TEX Summary & Best Practice

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Contents

1 *listings* package

2020-05-01: first update

1.1 Package settings

```
\lstset{
  basicstyle=\ttfamily,
  columns=fullflexible,
  frame=single,
  breaklines=true,
  postbreak=\mbox{\textcolor{red}{$\hookrightarrow$}\space},
}
```

1.2 Examples

```
\begin{enumerate}
    \item \href{https://mirror.foobar.to/CTAN/macros/latex/contrib/listings/listings.pdf}{
        ↪ The Listings Package mamual}
\end{enumerate}
```

1.3 Useful links

1. The Listings Package

   2020/03/24 Version 1.8d

2. LaTeX/Source Code Listings - Wikibooks

3. lstlisting line wrapping - stackexchange

   adding line break for *listings* package

2 Ti*k*Z package

2020-05-01: first update

2.1 Package settings

1. TikZ library

   ```
   \usepackage{tikz}
   \usetikzlibrary{shapes.geometric, arrows}
   ```

   For more details, please refer to List of available TikZ libraries with a short introduction - stackexchange.

2. `tikzstyle`

   Theis command could be used to define the basic components of a flowchart, which is discussed in detail in Section 2.2.2.

2.2 Examples

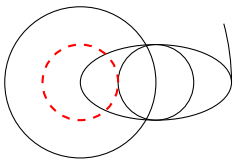
2.2.1 Basic shapes

1. drawing a square

```
\begin{tikzpicture}
    %% line
    \draw (0,0) -- (0,2) -- (2,2) -- (2,0) -- (0,0);
    % end in the start to form a cycle
    \draw (0,0) -- (0,2) -- (2,2) -- (2,0) -- cycle;
    % use the rectangle keyword to simplify
    \draw (0,0) rectangle (1,1);
    %% parabola
    \draw (0,0) parabola (1,1);
    % add control points
    \draw (0,0) .. controls (0,1) and (1,0) .. (1,1);
\end{tikzpicture}
```

2. draw a circle/ellipse/arc with line style

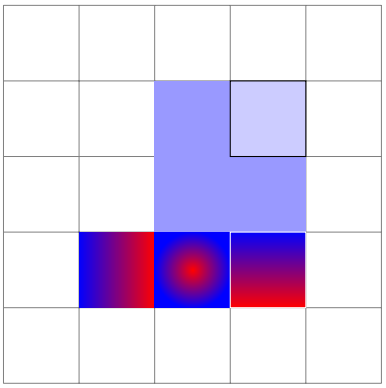
```
\begin{tikzpicture}
     % center and radius
    \draw (1,1) circle (1cm);
    \draw (2,1) circle (0.5cm);
    % center and semi-axis in x/y
    \draw (2,1) ellipse (1cm and 0.5cm);
    % start point and (start:end:radius)
    \draw (2,1) arc (0:30:2cm)
    % line style
    \draw[red,thick,dashed] (1,1) circle (0.5cm);
\end{tikzpicture}
```



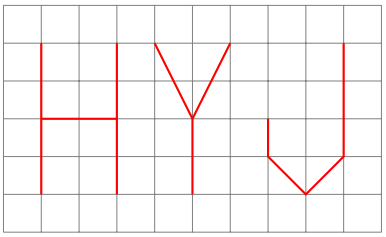
3. Grids with filling

```
\begin{tikzpicture}
    %% grid
    % bottom-left -> top-right
    \draw[step=1cm,gray,very thin] (-2,-2) grid (3,3);
    %% color filling
    \fill[blue!40!white] (0,0) rectangle (2,2); % 40% blue mixed with 60% white
    %% fill with border
    \filldraw[blue!20!white, draw=black] (1,1) rectangle (2,2);
    %% fill with color gradient
    % left/right/top/bottom/inner/outer color
    \shade[left color=blue, right color=red] (-1,-1) rectangle (0,0);
    \shade[outer color=blue, inner color=red] (0,-1) rectangle (1,0);
    %% fill with color gradient and border
```

```
    \shadedraw[top color=blue,bottom color=red, draw=white] (1,-1) rectangle (2,0);
\end{tikzpicture}
```



