

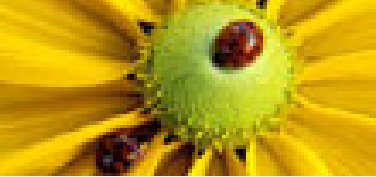
L^AT_EX

幕後排版系統

蘇漢毅

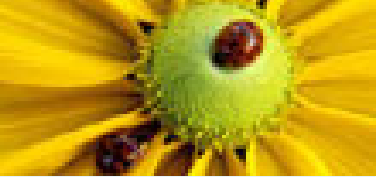
b9901134@ee.ntu.edu.tw

第十組

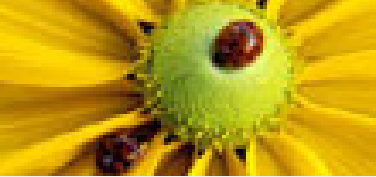


Outline

- Introduction
- Using \LaTeX
- Demo
- Special Application – Electronic Circuit
- Reference



Introduction



Classification of Typesetting

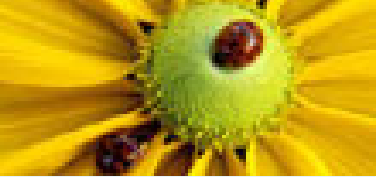
- 幕前排版

(What-You-See-Is-What-You-Get)

ex. Microsoft Office Word

- 幕後排版

ex. \LaTeX (\TeX = Tau Epsilon Chi, $\tau\epsilon\chi$)

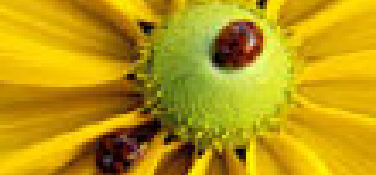


Why L^AT_EX?

- 品質

"The first goal was *quality*: we want to produce documents that were not just nice, but actually the best."

– Donald E. Knuth



Why L^AT_EX?

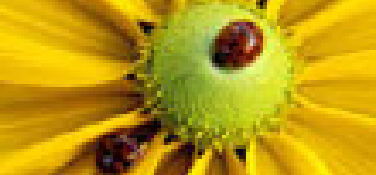
■ 品質

"The first goal was *quality*: we want to produce documents that were not just nice, but actually the best."

– Donald E. Knuth

■ 排版數學文稿

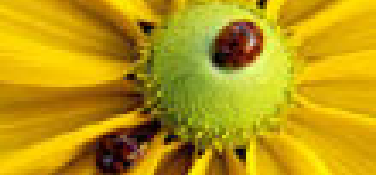
- ◆ 符號: α , β , ∞ , \Leftrightarrow , \overrightarrow{PQ} , \mathbb{R} , ...
- ◆ 式子: $\sum_{k=1}^n \frac{1}{k^2}$, $\frac{2}{\sqrt{\pi}} \int_a^{\infty} e^{-x^2} dx$, ...



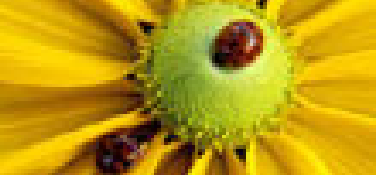
T_EX Systems

- T_EX: Knuth 發展之排版系統
- L^AT_EX: 巨集套件組合
- cwT_EX: 排版中文之程式及字型
- 不同作業系統上的 T_EX

T _E X 系統	作業系統
MiK _T _E X	Windows
fpT _E X	Windows
emT _E X	MS-DOS
teT _E X	Linux

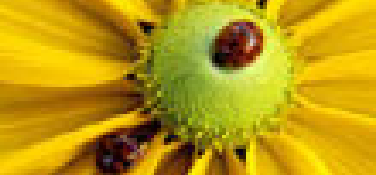


Using L^AT_EX



Installation

- Ghostscript — 將 .ps 轉成 .pdf
- GSView — 開啓 .ps 和 .pdf
- WinEdt — 整合 T_EX 的文字編輯器
- MiK_TE_X — Windows 上的 T_EX 系統
- cwT_EX — 中文排版



