号的内容，不止一次有人强调中文版的Wikipedia并不是英文版内容的翻译，并不是。可以对比下参考部分的两个页面，我觉得中文页面做的不错，这两个页面里面关于垂直，貌似有那么点不同。

### 表 1: 数学模式重音符

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 示例 | 代码 | 示例 | 代码 | 示例 | 代码 | 示例 | 代码 |
|  | \hat{a} |  | \check{a} |  | \tilde{a} |  | \acute{a} |
|  | \grave{a} |  | \dot{a} |  | \bar{a} |  | **\ddot{a}** |
|  | \vec{a} |  | \widehat{A} |  | **\widetilde{A}** |  | **\breve{a}** |
|  |  |  | \hat{A} |  | \tilde{A} |  |  |

### 表2: 小写希腊字母

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 示例 | 代码 | 示例 | 代码 | 示例 | 代码 | 示例 | 代码 |
|  | \alpha |  | **\theta** |  | \upsilon |  | o |
|  | **\beta** |  | **\vartheta** |  | **\pi** |  | **\phi** |
|  | **\gamma** |  | **\iota** |  | **\varpi** |  | **\varphi** |
|  | **\delta** |  | **\kappa** |  | **\rho** |  | **\chi** |
|  | **\epsilon** |  | **\lambda** |  | **\varrho** |  | **\psi** |
|  | **\varepsilon** |  | **\mu** |  | **\sigma** |  | **\omega** |
|  | **\zeta** |  | **\nu** |  | **\varsigma** |  | **\nabla** |
|  | **\eta** |  | **\xi** |  | **\tau** |  |  |

### 表 3: 大写希腊字母

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 示例 | 代码 | 示例 | 代码 | 示例 | 代码 | 示例 | 代码 |
|  | **\Gamma** |  | **\Lambda** | $\Sigma\mit\Sigma$ | **\Sigma\mit\Sigma** |  | **\Psi** |
|  | **\Delta** |  | **\Xi** |  | **\Upsilon** | $\Omega\mit\Omega$ | **\Omega\mit\Omega** |
|  | **\Theta** |  | **\Pi** |  | **\Phi** |  |  |

### 表 4: 数学字母

|  |  |
| --- | --- |
| 示例 | 代码 |
|  | \mathbf {ABCdefxyzXYZ123} |
|  | \mathrm {ABCdefxyzXYZ123} |
|  | \mathit {ABCdefxyzXYZ123} |
|  | \mathcal {ABCdefxyzXYZ123} |
|  | \mathscr {ABCdefxyzXYZ123} |
|  | \mathfrak {ABCdefxyzXYZ123} |
|  | \mathbb {ABCdefxyzXYZ123} |
|  | \boldsymbol{ABCdefxyzXYZ123} |

### 表 5: 运算符与函数

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 示例 | 代码 | 示例 | 代码 | 示例 | 代码 |
|  | \sum |  | \prod |  | x\cdot{y} |
|  | \bigcup |  | \bigoplus |  | x\times {y} |
|  | \bigvee |  | \bigcap |  | \*\*\left\ |
|  | \bigwedge |  | \biguplus |  | \iiint |
|  | \bigotimes |  | \oint |  | \iint |
| $\int x\,{\rm d}x$ | \int x\,{\rm d}x |  | \bigsqcup |  | \lgroup \rgroup |
|  | \coprod |  | \bigodot |  | \partial |
|  | **\det** |  | \max |  | \min |
|  | \log |  |  |  |  |

### 表 6: 常用箭头

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 示例 | 代码 | 示例 | 代码 | 示例 | 代码 |
|  | \leftarrow |  | \rightarrow |  | \leftrightarrow |
|  | \longleftarrow |  | \longrightarrow |  | \longleftrightarrow |
|  | \Leftarrow |  | \Rightarrow |  | \Leftrightarrow |
|  | \Longleftarrow |  | \Longrightarrow |  | \Longleftrightarrow |
|  | \uparrow |  | \downarrow |  | \updownarrow |

### 表 7: 其他常用符号

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 示例 | 代码 | 示例 | 代码 | 示例 | 代码 |
|  | \therefore |  | \because |  | \min \limits\_{f \in {H}} |
|  | \leqslant |  | \geqslant | $\cal {C} \equiv 1$ | \equiv |
| $\thickapprox$ | \thickapprox | $\thicksim \sim$ | \thicksim \sim |  | \left(\frac{A}{B}\right) |
|  | \neq |  | \in |  | \hat{=} |
|  | \pm |  | \sqrt{a} |  | \geq \leq |
|  | **\perp** |  | \angle |  | \varpropto |
|  | \infty |  | g^\prime |  | \forall |
| $\exist$ | \exist |  | **\bot** |  | **\top** |

注意**\bot**和**\perp**的区别，垂直是**\perp**

### 表8: 使用字体

|  |  |  |
| --- | --- | --- |
| 示例 | 代码 | 备注 |
| $\rm {ABCdefxyzXYZ123}$ | \rm {ABCdefXYZ123} | 罗马体 |
| $\it{ABCdefxyzXYZ123}$ | \it{ABCdefXYZ123} | 意大利体 |
| $\bf{ABCdefxyzXYZ123}$ | \bf{ABCdefXYZ123} | 正粗体，黑体 |
| $\cal {ABCdefxyzXYZ123}$ | \cal {ABCdefXYZ123} | 花体 |
| $\sf{ABCdefXYZ123}$ | \sf{ABCdefXYZ123} | 等线体 |
| $\mit{ABCdefxyzXYZ123}$ | \mit{ABCdefXYZ123} | **数字斜体** |
| $\tt{ABCdefxyzXYZ123}$ | \tt{ABCdefXYZ123} | 打印机字体 |