4. combining line and grid



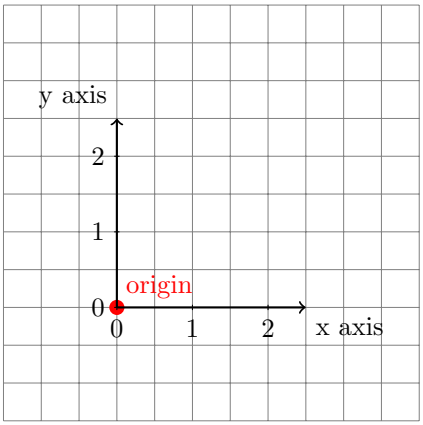
5. Axes with text

```
\begin{tikzpicture}
    %% grid
    \draw[step=0.5cm,gray,very thin] (-1.5,-1.5) grid (4,4);
    \fill[red] (0,0) circle (0.1cm);

    %% Axes
    \draw[thick,->] (0,0) -- (0,2.5);
    \draw[thick,->] (0,0) -- (2.5,0);

    % label our axes using nodes
    \draw[thick,->] (0,0) -- (2.5,0) node[anchor=north west] {x axis};
    \draw[thick,->] (0,0) -- (0,2.5) node[anchor=south east] {y axis};

    % add in ticks and numbering
    \foreach \x in {0,1,2}
        \draw (\x cm,1pt) -- (\x cm,-1pt) node[anchor=north] {$\x$};
    \foreach \y in {0,1,2}
        \draw (1pt,\y cm) -- (-1pt,\y cm) node[anchor=east] {$\y$};
\end{tikzpicture}
```



2.2.2 Creating flowchart

1. define block style

```
\tikzstyle{startstop} = [rectangle, rounded corners, minimum width=3cm, minimum height
    ↪ =1cm,text centered, draw=black, fill=red!30]
\tikzstyle{io} = [trapezium, trapezium left angle=70, trapezium right angle=110,
    ↪ minimum width=3cm, minimum height=1cm, text centered, draw=black, fill=blue!30]
\tikzstyle{process} = [rectangle, minimum width=3cm, minimum height=1cm, text centered,
    ↪  draw=black, fill=orange!30]
\tikzstyle{decision} = [diamond, minimum width=3cm, minimum height=1cm, text centered,
    ↪ draw=black, fill=green!30]
\tikzstyle{arrow} = [thick,->,>=stealth]
```

2. add nodes

3. connect with arrows

to be updated

2.2.3 Creating TikZ from GeoGebra

to be updated

2.3 Useful links

1. The TikZ and PGF Packages

   Manual for version 3.1.8b, December 27, 2020

2. LaTeX Graphics using TikZ: A Tutorial for Beginners - Overleaf

   Part 1-Basic Drawing; Part 2-Generating TikZ Code from GeoGebra; Part 3-Creating Flowcharts