Basic Format

■ Sample File

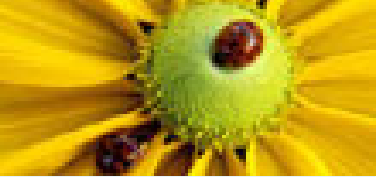
```
\documentclass[12pt]{article}
```

```
\begin{document}
```

以 \TeX 排版中文很容易;

數學式之排版, 如 $\sqrt{\beta}$, 尤其精確而且簡單。

```
\end{document}
```



Basic Format

■ Sample File

```
\documentclass[12pt]{article}
```

```
\begin{document}
```

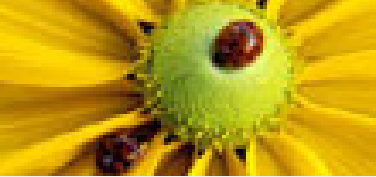
以 \TeX 排版中文很容易;

數學式之排版, 如 $\text{\$}\sqrt{\text{\beta}}\text{\$}$, 尤其精確而且簡單。

```
\end{document}
```

■ Run





Basic Format

■ Sample File

```
\documentclass[12pt]{article}
```

```
\begin{document}
```

以 \TeX 排版中文很容易;

數學式之排版, 如 $\text{\$}\sqrt{\text{\beta}}\text{\$}$, 尤其精確而且簡單。

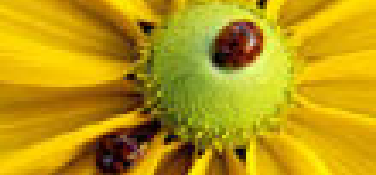
```
\end{document}
```

■ Run

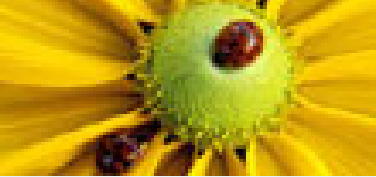


■ Result

以 \TeX 排版中文很容易; 數學式之排版, 如 $\sqrt{\beta}$, 尤其精確而且簡單。



Demo



Integral, Suffix, and Fraction

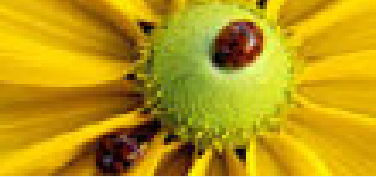
- Sample File

```
$f(t)=%
```

```
\frac{1}{2\pi}%
```

```
\int_{-\infty}^{\infty}%
```

```
F(\omega)e^{j\omega t}d\omega$
```



Integral, Suffix, and Fraction

■ Sample File

```
$f(t)=%  
\frac{1}{2\pi}%  
\int_{-\infty}^{\infty}%  
F(\omega)e^{j\omega t}d\omega$
```

■ Result

$$f(t) = \frac{1}{2\pi} \int_{-\infty}^{\infty} F(\omega) e^{j\omega t} d\omega$$



Array

■ Sample File

```
\[
A = \left[
\begin{array}{ccc}
a+b & ab & a \\
c+a & ca & abc
\end{array}
\right]
```



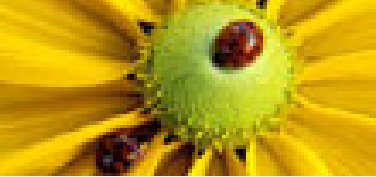

Array

■ Sample File

```
\[  
A = \left[  
  \begin{array}{ccc}  
a+b & ab & a \\ c+a & ca & abc \\ \end{array}  
  \end{array}  
  \right]  
\]
```

■ Result

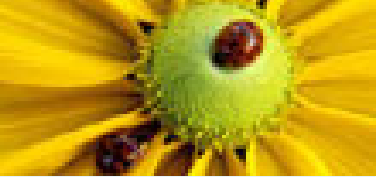
$$A = \begin{bmatrix} a + b & ab & a \\ c + a & ca & abc \end{bmatrix}$$



Chapter and Section

■ Sample File

```
\documentclass[12pt]{book}  
\begin{document}  
\chapter{The Real Line and Euclidean Space}  
\section{Orderd Fields and the Number Systems}  
\subsection{Law of Trichotomy}  
\end{document}
```



