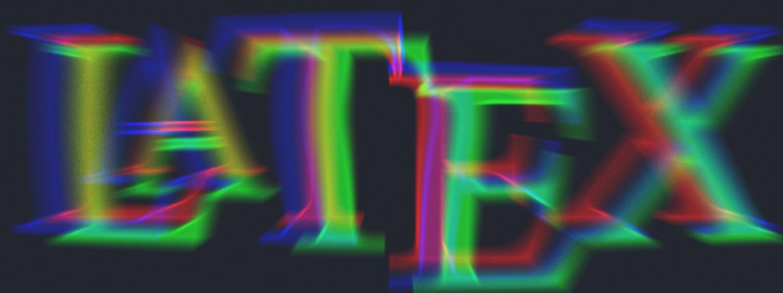


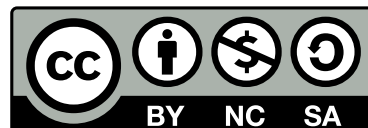
# Latex in Examples



Thanks to me

Examples in this book is updated  
every week.

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<pre>\begin{equation*}\label{eq1} \resizebox{.4\textwidth}{!}{ \$\dot{\rho}=\frac{x^3}{45a ,\rightarrow ^9-23b}\$} \end{equation*}</pre>	<pre>\begin{equation*}\label{eq1} \resizebox{.4\textwidth}{!}{ \$\dot{\rho}=\frac{x^3}{45a ,\rightarrow ^9-23b}\$} \end{equation*}</pre>	<pre>\begin{equation*}\label{eq1} \resizebox{.4\textwidth}{!}{ \$\dot{\rho}=\frac{x^3}{45a ^9-23b}\$} \end{equation*}</pre>
--	--	---

CORRECT paste code from examples

# Chapter 1

## Math Tips

### 1.1 Auto-resizing equation

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

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

### 1.2 Form for simplest calculation

Fill with number  
if it doesn't work try another PDF viewer

a:

b:

c:

$\Sigma =$

```
\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}
\[
\frac{n_0}{n_1} = q_1 + \dfrac{\makebox[\mywd][l]{
\hspace{1pt}
}}{
\makebox[\mywd][l]{q_2 + \dfrac{\makebox[\mywd][l]{
\hspace{1pt}
}}{
\makebox[\mywd][l]{q_3 + \dfrac{\makebox[\mywd][l]{
\hspace{1pt}
}}{
\makebox[\mywd][l]{q_4 +
\raisebox{-6pt}{\hspace{\ddots}}
\raisebox{-12pt}{\hspace{\dfrac{\makebox[\mywd][l]{\hspace{1pt}}{
\hspace{30pt}}
}}{
q_{k-1} + \dfrac{1}{
q_k
}}
}}
}}
}}
}
\]
\end{document}

```

### 1.4 One number for multiline equation

$$\begin{aligned} x_{ij} &= d_{ijk} E_k, \\ x_{ij} &= \varsigma_{ijk} H_k, \\ x_{ij} &= s_{ijkl} X_{kl}, \\ x_{ij} &= \xi_{ij} \delta p, \\ x_{ij} &= \alpha_{ij} \delta T \end{aligned} \quad (1.1)$$

```

\documentclass{article}
\usepackage{amsmath}
\begin{document}
\begin{equation}
\begin{aligned}
x_{ij} &= d_{ijk}E_k, \\
x_{ij} &= \text{varsigma}_{ijk}H_k, \\
x_{ij} &= s_{ijkl}X_{kl}, \\
x_{ij} &= \text{xi}_{ij}\delta p, \\
x_{ij} &= \alpha_{ij}\delta T
\end{aligned}
\end{equation}
\end{document}

```

## 1.5 Matrix in standalone documentclass

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

```
\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{matrix}
\end{equation*}
\end{document}
```

## 1.6 Multiple lines, one centered label

$$\begin{aligned} A &= \frac{\pi r^2}{2} \\ &= \frac{1}{2} \pi r^2 \end{aligned} \quad (1.2)$$

