

LaTeX eBook



≡ Examples

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1 Math Tips

1.1 Auto-resizing equation

$$\dot{\rho} = \frac{x^3}{45a^9 - 23b}$$

```
\documentclass{article}
\usepackage{amsmath}
\usepackage{graphicx}

\begin{document}
\begin{equation*}\label{eq1}
\resizebox{.4\textwidth}{!}{ % change .4 to 0.5...
\$ \dot{\rho}=\frac{x^3}{45a^9-23b} \$}
\end{equation*}
\end{document}
```

1.2 Form for simplest calculation

Fill with number

if it does't work try another PDF viewer

a:

1.2

b:

c:

$\sum =$

```
\documentclass{article}
\usepackage{hyperref}

\begin{document}
\newcommand{\sss}[1]{this.getField("#1").value}
\begin{Form}
\noindent%
Fill with number\\

\TextField[name=a]{a:} \\

\TextField[name=b]{b:} \\

\TextField[name=c]{c:} \\
\noindent%
\$ \sum = \$ \TextField[name=AvgStat, calculate={

event.value = (
\sss{a} +
\sss{b} +
\sss{c}) ;
}, readonly, value=0]{}\\
\end{Form}
\end{document}
```

1.3 Equation in the form of steps

$$\frac{n_0}{n_1} = q_1 + \frac{1}{q_2 + \frac{1}{q_3 + \frac{1}{q_4 + \dots + \frac{1}{q_{k-1} + \frac{1}{q_k}}}}}$$

```
\documentclass{article}
\usepackage{amsmath}
\def\mywd{35pt}

\begin{document}
\[
\frac{n_0}{n_1} = q_1 + \dfrac{\makebox[\mywd][l]{\$1$}}{\makebox[\mywd][l]{\$q_2 + \dfrac{\makebox[\mywd][l]{\$1$}}{\makebox[\mywd][l]{\$q_3 + \dfrac{\makebox[\mywd][l]{\$1$}}{\makebox[\mywd][l]{\$q_4 + \dots + \dfrac{\raisebox{-6pt}{\$ddots\$}}{\raisebox{-12pt}{+$\dfrac{\makebox[\mywd][l]{\$1$}}{\kern30pt\$}}}}}}}}}
\{q_{k-1} + \dfrac{1}{q_k}\}}
\]
\end{document}
```

1.4 One number for multiline equation

$$\begin{aligned} x_{ij} &= d_{ijk} E_k, \\ x_{ij} &= \varsigma_{ijk} H_k, \\ x_{ij} &= s_{ijkl} X_{kl}, \\ x_{ij} &= \xi_{ij} \delta p, \\ x_{ij} &= \alpha_{ij} \delta T \end{aligned} \quad (1)$$

```
\documentclass{article}
\usepackage{amsmath}

\begin{document}
\begin{equation}
\begin{aligned}
x_{ij} &= d_{ijk} E_k, \\
x_{ij} &= \varsigma_{ijk} H_k, \\
x_{ij} &= s_{ijkl} X_{kl}, \\
x_{ij} &= \xi_{ij} \delta p, \\
x_{ij} &= \alpha_{ij} \delta T
\end{aligned}
\end{equation}
\end{document}
```

1.5 Matrix in standalone documentclass

$$\begin{matrix} 1 & 5 \\ \begin{matrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{matrix} \end{matrix}$$

```
\documentclass[preview,border={-5cm 0cm -5cm -0.1cm}]{standalone}
\usepackage{amsmath}

\begin{document}
\begin{equation*}
\begin{matrix}
a_{11} & a_{12} & a_{13} \\
a_{21} & a_{22} & a_{23} \\
a_{31} & a_{32} & a_{33}
\end{matrix}
\end{equation*}
\end{document}
```

1.6 Multiple lines, one centered label

$$\begin{matrix} 1 & 6 \\ A = \frac{\pi r^2}{2} \\ = \frac{1}{2}\pi r^2 \end{matrix} \quad (2)$$

```
\begin{equation} \label{eq1}
\begin{aligned}
A &= \frac{\pi r^2}{2} \\
&= \frac{1}{2}\pi r^2
\end{aligned}
\end{equation}
```