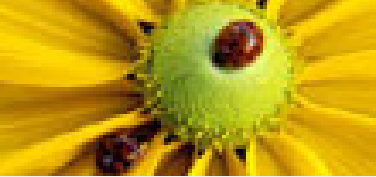
Chapter and Section

■ Sample File

```
\documentclass[12pt]{book}  
\begin{document}  
\chapter{The Real Line and Euclidean Space}  
\section{Orderd Fields and the Number Systems}  
\subsection{Law of Trichotomy}  
\end{document}
```

■ Result

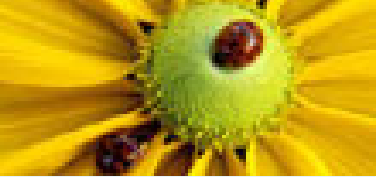
Chapter 1
The Real Line and Euclidean Space
1.1 Orderd Fields and the Number Systems
1.1.1 Law of Trichotomy



Two Column – minipage

- Sample File

```
\fbox{  
\begin{minipage}{4cm}  
Left Column  
\end{minipage}  
\begin{minipage}{4cm}  
Right Column  
\end{minipage}  
}
```



Two Column – minipage

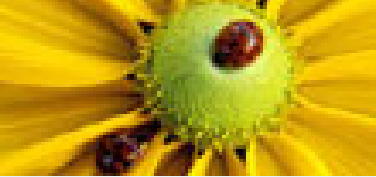
■ Sample File

```
\fbox{  
\begin{minipage}{4cm}  
Left Column  
\end{minipage}  
\begin{minipage}{4cm}  
Right Column  
\end{minipage}  
}
```

■ Result

This is the left column (the first minipage).

This is the right column (the second minipage).

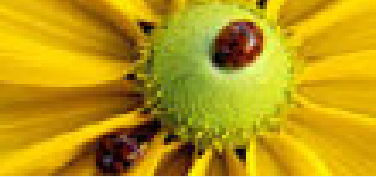


Table

■ Sample File

```
\begin{tabular}{cl}  
\toprule  
\TeX\ 系統 & 作業系統\\  
\midrule  
MiK\TeX & Windows\\  
em\TeX & MS-DOS\\  
te\TeX & Linux\\  
\bottomrule  
\end{tabular}\hspace{2cm}
```

```
\begin{tabular}{|c||}  
\hline  
\TeX\ 系統 & 作業系統\\  
\hline  
MiK\TeX & Windows\\  
em\TeX & MS-DOS\\  
te\TeX & Linux\\  
\hline  
blue\end{tabular}
```



Table

■ Sample File

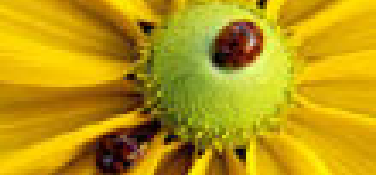
```
\begin{tabular}{cl}  
\toprule  
\TeX\ 系統 & 作業系統 \\ \\  
\midrule  
MiK\TeX & Windows \\ \\  
em\TeX & MS-DOS \\ \\  
te\TeX & Linux \\ \\  
\bottomrule  
\end{tabular}\hspace{2cm}
```

```
\begin{tabular}{|c||}  
\hline  
\TeX\ 系統 & 作業系統 \\ \\  
\hline  
MiK\TeX & Windows \\ \\  
em\TeX & MS-DOS \\ \\  
te\TeX & Linux \\ \\  
\hline  
blue\end{tabular}
```

■ Result

TEX 系統	作業系統
MiKTEX	Windows
emTEX	MS-DOS
teTEX	Linux

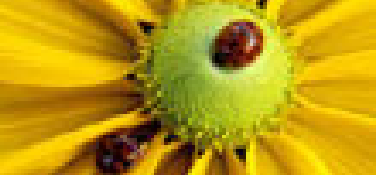
TEX 系統	作業系統
MiKTEX	Windows
emTEX	MS-DOS
teTEX	Linux



itemize, enumerate and description

■ Sample File

```
\begin{itemize}
\item item 1
\begin{itemize}
\item item 1.1
\end{itemize}
\item item 2
\begin{enumerate}
\item item 2.1 \item item 2.2
\end{enumerate}
\item item 3
\begin{description}
\item 甲、 item 3.1
\item 乙、 item 3.2
\end{description}
\end{itemize}
```

