

Typesetting System: T_EX

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Abstract

- What is T_EX
- Brief history
- What is L^AT_EX
- How it works
- Examples

What is T_EX

- 電子排版系統的出現
- T_EX – 優秀的電子排版系統



● Donald E. Knuth

Donald E. Knuth

- The author of the book “the Art of Computer Programming.”
- T_EX 是大寫的希臘字母 τ, ϵ, χ

Brief history

- Donald 對由電腦排版的校樣的低質量感到無法忍受
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- 現在幾乎所有的作業系統平臺下，都有相應的 TeX 軟體
- 版本號碼是 3.1415 新的版本就是再一位的 π

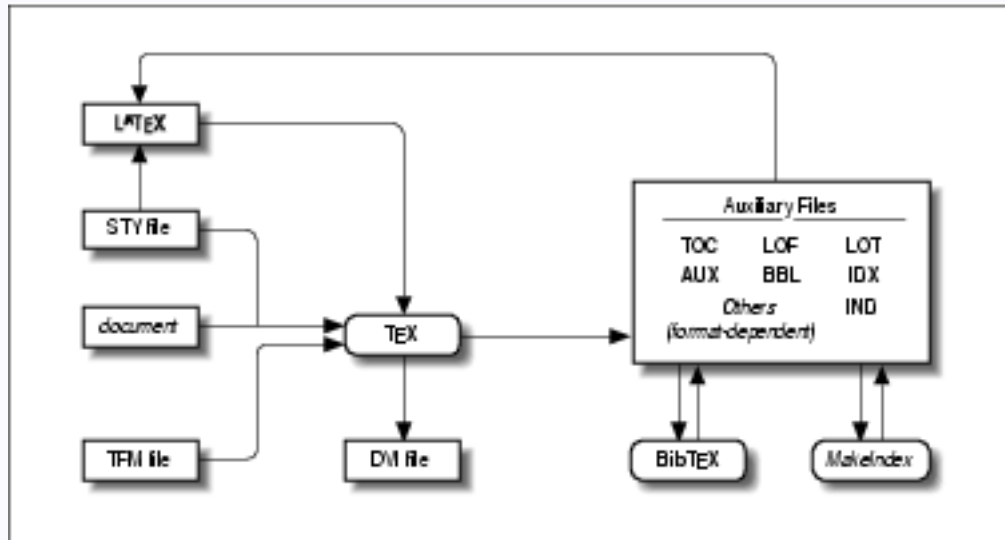
What is L^AT_EX

- L^AT_EX is a T_EX macro package, written by Leslie Lamport.
- L^AT_EX is supported by every journal and conference

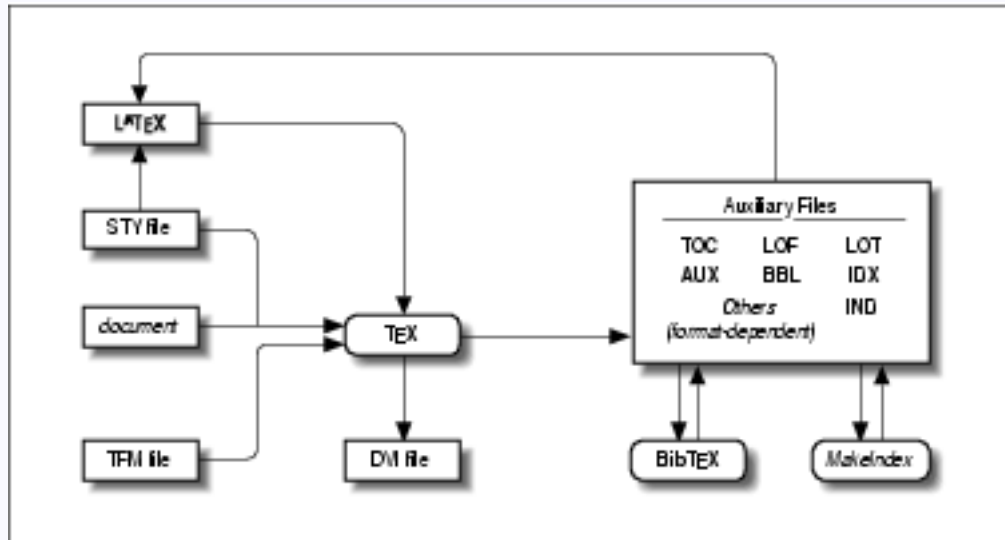
What is L^AT_EX

- L^AT_EX is a T_EX macro package, written by Leslie Lamport.
- L^AT_EX is supported by every journal and conference
- 强而有力的數學工具
- 美國數學協會 American Mathematical Society 的標準
- 除了用在出版，亦可以用於研究記錄等等