### 表9: 分段函数与公式对齐

#### 分段函数

示例

# 代码  
f(x,y) = \begin{cases}  
1 & x与y满足某一事实\\  
0 & 否则  
\end{cases}

#### 对齐控制

# 代码  
# 通过\begin{aligned}\end{aligned}控制对齐, 使用&表示对齐点.  
\begin{aligned}  
L(w)&=\sum\limits^{N}\_{i=1}[y\_i\log\pi(x\_i)+(1-y\_i)\log(1-\pi(x\_i))]\\  
&=\sum\limits^{N}\_{i=1}[y\_i\log{\frac{\pi(x\_i)}{1-\pi(x\_i)}}+\log(1-\pi(x\_i))]\\  
&=\sum\limits^{N}\_{i=1}[y\_i(w\cdot x\_i)-\log(1+\exp(w\cdot{x\_i})]  
\end{aligned}

另外注意到前面的分段函数自动变好了，但是上面多行对齐的公式没有自动编号，如果需要**自动**编号，外面嵌入equation

代码如下

\begin{equation}  
\begin{aligned}  
L(w)&=\sum\limits^{N}\_{i=1}[y\_i\log\pi(x\_i)+(1-y\_i)\log(1-\pi(x\_i))]\\&=\sum\limits^{N}\_{i=1}[y\_i\log{\frac{\pi(x\_i)}{1-\pi(x\_i)}}+\log(1-\pi(x\_i))]\\&=\sum\limits^{N}\_{i=1}[y\_i(w\cdot x\_i)-\log(1+\exp(w\cdot{x\_i})]  
\end{aligned}  
\end{equation}

#### 公式编号

关于编号也可以通过行间公式做如下表达

代码如下

\begin{align}  
L(w)&=\sum\limits^{N}\_{i=1}[y\_i\log\pi(x\_i)+(1-y\_i)\log(1-\pi(x\_i))]\\  
&=\sum\limits^{N}\_{i=1}[y\_i\log{\frac{\pi(x\_i)}{1-\pi(x\_i)}}+\log(1-\pi(x\_i))]\nonumber\\  
&=\sum\limits^{N}\_{i=1}[y\_i(w\cdot x\_i)-\log(1+\exp(w\cdot{x\_i})]  
\end{align}

以上代码有两点需要注意体会：

1. align
2. \nonumber的使用

### 表X: 矩阵

#### 普通矩阵

\begin{aligned}  
M\_1(x)=  
\begin{bmatrix}  
&a\_{01}&a\_{02}\\  
&0&0  
\end{bmatrix}  
&,M\_2(x)=  
\begin{bmatrix}  
&b\_{11}&b\_{12}\\  
&b\_{21}&b\_{22}  
\end{bmatrix}  
\\  
M\_3(x)=  
\begin{bmatrix}  
&c\_{11}&c\_{12}\\  
&c\_{21}&c\_{22}  
\end{bmatrix}  
&,M\_4(x)=  
\begin{bmatrix}  
&1&0\\  
&1&0  
\end{bmatrix}  
\end{aligned}

#### 带省略符号的Matrix

$$X^\mathrm T= \left[ \begin{matrix} x\_{11} & \cdots & x\_{1N} \\ \vdots & \ddots & \vdots \\ x\_{M1} & \cdots & x\_{MN} \\ \end{matrix} \right]$$

% 这里稍微注意下转置符号， 《统计学习方法》中的转置用的是正体的T  
% 可以参考 https://zhuanlan.zhihu.com/p/27490955 中关于转置写法的讨论。  
X^\mathrm T=  
\left[  
\begin{matrix}  
 x\_{11} & \cdots & x\_{1N} \\  
 \vdots & \ddots & \vdots \\  
 x\_{M1} & \cdots & x\_{MN} \\  
\end{matrix}  
\right]

#### 向量

\left[  
\begin{array}  
\\2  
\\3  
\end{array}  
\right]

\overbrace{abcde}\underbrace{fghij}\_{comment}\overline{klmn}\underline{opqr}\overleftarrow{stuv}\overrightarrow{wxyz}

## Emoji

### 表XI: Emoji

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 😏 smirk | 😄smile | 😆laughing | 😊blush | 😃smiley | 😍heart\_eyes |
| 😘kissing\_heart | 😉wink | 😗kissing | 😕confused | 😓sweat | 😂joy |
| 😭sob | 😢cry | 😠angry | 😋yum | 😷mask | 😎sunglasses |
| 💗heartpulse | 👽alien | 💘cupid | 👍+1 | 🇨🇳cn | 💩shit |

## Refs

1. [Markdown 数学符号速查](https://www.cnblogs.com/blog4ljy/p/9066624.html)
2. [Cmd Markdown公式指导手册](https://www.zybuluo.com/codeep/note/163962)
3. [Equals\_Sign](https://en.wikipedia.org/wiki/Equals_sign#Other_related_symbols)
4. [Emoji](https://gist.github.com/rxaviers/7360908)
5. [Short Math Guide for LaTeX](http://ctan.math.utah.edu/ctan/tex-archive/info/short-math-guide/short-math-guide.pdf)
6. [List of Mathematical Symbols](https://en.wikipedia.org/wiki/List_of_mathematical_symbols)
7. [数学公式](https://zh.wikipedia.org/wiki/Help:数学公式)
8. [Matplotlib Math Text](https://matplotlib.org/tutorials/text/mathtext.html)