1.7 Array as a fraction

$$\begin{matrix} 1 & 7 \\ I - IV - V^{6-4 \atop 4-3 \atop 6-4} - I - cadence \\ I - IV - V^{6-4 \atop 4-3} - I - cadence \\ I - IV - V^{6-4 \atop 4-3} - I - cadence \end{matrix}$$

```
\documentclass{article}
\usepackage{amsmath}

\begin{document}
\$I-IV-V^{\{\substack{6-4 \\ 4-3 \\ 6-4}\}}-I-cadence\$ \\
\$I-IV-V^{\{\genfrac{}{}{0pt}{}{6-4}{4-3}\}}-I-cadence\$ \\
\$I-IV-V^{\{\begin{array}{c}6-4 \\ 4-3\end{array}\}}-I-\\
cadence\$ \\
\end{document}
```

1.8 Aligning equations inbetween text

TEXT 1

$$K_I : I \rightarrow 2R \\ K_S : R + M \rightarrow RM^*$$

TEXT 2

$$K_I : I \rightarrow 2R \\ K_S : R + M \rightarrow RM^*$$

```
\documentclass{article}
\usepackage{mathtools}

\begin{document}
\begin{align*}
&\text{\texttt{\intertext{TEXT 1}}}
&K_I : I \rightarrow 2R \\
&K_S : R + M \rightarrow RM^* \\
&\text{\texttt{\intertext{TEXT 2}}}
&K_I : I \rightarrow 2R \\
&K_S : R + M \rightarrow RM^*
\end{align*}
\end{document}
```

1.9 Equation: boxed split inside align

$$A = B + C + D \\ A = \boxed{B \text{ is long} \\ + C \text{ is long too} \\ + D \text{ is long too}}$$

(1)

```
\begin{document}
\begin{align}
\begin{split}
A &= \{} & B + C + D \\
\end{split} \nonumber \\
\mathrlap{\boxed{\phantom{\begin{gathered}A = \{} + C \text{ is long}\\ _long\_too\\ A \end{gathered}}}} \\
\hspace{\dimexpr\fboxsep+\fboxrule-0.4pt} \\
\begin{split}
A &= \{} & \phantom{\{} + C \text{ is long\_too} \\
&+ D \text{ is long\_too} \\
\end{split}
\end{align}
\end{document}
```

1.10 Multiline text above arrow or relation symbol

$$\frac{x+1}{x} \xrightarrow{\text{Euclidean division}} 1 + \frac{1}{x}$$

```
\documentclass[a4paper, 12pt]{article}
\usepackage{mathtools}
\newcommand{\twoline}[2]{\overset{\textup{\scriptsize\#1}}{\textup{\scriptsize\#2}}}

\begin{document}
\begin{equation*}
\dfrac{x+1}{x} \xrightarrow{\text{\texttt{\twoline{Euclidean}{division}}}} 1 + \dfrac{1}{x}
\end{equation*}
\end{document}
```

1.11 Calculating scheme for a particular solution

$$\begin{array}{c|l}
 \begin{matrix} 6 & \times \\ -5 & \times \\ 1 & \times \end{matrix} & y^* = Ate^{2t} + Be^{-2t} \\
 \hline
 e^{2t} & (y^*)' = A(1+2t)e^{2t} - 2Be^{-2t} \\
 e^{-2t} & (y^*)'' = A(4+4t)e^{2t} + 4Be^{-2t} \\
 \hline
 & 1 = 4A - 5A = -A \\
 & 1 = 4B + 10B + 6B = 20B
 \end{array}$$

```

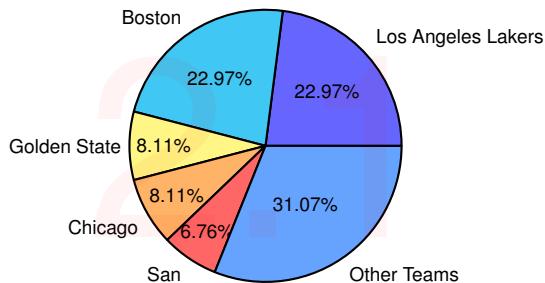
\documentclass{article}
\usepackage{amsmath}
\usepackage{xcolor}
\usepackage{tabulararray}

\begin{document}
\[
\begin{tblr}{colspec={rrrcl},
vline{3} = {magenta},
hline{4} = {magenta},
column{1} = {font=\color{magenta}, rightsep=0pt},
column{2} = {font=\color{magenta}, leftsep=0pt,
rightsep=4pt},
column{3} = {leftsep=4pt, rightsep=0pt},
column{4} = {colsep=2pt},
column{5} = {leftsep=0pt},
row{3} = {belowsep=4pt},
row{4} = {abovesep=4pt}
}
6 & \times & y^* & = & Ate^{2t}+Be^{-2t} \\
-5 & \times & (y^*)' & = & A(1+2t)e^{2t}-2Be^{-2t} \\
1 & \times & (y^*)'' & = & A(4+4t)e^{2t}+4Be^{-2t} \\
& & 1 & = & 4A-5A=-A \\
& & 1 & = & 4B+10B+6B=20B
\end{tblr}
\]
\end{document}