How it works

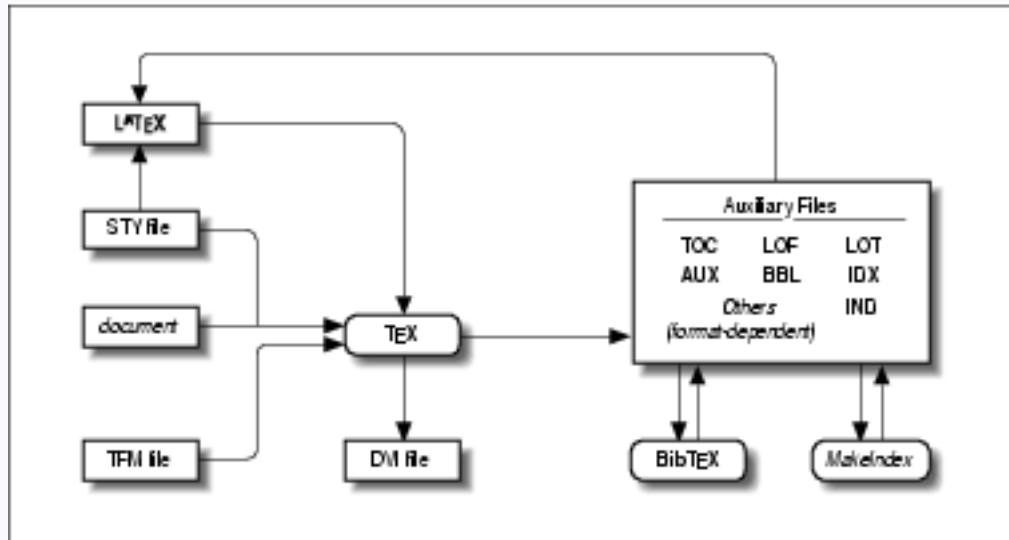


How it works



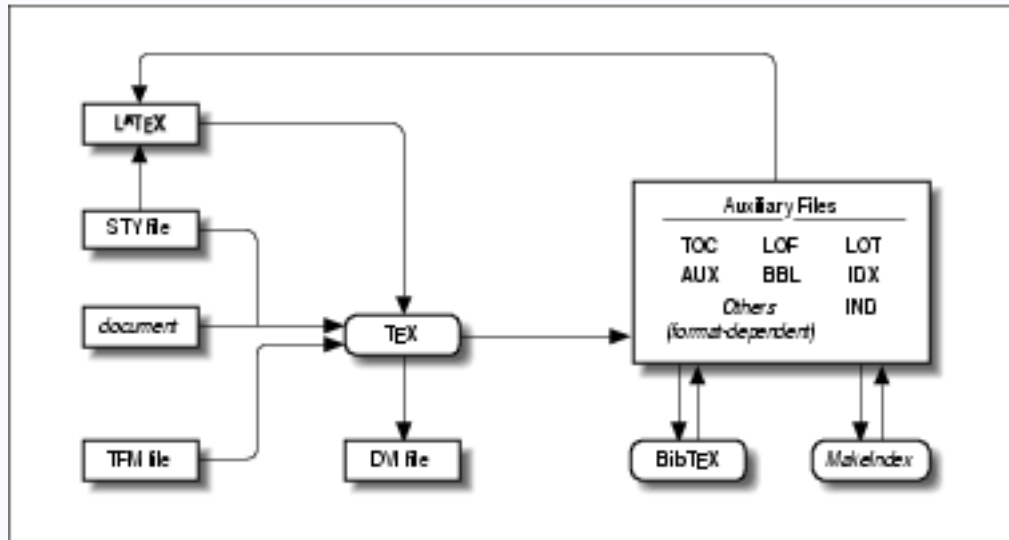
- Style files (*.sty , *.cls)

How it works



- Style files (*.sty , *.cls)
- Macro files (*.sty)

How it works



- Style files (`*.sty` , `*.cls`)
- Macro files (`*.sty`)
- Output: DVI(DeVice Independent) , PDF, PS files

Math

Here is the simple example:

```
\begin{equation}
  (A + B)^2 = A^2 + B^2 + 2AB
\end{equation}
```

We then get the output :

Math

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We then get the output :

$$(A + B)^2 = A^2 + B^2 + 2AB$$

Fraction: `\frac{numerator}{denominator}`

$$\frac{dy}{dx} = \frac{\frac{a}{x-y} + \frac{b}{x+y}}{1 + \frac{a-b}{a+b}}$$

We then get the output :

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We then get the output :

$$\frac{dy}{dx} = \frac{\frac{a}{x-y} + \frac{b}{x+y}}{1 + \frac{a-b}{a+b}}$$

Squire root: `\sqrt`

\$\$

`\sqrt[n]{\frac{x^n-y^n}{1+u^{2n}}}`

\$\$

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Square root: `\sqrt`

\$\$

```
\sqrt[n]{\frac{x^n - y^n}{1 + u^{2n}}}
```

\$\$

We then get the output :

$$\sqrt[n]{\frac{x^n - y^n}{1 + u^{2n}}}$$

Integration: `\int`

```
\begin{displaymath}
  \left(\int_{-\infty}^{\infty} e^{-x^2}\right)
  =\int_{-\infty}^{\infty}\int_{-\infty}^{\infty}
  e^{-(x^2+y^2)}dx,dy
\end{displaymath}
```

We then get the output :