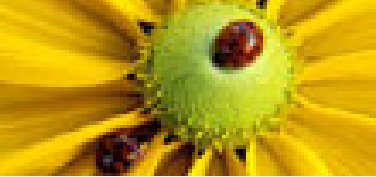
itemize, enumerate and description

■ Sample File

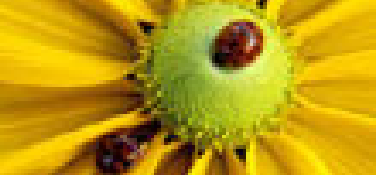
```
\begin{itemize}
\item item 1
\begin{itemize}
\item item 1.1
\end{itemize}
\item item 2
\begin{enumerate}
\item item 2.1 \item item 2.2
\end{enumerate}
\item item 3
\begin{description}
\item 甲、 item 3.1
\item 乙、 item 3.2
\end{description}
\end{itemize}
```

■ Result

- ◆ item 1
 - item 1.1
- ◆ item 2
 1. item 2.1
 2. item 2.2
- ◆ item 3
 - 甲、 item 3.1
 - 乙、 item 3.2

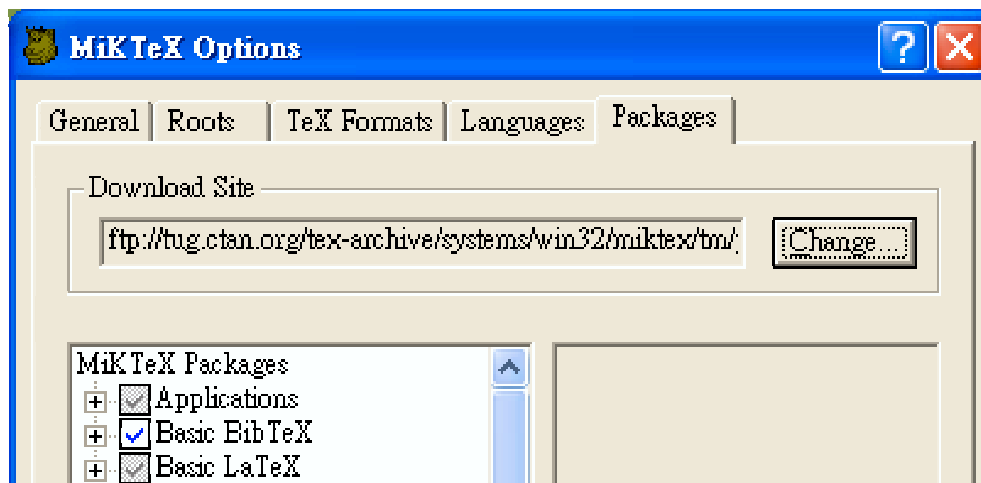


Special Application – Electronic Circuit



Install PSTricks

- MiKTeX → MiKTeX Options → Packages
- Change... → Internet → 選擇下載位置
- Right Click → Search... → PSTricks





pst-circ – Resistor

■ Sample File

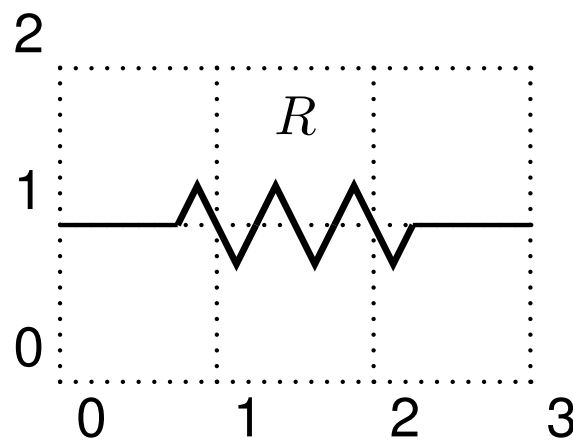
```
\usepackage{pst-circ}  
\begin{document}  
\begin{pspicture}(0,0)(3,2)  
\psgrid[subgriddiv=1,griddots=10]  
\pnode(1,1){A} \pnode(3,1){B}  
\resistor[dipolestyle=zigzag](A)(B){$R$}  
\end{pspicture}  
\end{document}
```