```

2 Plots, tikz, pie charts ...

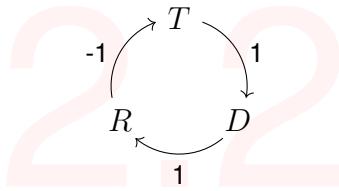
2.1 Simple pie chart



```
\documentclass[border=0.2cm]{standalone}
\usepackage{pgf-pie}

\begin{document}
\begin{tikzpicture}
\pie{22.97/Los Angeles Lakers,
     22.97/Boston Celtics,
     8.11/Golden State Warriors,
     8.11/Chicago Bulls,
     6.76/San Antonio Spurs,
     31.07/Other Teams}
\end{tikzpicture}
\end{document}
```

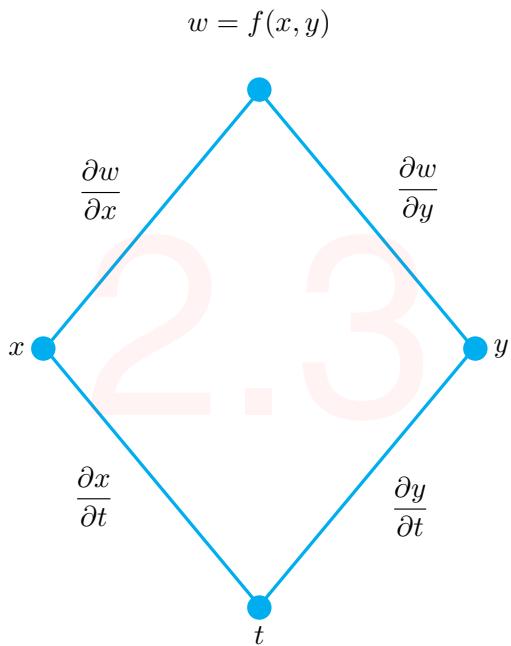
2.2 Circled arrows with text



```
\documentclass{article}
\usepackage{tikz}

\begin{document}
\begin{tikzpicture}[->,scale=.7]
\node (i) at (90:1cm) {$T$};
\node (j) at (-30:1cm) {$D$};
\node (k) at (210:1cm) {$R$};
\draw (70:1cm) arc (70:-10:1cm) node[midway, right] {\tiny \texttt{\{|\footnotesize 1\}}};
\draw (-50:1cm) arc (-50:-130:1cm) node[midway, below] {\tiny \texttt{\{|\footnotesize 1\}}};
\draw (190:1cm) arc (190:110:1cm) node[midway, left] {\tiny \texttt{\{|\footnotesize -1\}}};
\end{tikzpicture}
\end{document}
```