Integration: \int

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\begin{displaymath}
  \left(\int_{-\infty}^{\infty} e^{-x^2}\right)
  =\int_{-\infty}^{\infty}\int_{-\infty}^{\infty}
  e^{-(x^2+y^2)}dx,dy
\end{displaymath}
```

We then get the output :

$$\left(\int_{-\infty}^{\infty} e^{-x^2}\right) = \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} e^{-(x^2+y^2)} dx dy$$

With the frame

```
\begin{equation}
  \fbox{$\displaystyle\int_0^{\infty} f(x)\,d{x}
  \approx\sum_{i=1}^{n}e^{x_i}f(x_i)$}
\end{equation}
```

We then get the output :

With the frame

```
\begin{equation}
  \fbox{$\displaystyle\int_0^{\infty} f(x)\,d{x}
  \approx\sum_{i=1}^{nw_i}{e^{x_i}f(x_i)}$}
\end{equation}
```

We then get the output :

$$\int_0^{\infty} f(x) dx \approx \sum_{i=1}^n w_i e^{x_i} f(x_i) \quad (1)$$

Display matrix

```
$$  
  \left(\matrix{1 & \cdots & 3\cr 2 & \vdots & 4\cr  
              3 & \ddots & 5}\right)  
$$
```

We then get the output :

Display matrix

```
$$  
  \left(\matrix{1 & \cdots & 3\cr 2 & \vdots & 4\cr 3 & \ddots & 5}\right)  
$$
```

We then get the output :

$$\begin{pmatrix} 1 & \cdots & 3 \\ 2 & \vdots & 4 \\ 3 & \ddots & 5 \end{pmatrix}$$

Cases

\$\$

```
\psi(x)=\cases{A{\rm e}^{\{\rm i\}kx}+B{\rm e}^{\{-\rm i\}kx},  
                & for $x=0$\cr  
                D{\rm e}^{-\{\kappa\}x}, & for $x=0$.}
```

\$\$

$$\psi(x) = \begin{cases} Ae^{ikx} + Be^{-ikx}, & \text{for } x = 0 \\ De^{-\kappa x}, & \text{for } x = 0. \end{cases}$$

Document format

List 包括三種

1. First level item
 - (a) Second level item
 - (b) Second level item
 - i. Third level item
 - A. Fourth level item
 - ii. Third level item
 - iii. Third level item
 - (c) Second level item
 - (d) Second level item
2. First level item
3. First level item

Document format

1. First level item
 - (a) Second level item
 - (b) Second level item
 - i. Third level item
 - A. Fourth level item
 - ii. Third level item
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 - (c) Second level item
 - (d) Second level item
2. First level item
3. First level item

List 包括三種 enumerate, itemize 及 description
enumerate 就是左邊這種樣式，itemize 則是投影片的樣式。description 則是以一個敘述當做開頭。如下：

Document format

1. First level item
 - (a) Second level item
 - (b) Second level item
 - i. Third level item
 - A. Fourth level item
 - ii. Third level item
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List 包括三種 `enumerate`, `itemize` 及 `description`
`enumerate` 就是左邊這種樣式，`itemize` 則是投影片的樣式。`description` 則是以一個敘述當做開頭。如下：

tex T_EX

latex L_AT_EX

latex2e L_AT_EX 2_ε

Table

Plan for T_EX Users Group 2001–2003

Project	No. <input type="text"/> <input type="text"/> <input type="text"/>		Name <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>			
Year	2001		2002		2003	
	Rs.	US\$	Rs.	US\$	Rs.	US\$
Internet costs						
Journal costs						
T _E XLive production costs						
Signature			Authorization			

Color Table

cyan (C):

.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
----	----	----	----	----	----	----	----	----	----

magenta (M):

.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
----	----	----	----	----	----	----	----	----	----

yellow (Y):

.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
----	----	----	----	----	----	----	----	----	----

black (K):

.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
----	----	----	----	----	----	----	----	----	----

Formatting

- Apply Style files
- 其他的排版功能介紹
 - Table Of Contents
 - Cross Reference
 - Footnote¹
 - Cite 標準的註解格式

¹這是一個註解

Special

- 用來製作樂譜、象棋譜

Why L^AT_EX ?

- 高品質的輸出
- 穩定及良好的通用性
- 高度的靈活性
- 特別在科學記號的表現上相當的方便
- Programmable

Why not ?

- 不是那麼容易學會
- 需要比較長的學習過程
- 不是所見即所得
- 不太適合用來做投影片 ;P

References

References

- [1] Making tex work.
<http://makingtexwork.sourceforge.net/mtw/>.
- [2] Tex user group. <http://www.tug.org/>.
- [3] Helmut Kopka & Patrick W. Daly. *A Guide to L^AT_EX 2_ε*. Addison–Wesley, second edition, 1995.
- [4] 吳聰敏，吳聰慧. *cwT_EX*. 翰蘆圖書, 2002.

- [5] Leslie Lamport. *A Document Preparation System – L^AT_EX*. Addison–Wesley, 2nd edition, 1994.
- [6] Michel Goossens & Frank Mittelbach & Alexander Samarin. *The L^AT_EX Companion*. Addison–Wesley, 1994.