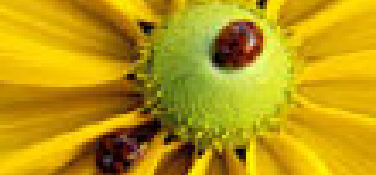
pst-circ – Resistor

■ Sample File

```
\usepackage{pst-circ}
\begin{document}
\begin{pspicture}(0,0)(3,2)
\psgrid[subgriddiv=1,griddots=10]
\pnode(1,1){A} \pnode(3,1){B}
\resistor[dipolestyle=zigzag](A)(B){$R$}
\end{pspicture}
\end{document}
```

■ Result

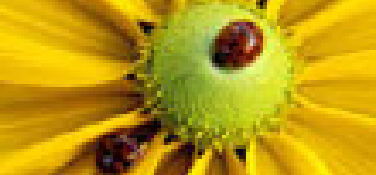




pst-circ – Capacitor

■ Sample File

```
\begin{pspicture}(0,0)(3,2)
\psgrid[subgriddiv=1,griddots=10]
\pnode(1,1){A} \pnode(3,1){B}
\capacitor[dipolestyle=chemical](A)(B){$C$}
\end{pspicture}
```

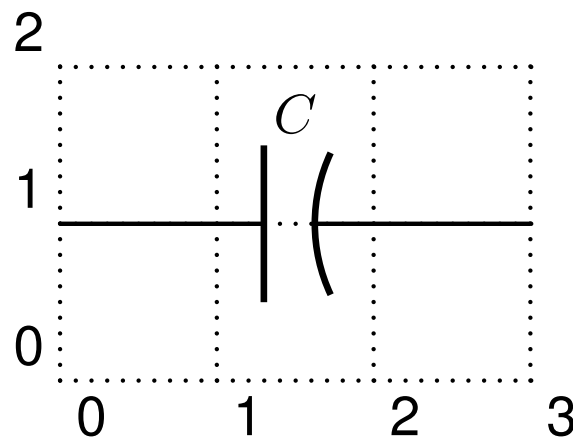


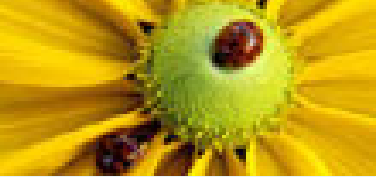
pst-circ – Capacitor

■ Sample File

```
\begin{pspicture}(0,0)(3,2)
\psgrid[subgriddiv=1,griddots=10]
\pnode(1,1){A} \pnode(3,1){B}
\capacitor[dipolestyle=chemical](A)(B){$C$}
\end{pspicture}
```

■ Result





pst-circ – Inductor

■ Sample File

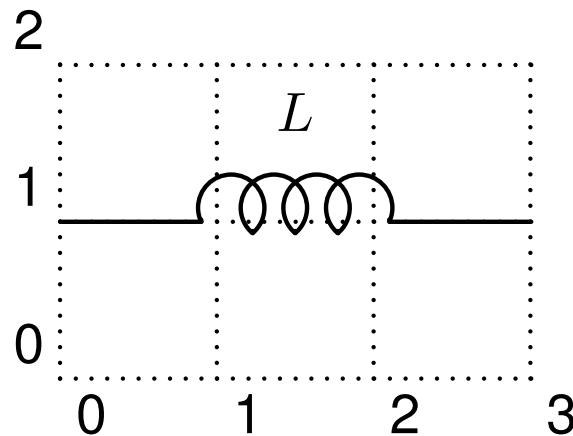
```
\begin{pspicture}(0,0)(3,2)
\psgrid[subgriddiv=1,griddots=10]
\pnode(1,1){A} \pnode(3,1){B}
\coil[dipolestyle=elektorcurved](A)(B){$L$}
\end{pspicture}
```


pst-circ – Inductor

■ Sample File

```
\begin{pspicture}(0,0)(3,2)
\psgrid[subgriddiv=1,griddots=10]
\pnode(1,1){A} \pnode(3,1){B}
\coil[dipolestyle=elektorcurved](A)(B){$L$}
\end{pspicture}
```