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



# Chapter 2

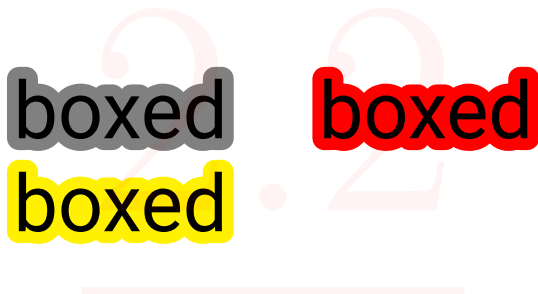
## Text, Symbols

### 2.1 New section symbol



```
\usepackage[object=vectorian]{pgfornament}  
\usepackage{lipsum,tikz}  
\newcommand{\sectionlinetwo}[2]{%  
  \nointerlineskip \vspace{.5\baselineskip} \hspace{\fill}  
  {\color{#1}\resizebox{0.5\linewidth}{2ex}  
  {{{\begin{tikzpicture}  
    \node (C) at (0,0) {}; \node (D) at (9,0) {};  
    \path (C) to [ornament=#2] (D);  
    \end{tikzpicture}}}}}%  
  \hspace{\fill} \par \nointerlineskip  
  \vspace{.5\baselineskip}  
  %usage---> \sectionlinetwo{orange}{88}
```

### 2.2 Wireframe rendering



```
\documentclass{article}  
\usepackage{xcolor}  
\usepackage{roboto}  
\usepackage[outline]{contour}  
\begin{document}  
\roboto\huge\contourlength{.15em}  
\contour{gray}{boxed}  
\end{document}
```

### 2.3 Justified text

1. First item in a list
2. Second item in a list
3. Third item in a list
4. Fourth item in a list
5. Fifth item in a list
6. Sixth item in a list
7. Seventh item in a list
8. Eighth item in a list
9. Ninth item in a list
10. Tenth item in a list

```
\documentclass{article}
\usepackage{blindtext}
\newcommand*\justify{%
  \fontdimen2\font=0.4em% interword space
  \fontdimen3\font=0.2em% interword stretch
  \fontdimen4\font=0.1em% interword shrink
  \fontdimen7\font=0.1em% extra space
  \hyphenchar\font='- % allowing hyphenation
}

\begin{document}
\texttt{\justify\blindenumerate[10]}
\end{document}
```

## 2.4 Text under an underline

This is short text  


---

(some text)

```
\documentclass[12pt]{article}
\usepackage{amsmath,soul}
\usepackage{soulpos}
\ulposdef{\ulnumaux}{%
$\underset{\saveulnum}{\rule[-.7ex]{\ulwidth}{.4pt}}$}
\newcommand{\ulnum}[2]{%
\def\saveulnum{#1}%
\ulnumaux{#2}}

\begin{document}
\ulnum{\text{(some text)}}{This is short text}
\end{document}
```

# Chapter 3

## Code, listings, minted ...

### 3.1 Code listing using *`minted`* in *`beamer`*



Python Code Example

```
1 import glob
2
```

```
\documentclass{beamer}
\usepackage{amsmath}
\usepackage{tcolorbox}
\tcbuselibrary{minted,skins,breakable}
\newtcblisting{pythoncode}[2][]{
  listing engine=minted, breakable, colback=bg,
  colframe=black!70, listing only,
  minted style=colorful, minted language=python,
  minted options={numbersep=3mm,texcl=true,#1},
  left=5mm,enhanced,
  overlay={\begin{tcbclipinterior}\fill[black!25] (frame.south west)
rectangle ([xshift=5mm]frame.north west);\end{tcbclipinterior}},
#2,}
\begin{document}
\begin{frame}[fragile]
  \frametitle{Premature Optimization}
  \begin{pythoncode}[linenos=true,]{title=Python Code
    ↪ Example}
    import glob
  \end{pythoncode}
\end{frame}
\end{document}
```

## 3.2 "Zebra" style listing

```
/**
 * Prints Hello World.
 **/
#include <stdio.h>

int main(void) {
    printf("Hello World!");
    return 0;
}
```

```
\documentclass{article}
\usepackage[T1]{fontenc}
\usepackage{beramono}
\usepackage{listings}
\usepackage{xcolor}
\newcommand\realnumberstyle[1]{%
\makeatletter
\newcommand{\zebra}[3]{%
{\realnumberstyle{#3}}%
\begin{group}
\lst@basicstyle
\ifodd\value{lstnumber}%
\color{#1}%
\else
\color{#2}%
\fi
\rlap{\hspace*{\lst@numbersep}%
\color@block{\linewidth}{\ht\strutbox}{\dp\strutbox}%
}%
\end{group}
\makeatother
\begin{document}
\begin{lstlisting}[language=C,basicstyle=\ttfamily,
numberstyle=\zebra{green!35}{yellow!35},numbers=left]
/**
 * Prints Hello World.
 **/
#include <stdio.h>
int main(void) {
    printf("Hello World!");
    return 0;
}
\end{lstlisting}
\end{document}
```