3. List of available TikZ libraries with a short introduction - stackexchange

3 *graphicx* package

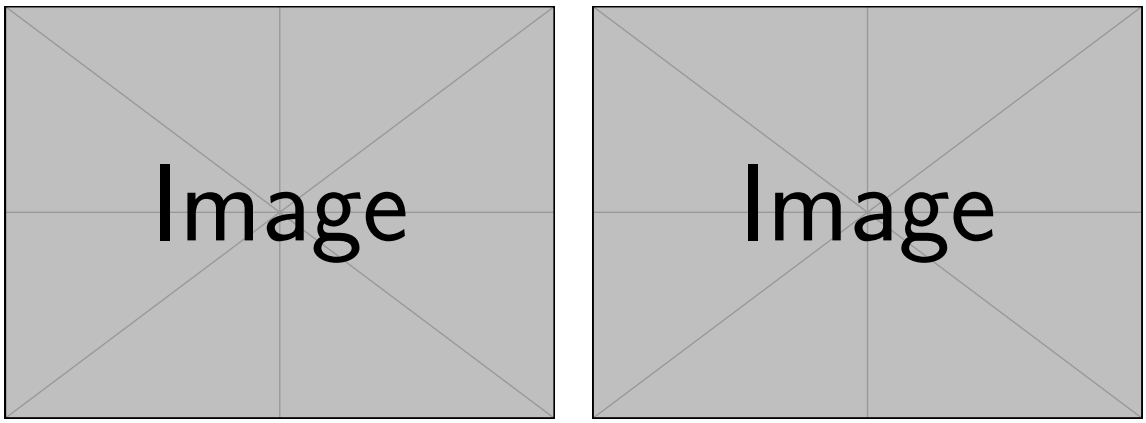
2020-05-01: first update

3.1 Examples

3.2 Specical case

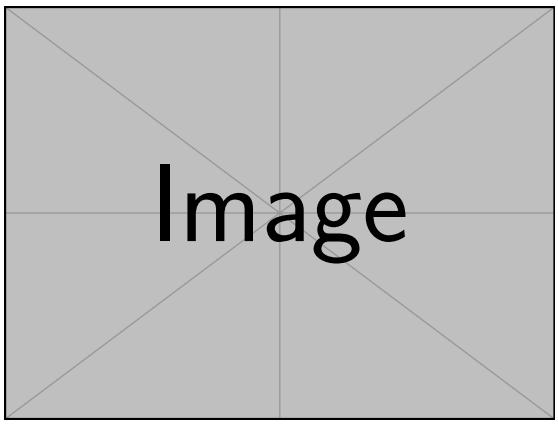
1. Splitting subfigure across multiple pages

```
\begin{figure}[b]
    \begin{subfigure}[t]{0.45\hsize}
        \includegraphics[width=0.95\linewidth]{example-image}
        \caption{}
    \end{subfigure}
    \begin{subfigure}[t]{0.45\hsize}
        \includegraphics[width=0.95\linewidth]{example-image}
        \caption{}
    \end{subfigure}
    \caption{first part of my figure}
\end{figure}
\clearpage
\begin{figure}[tb]\ContinuedFloat
    \begin{subfigure}[t]{0.45\hsize}
        \includegraphics[width=0.95\linewidth]{example-image}
        \caption{}
    \end{subfigure}
    \begin{subfigure}[t]{0.45\hsize}
        \includegraphics[width=0.95\linewidth]{example-image}
        \caption{}
    \end{subfigure}
    \caption{second part of my figure}
\end{figure}
```

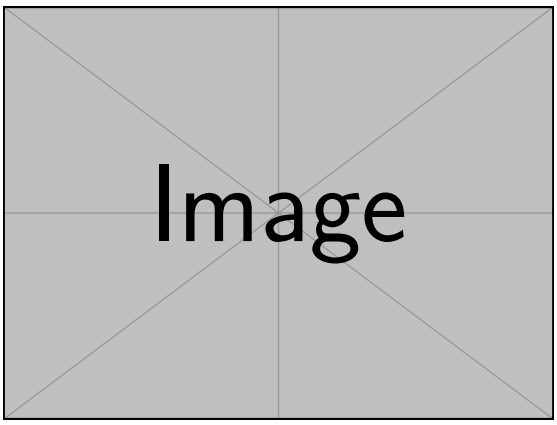


(a) (b)

Figure 1: first part of my figure



(c)



(d)

Figure 1: second part of my figure

3.3 Useful links

1. The graphicx package mamual
   Version: 2020/09/09
2. Splitting Subfigure across multiple pages - stackexchange

4 Misc.

1. version control with `.gitignore`
    - https://github.com/github/gitignore/blob/master/TeX.gitignore
    - Yujie's customization: https://github.com/hibetterheyj/yujiehe-gitignore/blob/master/TeX.gitignore

5 To-do lists

1. adding useful `newcommand`
2. difference between *xcolor* and *color* package
3. difference between *subfig* and *subfigure* package and best practice to use sub-figures
4. best practice for href and url package
5. adding bibiligrahy in the LaTeX
6. adding emoji in LaTeX
7. propose a `.sty` for personal use
8. add reference section
9. highlight with *soul* using different colors