■ Result

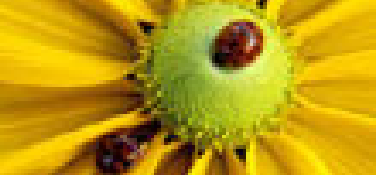




pst-circ – Wire

■ Sample File

```
\begin{pspicture}(0,0)(2,2)
\psgrid[subgriddiv=1,griddots=10]
\pnode(1,0){A} \pnode(1,2){B}
\pnode(0,1){C} \pnode(2,1){D}
\wire(A)(B)
\wire[intersect,intersectA=A,intersectB=B](C)(D)
\end{pspicture}
```

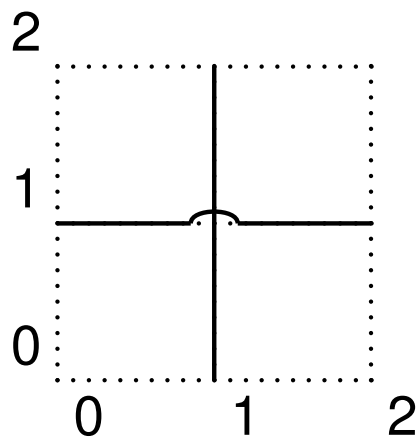


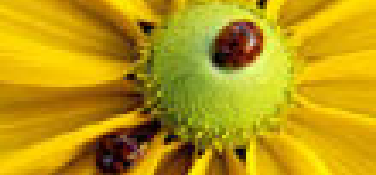
pst-circ – Wire

■ Sample File

```
\begin{pspicture}(0,0)(2,2)
\psgrid[subgriddiv=1,griddots=10]
\pnode(1,0){A} \pnode(1,2){B}
\pnode(0,1){C} \pnode(2,1){D}
\wire(A)(B)
\wire[intersect,intersectA=A,intersectB=B](C)(D)
\end{pspicture}
```

■ Result

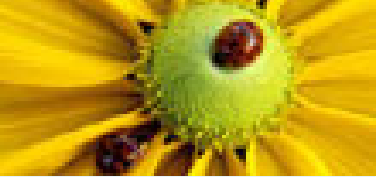




pst-circ – OP

■ Sample File

```
\begin{pspicture}(0,0)(4,3)
\psgrid[subgriddiv=1,griddots=10]
\pnode(0,0){A} \pnode(0,3){B}
\pnode(4,1.5){C}
\OA(B)(A)(C)
\end{pspicture}
```