2.3 Diamond with text



```

\documentclass[a4paper,14pt]{extreport}
\usepackage[left=1.5cm,right=1.5cm,top=1.5cm,bottom=2cm,bindingoffset=0cm]{geometry}
\usepackage{amsmath}
\usepackage{tikz}
\usetikzlibrary{shapes.geometric}

\begin{document}
\begin{tikzpicture}
\node[diamond,font=\small, line width=0.4mm,scale=0.7, draw = cyan, minimum width = 7.5cm, %text = red, minimum height = 9cm] (d) at (0,0) {};
\node[above=0.5cm] (a) at (d.90) {$w = f(x,y)$};
\node[above=0.5cm,right=0.1cm] (b) at (d.45) {$\frac{\partial w}{\partial y}$};
\node[above=0.5cm,left=0.1cm] (c) at (d.135) {$\frac{\partial w}{\partial x}$};
\node[left=0.1cm] (dd) at (d.180) {$x$};
\node[right=0.1cm] (e) at (d.0) {$y$};
\node[below=0.1cm] (f) at (d.270) {$t$};
\node[below=0.9cm,right=-0.3cm] (g) at (d.-30) {$\frac{\partial y}{\partial t}$};
\node[below=0.5cm,left=0.1cm] (h) at (d.220) {$\frac{\partial x}{\partial t}$};
\end{tikzpicture}
\end{document}

```

2.4 Levels of skills

2.5 Round levels of skills

2.6 Huge margin line



Word



LaTeX



C++



Python




Skill #1
info



Skill #2
info



Skill #3
info

```
\documentclass{report}
\usepackage[T1]{fontenc}
\usepackage{tikz}
\usepackage{xcolor}

\definecolor{white}{RGB}{255,255,255}
\definecolor{gray}{HTML}{4D4D4D}
\definecolor{maingray}{HTML}{B9B9B9}

\newcommand\skills[1]{
\begin{tikzpicture}
\foreach [count=\i] \x/\y in {#1} {
\draw[fill=maingray,maingray] (0,\i) rectangle (6,\i+0.4);
\draw[fill=white,gray](0,\i) rectangle (\y,\i+0.4);
\node[above right] at (0,\i+0.4) {\x};
}
\end{tikzpicture}
}

\begin{document}
\skills{{b/2}}
\skills{{a/1}}
\end{document}
```

```
\documentclass[svgnames]{article}
\usepackage{tikz}
\usetikzlibrary{calc}
\usepackage{siunitx}% only to force percentages to be integers
\usepackage{enumitem}

\let\realItem\item% save for later use
\newcommand\percentageItem[1][10]{%
\realItem[\smash{\tikz[baseline]{%
\node[minimum width=4em] at (0,0) {\num[round-mode=places,round-precision=0]{#1}\%};%
\draw[thick, line width=1.5mm,Blue] (90:5mm) arc [radius=5mm, start angle=90, delta angle=-#1*3.6];
\draw[thick, line width=1.5mm,LightSteelBlue] (90-#1*3.6:5mm) arc [radius=5mm, start angle=90-#1*3.6, end angle=-270];
}}]\%}

\newlist{achievements}{itemize}{1}
\setlist[achievements]{%
before=\let\item\percentageItem,%make \item = \percentageItem
leftmargin=*,%
label={},%
itemsep=3mm,%
}

\begin{document}

\begin{achievements}
\item[57]\textbf{Skill \#1}\textbackslash\textbf{info}
\item[16]\textbf{Skill \#2}\textbackslash\textbf{info}
\item[77]\textbf{Skill \#3}\textbackslash\textbf{info}
\end{achievements}

\end{document}
```

2.7 Aligning anything to a corner



2.6

Text

Text

Text

1

```
\documentclass{article}
\usepackage [margin=3cm]{geometry}
\usepackage{tikz}

\begin{document}
\tikz[overlay, remember picture] \draw[line width=2.5mm] ([xshift=1cm,
yshift=-1cm]current page.north west) rectangle ([xshift=-1cm,
yshift=1cm]current page.south east);
Text
\vfill
Text
\vfill
Text
\end{document}
```