## 3.3 Listing with russian language

```
print("English comment"); // English comment
print("Russian comment"); // Русский комментарий
```

```
\documentclass{article}
\usepackage[T2A]{fontenc}
\usepackage{utf8}{inputenc}
\usepackage[russian]{babel}
\usepackage{listings}
\usepackage{xcolor}

\begin{document}
\lstset{ keepspaces=true,
backgroundcolor=\color{blue},
showstringspaces=false,
language=C,
extendedchars=true,
framexrightmargin=0pt,
framexleftmargin=0pt,
framextopmargin=15pt,
framebottommargin=15pt,
frame=tb, framerule=0pt,
basicstyle=\color{yellow}\ttfamily\small}

\begin{lstlisting}% <<<<<<<< add "/"
print("English comment"); // English comment
print("Russian comment"); // %here can be russian words
\end{lstlisting}% <<<<<<<< add "/"

\end{document}
```

## 3.4 Listing with `minted`

```
1 int main(int ac, char *av[])
2 {
3     printf("Hello, World");
4     return 0;
5 }
```

```
\documentclass{article}
\usepackage[many]{tcolorbox}
\tcbuselibrary{minted}
\newtcblisting{mylisting}{
  colframe=cyan,
  colback=cyan!10,
  listing only,
  listing engine=minted,
  minted language=cpp,
  minted options={fontsize=\small,linenos,numbersep=3mm},
}

\begin{document}
\begin{mylisting}
some code
\end{mylisting}
\end{document}
```

# Chapter 4

## Tables, boxes and so on

### 4.1 Nice tcolorbox

1	22
333	
Source	

```
\PassOptionsToPackage{svgnames}{xcolor}
\documentclass[twocolumn,a4paper]{article}
\usepackage{tcolorbox}
\tcbuselibrary{skins,breakable}
\usetikzlibrary{shadings,shadows}%preamble
\begin{tcolorbox}[colback=white!100,colframe=red!75!black,width=7cm,
  ↳ righttitle=0.5cm, subtitle style={boxrule=0.4pt,colback=yellow!50!red
  ↳ !25!white},title= \bf{1}\hfill \bf{22}]
  \begin{center}\bf{333}\end{center}
  \tcblower
  \href{https://tools.ietf.org/doc/texlive-doc/latex/tcolorbox/tcolorbox.
    ↳ pdf}{URL}
\end{tcolorbox}
```

### 4.2 Color box with yellow border

Remarque
Some text inside

```
\documentclass[border=2mm]{standalone}
\usepackage[most]{tcolorbox}
\usepackage{lipsum}

\newtcolorbox{mycolorbox}[1]{
  enhanced, breakable,
  title=#1, colback=white,
  colbacktitle=green!20!white,
  coltitle=black,
  fonttitle=\bfseries,
  boxrule=.5pt, arc=0pt,
  outer arc=0pt,
  colframe=yellow!80!orange,
  borderline west={2pt}{0pt}{red} }

\begin{document}
\begin{mycolorbox}{Remarque}
\lipsum[1]
\end{mycolorbox}
\end{document}
```

## 4.3 A drop capital in a tcolorbox

SOME text. Lorem ipsum dolor sit amet, consectetur adipiscing elit.

```
\documentclass{article}
\usepackage{lettrine}
\usepackage{tcolorbox}
\usepackage{lipsum}

\begin{document}
\begin{tcolorbox}
\lettrine{S}{ome} text. \lipsum[1]
\end{tcolorbox}
\end{document}
```