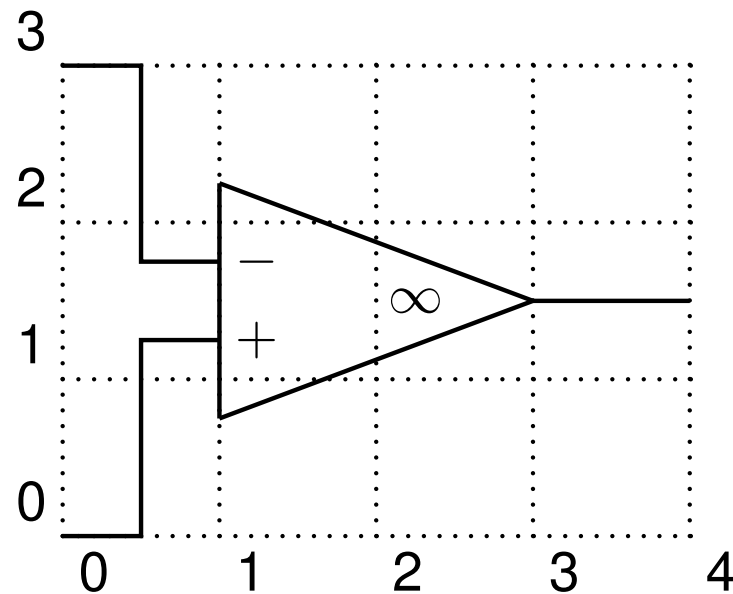


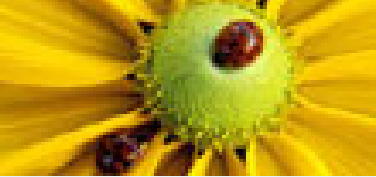
pst-circ – OP

■ Sample File

```
\begin{pspicture}(0,0)(4,3)
\psgrid[subgriddiv=1,griddots=10]
\pnode(0,0){A} \pnode(0,3){B}
\pnode(4,1.5){C}
\OA(B)(A)(C)
\end{pspicture}
```

■ Result

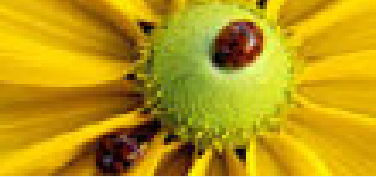




pst-circ – Transformer

- Sample File

```
\pnode(0,4){A} \pnode(0,0){B}  
\pnode(4,4){C} \pnode(4,0){D}  
\transformer(A)(B)(C)(D)
```

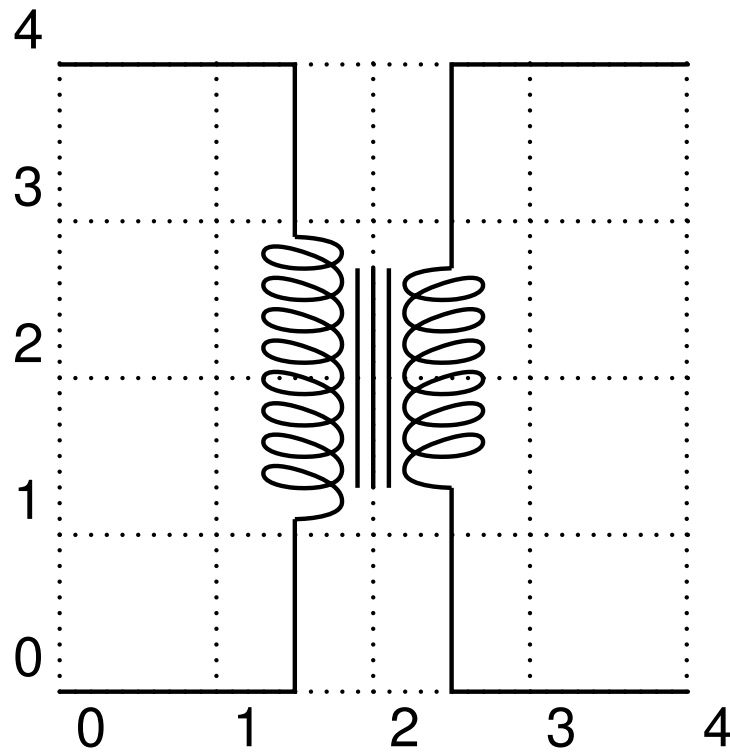


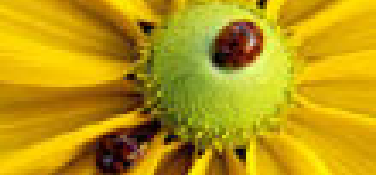
pst-circ – Transformer

■ Sample File

```
\pnode(0,4){A} \pnode(0,0){B}  
\pnode(4,4){C} \pnode(4,0){D}  
\transformer(A)(B)(C)(D)
```

■ Result





References

- **cwTeX 排版系統**

<ftp://ftp1.sinica.edu.tw/pub2/tex/cwTeX/cxbook.pdf>

- **HA-prosper — 排版投影片的 package**

<http://stuwww.uvt.nl/~hendri/index1.html>

- **PSTricks — 繪圖及顏色相關的 package**

<http://www.tug.org/applications/PSTricks/>

- **pst-circ — 畫電路元件**

<http://www.ctan.org/tex-archive/graphics/pstricks/contrib/pst-circ/>