2.7

Find me

```
\documentclass[14pt]{extreport}
\usepackage{tikz}
\usepackage{qrcode}

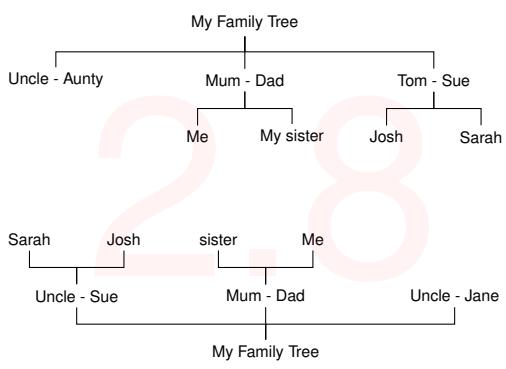
\begin{document}
\begin{tikzpicture}[remember picture,overlay]
\node[anchor=north west,yshift=0pt,xshift=0pt]%
at (current page.north west)
{\qrcode[height=0.5cm]{https://github.com/AnMnv/eBook}%; --- put here anything
};
\end{tikzpicture}
\end{document}

OR the rainbow variant (see example 9.7)

\begin{tikzpicture}[remember picture,overlay]
\node at ($(current page.north west)+(.70cm,-.75cm)$)
{\fadingtext[scale=0.5]{path picture shading=rainbow}
{\qrcode[height=3cm]{https://github.com/AnMnv/eBook}}};
\end{tikzpicture}
```

2.8

Family tree



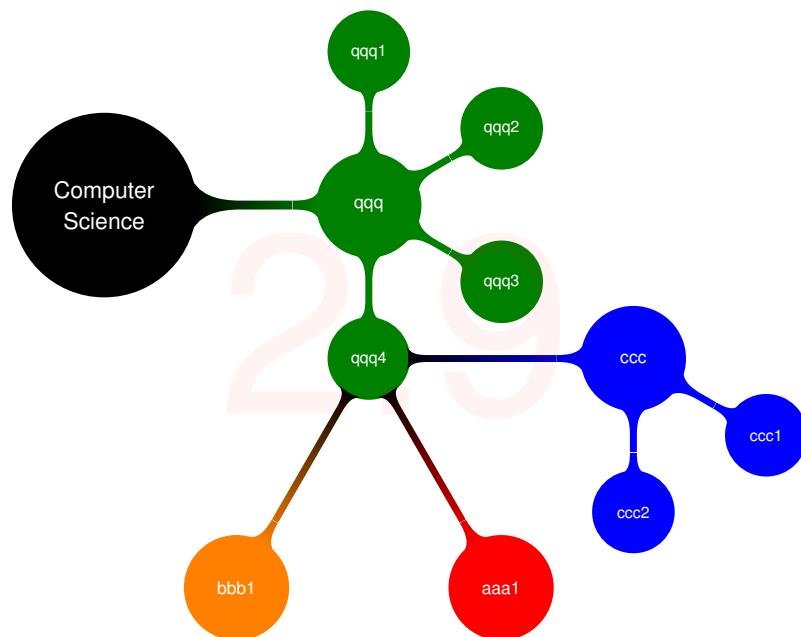
```

\documentclass{article}
\usepackage{tikz}
\usetikzlibrary{trees}

\begin{document}
\begin{tikzpicture}[level 1/.style={sibling distance=5cm}, level 2/.style={sibling distance=2.5cm}]
    \node {My Family Tree} [edge from parent fork down]
        child { node {Uncle John - Aunty Jane}}
        child { node {Mum - Dad}
            child {node{Me}}
            child {node{My sister}}
        }
        child { node {Uncle Tom - Aunty Sue}
            child {node{Cousin Josh}}
            child {node{Cousin Sarah}}
        };
\end{tikzpicture}
\end{document}

```

2.9 Mind map



13

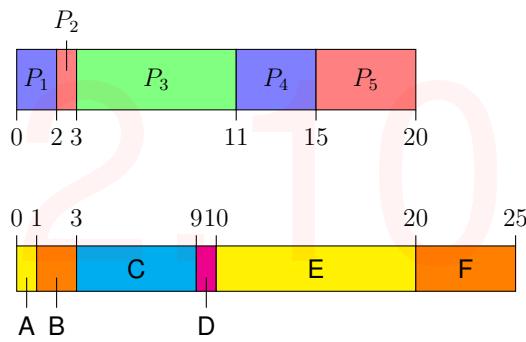
```
\documentclass{article}
\usepackage[utf8]{inputenc}
\usepackage{tikz}
\usetikzlibrary{mindmap}
\usetikzlibrary[mindmap]

\begin{document}

\begin{tikzpicture}
\node[concept] {Computer Science}
[clockwise from=0]
% note that `sibling angle` can only be defined in
% `level 1 concept/.append style={}`
child[concept color=green!50!black] {
    node[concept] {practical}
    [clockwise from=90]
    child[concept] {algorithms}
    child[concept] {data structures}
    child[concept] {pro\-gramming languages}
    child[concept] {software engineer\-ing}
}
% note that the `concept color` is passed to the `child`(!)
child[concept color=blue] {
    node[concept] {applied}
    [clockwise from=-30]
    child[concept] {databases}
    child[concept] {WWW}
}
child[concept color=red] { node[concept] {technical} }
child[concept color=orange] { node[concept] {theoretical} };
\end{tikzpicture}

\end{document}
```