## 4.4 Table with the desired length.

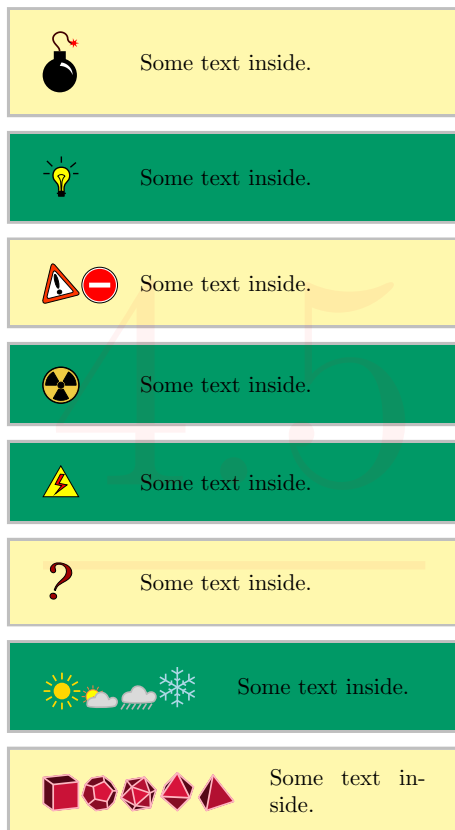
Table 1: Caption

Variant	res	Veriaty of waters $f_0$ , res	C, res	L, res
5	1	2	1.26	5

a command was also created to make a new cell view in the table

```
\usepackage{graphicx}
\usepackage{tabularx}
\newcolumnntype{Y}{>{\centering\arraybackslash}X}
\begin{document}
\begin{table}[h!]
\begin{center}
\caption{\textbf{Caption}}
\begin{tabularx}{14cm}{|Y|Y|c|Y|Y|}
\hline
Variant & res & Veriaty of waters  $f_0$ , res & C, res & L, res \\
\hline
5 & 1 & 2 & 1.26 & 5 \\
\hline
\end{tabularx}
\end{center}
\end{table}
```

## 4.5 bclogo – Creating colourful boxes with logos



```
\documentclass{article}
\usepackage{geometry}
\geometry{
paperwidth=8cm,
paperheight=14cm,
margin=0.5cm
}
\usepackage{xcolor}
\usepackage[most]{tcolorbox}
\usepackage{tikz}{bclogo}

\newtcolorbox{framedd}[1][{}]{
colframe=lightgray,
colback=yellow!40!white,
enhanced jigsaw,
sharp corners,
lower separated=false,
lefthand width=1cm,
sidebyside gap=0.5cm,
sidebyside,#1}

\begin{document}
\begin{framedd}
\bcbombe \tcblower Some text inside.
\end{framedd}

\begin{framedd}[colback=blue!40!green]
\bcclampe \tcblower Some text inside.
\end{framedd}

\begin{framedd}
\bcattention \bcinterdit \tcblower
Some text inside.
\end{framedd}

\begin{framedd}[colback=blue!40!green]
\bcnucleaire \tcblower
Some text inside.
\end{framedd}

\begin{framedd}[colback=blue!40!green]
\bcdanger \tcblower
Some text inside.
\end{framedd}

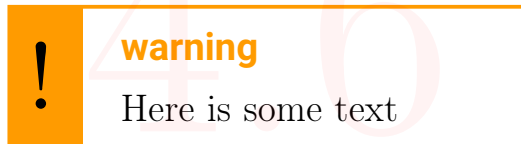
\begin{framedd}
\bcquestion \tcblower
Some text inside.
\end{framedd}

\begin{framedd}[colback=blue!40!green, lefthand width=2.5cm]
\bcsoleil \bceclaircie \bcpluie \bcneige \tcblower
Some text inside.
\end{framedd}

\begin{framedd}[lefthand width=3cm]
\bccube \bcdodecaedre \bcicosaedre \bcocetaedre \bctetraedre \tcblower
Some text inside.
\end{framedd}
\end{document}
```

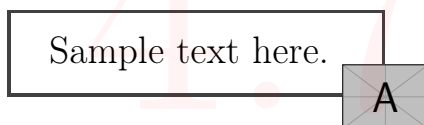


## 4.6 Warning banner



```
\usepackage[utf8]{inputenc}
\usepackage[T1]{fontenc}
\usepackage[most]{tcolorbox}
\definecolor{orang}{RGB}{255,155,0}
\newtcolorbox[auto counter,number within=section]{caja}[1][]{
enhanced jigsaw,colback=white,colframe=orang,coltitle=orang,
fonttitle=\bfseries\sffamily,
sharp corners,
detach title,
lefrule=10mm,
% What you need %%%%%%%%%%%
underlay unbroken and first={\node[below,text=black,anchor=east]
at ([xshift=-5.5pt]interior.base west) {\Huge \textbf{!}};},
%%%%%%%%%%
breakable,pad at break=1mm,
#1,
code={\ifdefempty{\tcbtitletext}{\tcbset{before upper={\
    ↳ tcbtitle\par\medskip}}},}
\begin{document}
\begin{caja}[title=warning]
The vertical alignment settings
\end{caja}
\end{document}
```

## 4.7 Photo positioning



```
\documentclass{article}
\usepackage[most]{tcolorbox}
\usepackage{graphicx}
\begin{document}
\begin{tcolorbox}[enhanced,sharp corners,
width={5cm},
colback=white,
overlay={\node at (frame.south east) {\includegraphics[scale=0.1]{
    ↳ example-image-a}};}]
Sample text here.
\end{tcolorbox}
\end{document}
```

