Hello World!

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Hello World! Today I am learning LaTeX. LaTeX is a great program for writing math.I can write in line math such as $a^2 + b^2 = c^2$. I can also give equations there own space:

$$\gamma^2 + \theta^2 = \omega^2$$

Integrals, Sums and Limits

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1 Integrals

Integral $\int_a^b x^2 dx$ inside text.
The same integral on display:

$$\int_a^b x^2 dx$$

and multiple integrals:

$$\iint_V \mu(u,v)\,du\,dv$$

$$\iiint_V \mu(u,v,w)\,du\,dv\,dw$$

$$\oint_V f(s) ds$$

2 Sums and products

Sum $\sum_{n=1}^{\infty} 2^{-n} = 1$ inside text.
The same sum on display:

$$\sum_{n=1}^{\infty} 2^{-n} = 1$$

Product $\prod_{i=a}^{b} f(i)$ inside text.
The same product on display:

$$\prod_{i=a}^{b} f(i)$$

3 Limits

Limit $\lim_{x\to\infty} f(x)$ inside text.
The same limit on display:

$$\lim_{x\to\infty} f(x)$$

Equations

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1 Maxwell's Equations

"Maxwell's equations" are named for James Clark Maxwell and are as follow:

$$\vec{\nabla} \cdot \vec{E} = \frac{\rho}{\epsilon_0} \quad \text{Gauss's Law} \tag{1}$$

$$\vec{\nabla} \cdot \vec{B} = 0 \quad \text{Gauss's Law for Magnetism} \tag{2}$$

$$\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t} \quad \text{Faraday's Law of Induction} \tag{3}$$

$$\vec{\nabla} \times \vec{B} = \mu_0 \left(\epsilon_0 \frac{\partial \vec{E}}{\partial t} + \vec{J} \right) \quad \text{Ampere's Circuital Law} \tag{4}$$

Equations 1, 2, 3, and 4 are some of the most important in Physics.

2 Matrix equation

$$\begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{pmatrix} \begin{bmatrix} v_1 \\ v_2 \\ \vdots \\ v_n \end{bmatrix} = \begin{matrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{matrix}$$

List of mathematical functions:

- **Trigonometric functions**
  - $\sin x$
  - $\cos x$
  - $\tan x$
- **Special functions**
  - Beta function

$$\beta(p,q) = \int_0^1 t^{p-1}(1-t)^{q-1}dt \mid p,q > 0$$

  - Gamma function

$$\Gamma(x) = \int_0^\infty t^{x-1}e^{-t}dt$$

  - Riemann zeta function

$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s}, s \in \mathbb{C}, n \in \mathbb{N}$$

Algorithm

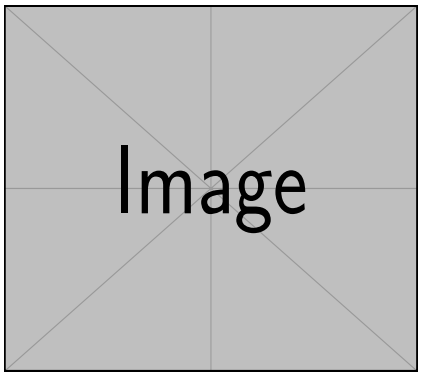
Algorithm 1: Example code

Input: Your Input
Output: Your output
Data: Testing set x

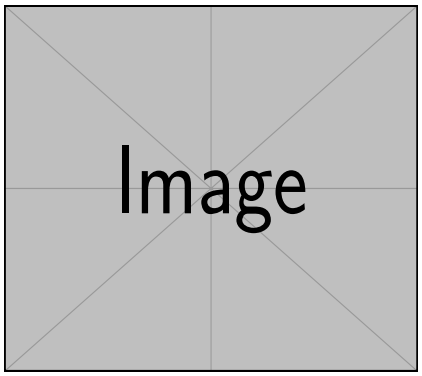
```
1  ∑_{i=1}^{∞} := 0                                   // this is a comment
   /* Now this is an if...else conditional loop                          */
2  if Condition 1 then
3  |  Do Something                                   // this is another comment
4  |  if sub-Condition then
5  |  |  Do a lot
6  else if Condition 2 then
7  |  Do Otherwise
   |  /* Now this is a for loop                                         */
8  |  for sequence do
9  |  |  loop instructions
10 else
11 |  Do the rest
   /* Now this is a While loop                                          */
12 while Condition do
13 |  Do something
```

col1	col2	col3
Multiple row	cell2 cell5 cell8	cell3 cell6 cell9

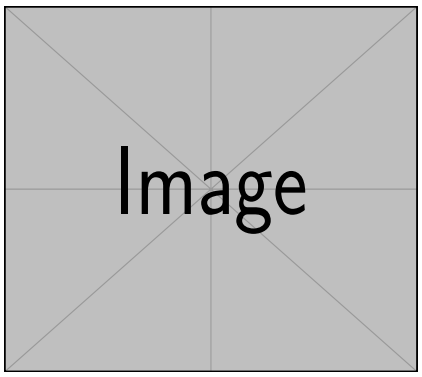
Country List		
Country Name or Area Name	ISO ALPHA 2 Code	ISO ALPHA 3
Afghanistan	AF	AFG
Aland Islands	AX	ALA
Albania	AL	ALB
Algeria	DZ	DZA
American Samoa	AS	ASM
Andorra	AD	ANA
Angola	AO	AGO



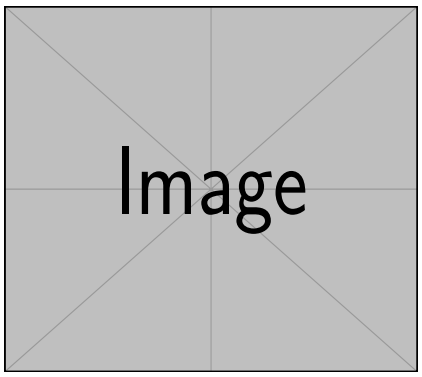
(a) First subfigure.



(b) Second subfigure.



(c) Third subfigure.



(d) Fourth subfigure.

Figure 1: This is a figure containing several subfigures in LaTeX.

In the text, you can refer to subfigures of figure 1 as 1a, 1b, 1c and 1d and to the sub-index as (a), (b), (c) and (d).

Contents

List of Tables

List of Figures

Referencing and Citing

This document is an example of `natbib` package using in bibliography management. Three items are cited: *The LaTeX Companion* book [2], the Einstein journal paper Einstein [1], and the Donald Knuth's website [3]. The LaTeX related items are [2, 3].

References

[1] A. Einstein. Zur Elektrodynamik bewegter Körper. (German) [On the electrodynamics of moving bodies]. *Annalen der Physik*, 322(10):891–921, 1905. doi: http://dx.doi.org/10.1002/andp.19053221004.

[2] M. Goossens, F. Mittelbach, and A. Samarin. *The LaTeX Companion*. Addison-Wesley, Reading, Massachusetts, 1993.

[3] D. Knuth. Knuth: Computers and typesetting. URL `http://www-cs-faculty.stanford.edu/~uno/abcde.html`.