2.10 Gantt chart



```

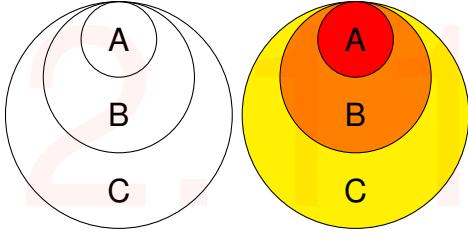
\documentclass[border=10pt]{standalone}
\usepackage{tikz}

\newif\ifsimplegantttickpositionbelow
\tikzset{
pics/simple gantt/.style={
code={
\ifsimplegantttickpositionbelow
\path[/tikz/simple gantt/tick] (0,0) --
++(0,{1*\pgfkeysvalueof{/tikz/simple gantt/tick length}})
node[/tikz/simple gantt/tick label] {\pgfmathprintnumber{0}};
\else
\path[/tikz/simple gantt/tick] (0,\pgfkeysvalueof{/tikz/simple gantt/height}) --
++(0,{\pgfkeysvalueof{/tikz/simple gantt/tick length}})
node[/tikz/simple gantt/tick label] {\pgfmathprintnumber{0}};
\fi
\foreach \n/\x [count=\i, remember=\x as \lastx (initially 0)] in {\#1} {
\ifsimplegantttickpositionbelow
\path[/tikz/simple gantt/tick] ({\x*\pgfkeysvalueof{/tikz/simple gantt/width unit}},0) --
++(0,{1*\pgfkeysvalueof{/tikz/simple gantt/tick length}})
node[/tikz/simple gantt/tick label] {\pgfmathprintnumber{\x}};
\else
\path[/tikz/simple gantt/tick] ({\x*\pgfkeysvalueof{/tikz/simple gantt/width unit}},\pgfkeysvalueof{/tikz/simple gantt/height}) --
++(0,{\pgfkeysvalueof{/tikz/simple gantt/tick length}})
node[/tikz/simple gantt/tick label] {\pgfmathprintnumber{\x}};
\fi
\pgfmathparse{int(mod(\i - 1, \pgfkeysvalueof{/tikz/simple gantt/color cycle length}) + 1)}
\global\pgfkeyslet{/tikz/simple gantt/color cycle step}{\pgfmathresult}
\path[
/tikz/simple gantt/box,
fill={simple gantt color \pgfkeysvalueof{/tikz/simple gantt/color cycle step}},
]
({\lastx*\pgfkeysvalueof{/tikz/simple gantt/width unit}},0) rectangle
({\x*\pgfkeysvalueof{/tikz/simple gantt/width unit}},\pgfkeysvalueof{/tikz/simple gantt/height})
\pgfextra{\pgfmathparse{\x - \lastx}}
\ifdim\pgfmathresult pt < \pgfkeysvalueof{/tikz/simple gantt/label as pin if value below} pt
    relax
    node[/tikz/simple gantt/label, pin={[/tikz/simple gantt/label pin]\pgfkeysvalueof{/tikz/simple gantt/label pin angle}}:{\n}] {}
\else
    node[/tikz/simple gantt/label] {\n}
\fi ;}),
simple gantt/color cycle length/.initial={0},
simple gantt/color cycle step/.initial={1},
simple gantt/color cycle/.code={
\foreach \c [count=\i] in {\#1} {
\xglobal\colorlet{simple gantt color \i}{\c}
\global\pgfkeyslet{/tikz/simple gantt/color cycle length}{\i}},
simple gantt/height/.initial={1cm},
simple gantt/width unit/.initial={1cm},
simple gantt/box/.style={},
simple gantt/label/.style={pos=0.5},
simple gantt/label pin/.style={above, pin edge={black, thin}, pin distance=0.5cm},
simple gantt/label pin angle/.initial={90},
simple gantt/label as pin if value below/.initial={1.5},
simple gantt/tick/.style={draw},
simple gantt/tick label/.style={below},
simple gantt/tick position/.is choice,
simple gantt/tick position/above/.code={\simplegantttickpositionbelowfalse},
simple gantt/tick position/below/.code={\simplegantttickpositionbelowtrue},
simple gantt/tick position={below},
simple gantt/tick length/.initial={5pt},
simple gantt/color cycle={blue!50, red!50, green!50},}
\begin{document}
\begin{tikzpicture}
\tikzset{simple gantt/.cd, width unit=0.33cm,box/.style={draw}}
\pic at (0,0) {simple gantt={$P_1$/2, $P_2$/3, $P_3$/11, $P_4$/15, $P_5$/20}};

\tikzset{simple gantt/.cd, height=0.75cm, color cycle={yellow, orange, cyan, magenta},
label pin angle={270}, label pin/.append style={below}, tick position={above},
tick label/.append style={above},label as pin if value below={4}}
\pic at (0,-3) {simple gantt={A/1, B/3, C/9, D/10, E/20, F/25}};
\end{tikzpicture}
\end{document}

```

2.11 Drawing a stacked venn diagram



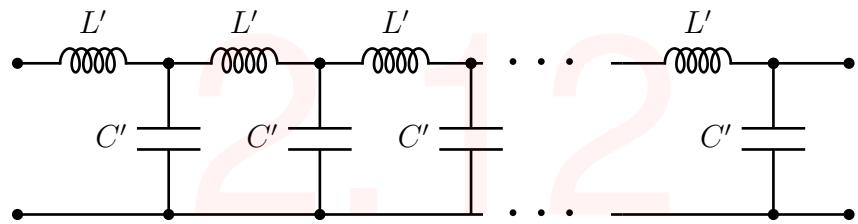
```

\documentclass[border=10pt]{standalone}
\usepackage{tikz}

\begin{document}
\begin{tikzpicture}[scale=0.5]
\foreach \x [count=\y] in {A,B,C} {
    \draw (0,-\y) circle[radius=\y];
    \node at (0,-2*\y+1) {\x};
}
\end{tikzpicture}
\begin{tikzpicture}[scale=0.5]
\foreach \x/\z [count=\y] in {C/yellow,B/orange,A/red} {
    \draw[fill=\z] (0,\y-4) circle[radius={4-\y}];
    \node at (0,-2*(4-\y)+1) {\x};
}
\end{tikzpicture}
\end{document}

```

2.12 Ellipsis in Circuitikz



```
\documentclass{article}
\usepackage[circuitikz]
\ctikzset{bipoles/thickness = 1}
\begin{document}
\begin{circuitikz}[line width=1pt]
\draw (0,2) to[L,l=$L'$,*-*] (2,2)
(2,0) to[C,l=$C'$,-*] (2,2)
(2,0) to[short,-*] (0,0);
;
\begin{scope}[xshift=2cm]
\draw (0,2) to[L,l=$L'$,*-*] (2,2)
(2,0) to[C,l=$C'$,-*] (2,2)
(2,0) to[short,-*] (0,0);
;
\end{scope}
\begin{scope}[xshift=4cm]
\draw (0,2) to[L,l=$L'$,*-*] (2,2)
(2,0) to[C,l=$C'$,-*] (2,2)
(2,0) to[short,-*] (0,0);
;
\end{scope}
\begin{scope}[xshift=6cm]
\draw (0,2) -- (2,2)node[midway,scale=2,fill=white]{\cdots};
\draw (0,0) -- (2,0)node[midway,scale=2,fill=white]{\cdots};
\end{scope}
\draw (8,2) to[L,l=$L'$,-*] (10,2) to[short,-*] (11,2)
(10,0) to[C,l=$C'$,-*] (10,2)
(11,0) to[short,-*](10,0) to[short,-*] (8,0);
;
\end{circuitikz}
\end{document}
```