## 4.8 Absolutely centered cells (vertically and horison- tally)

all	in	cells
are	centered	vertically
and	horisontally	$\Sigma$

```

\documentclass{article}
\usepackage{float}
\usepackage{array, makecell}
\setcellgapes{5pt}

\begin{document}
\begin{table}[H]
\center
\makegapedcells
\begin{tabular}{|c|c|c|c|}
\hline
1&1&1&1 \\ \hline
1&1&1&1 \\ \hline
1&1&1&1 \\ \hline
\end{tabular}
\end{table}

\end{document}

```

## 4.9 Martix made of table

$$d_{n+1} \begin{vmatrix} a_{1,1} & \dots, a_{1,n} & 0 \\ a_{1,1} & \dots, a_{1,n} & 0 \\ \dots\dots\dots \\ a_{1,1} & \dots, a_{1,n} & 0 \\ a_{1,1} & \dots, a_{1,n} & 0 \\ a_{1,1} & \dots, a_{1,n} & 0 \\ \dots\dots\dots \\ a_{1,1} & \dots, a_{1,n} & 0 \end{vmatrix} = 0$$

```

\documentclass[a4paper,14pt]{extreport}
\begin{document}
\begin{table}[]
\begin{tabular}{|l|l c r|l}
& $a_{1,1}$ & $\dots, a_{1,n}$ & $0$ & \\
& $a_{1,1}$ & $\dots, a_{1,n}$ & $0$ & \\
& \multicolumn{3}{|l|}{\dotfill} & \\
& $a_{1,1}$ & $\dots, a_{1,n}$ & $0$ & \\
& $a_{1,1}$ & $\dots, a_{1,n}$ & $0$ & \\
& $d_{n+1}$ & & $= \pm 2ad_n = 0$ & \\
& $a_{1,1}$ & $\dots, a_{1,n}$ & $0$ & \\
& $a_{1,1}$ & $\dots, a_{1,n}$ & $0$ & \\
& \multicolumn{3}{|l|}{\dotfill} & \\
& $a_{1,1}$ & $\dots, a_{1,n}$ & $0$ & \\
\end{tabular}
\end{table}
\end{document}

```

## 4.10 Centering cells with NiceTabular

1	1	EVERY
1	1	CELL
1	1	CENTERED

```

\documentclass{article}
\usepackage[table]{xcolor}
\usepackage{nicematrix}
\NiceMatrixOptions{cell-space-top-limit=5pt,cell-space-bottom-
    ↪ limit=5pt}

\begin{document}
\begin{table}[htbp]
\centering
\begin{NiceTabular}{|c|c|c|}
\hline
\cellcolor{red}1&\cellcolor{green}1&1 \\ \hline
\cellcolor{orange}1&\cellcolor{red!35}1&1 \\ \hline
\cellcolor{green!35}1&\cellcolor{blue!45}1&1 \\ \hline
\end{NiceTabular}
\end{table}
\end{document}

```

## 4.11 Centered cells in longtable

Enum	Example	Description
1	test	Quisque facilisis auctor sapien. Pellentesque gravida hendrerit lectus. Mauris rutrum sodales sapien. Fusce hendrerit sem vel lorem. Integer pellentesque massa vel augue. Integer elit tortor, feugiat quis, sagittis et, ornare non, lacus. Vestibulum posuere pellentesque eros. Quisque venenatis ipsum dictum nulla. Aliquam quis quam non metus eleifend interdum. Nam eget sapien ac mauris malesuada adipiscing. Etiam eleifend neque sed quam. Nulla facilisi. Proin a ligula. Sed id dui eu nibh egestas tincidunt. Suspendisse arcu.
2a	test	Quisque facilisis auctor sapien. Pellentesque gravida hendrerit lectus. Mauris rutrum sodales sapien. Fusce hendrerit sem vel lorem. Integer pellentesque massa vel augue. Integer elit tortor, feugiat quis, sagittis et, ornare non, lacus. Vestibulum posuere pellentesque eros. Quisque venenatis ipsum dictum nulla. Aliquam quis quam non metus eleifend interdum. Nam eget sapien ac mauris malesuada adipiscing. Etiam eleifend neque sed quam. Nulla facilisi. Proin a ligula. Sed id dui eu nibh egestas tincidunt. Suspendisse arcu.
2b	test	Quisque facilisis auctor sapien. Pellentesque gravida hendrerit lectus. Mauris rutrum sodales sapien. Fusce hendrerit sem vel lorem. Integer pellentesque massa vel augue. Integer elit tortor, feugiat quis, sagittis et, ornare non, lacus. Vestibulum posuere pellentesque eros. Quisque venenatis ipsum dictum nulla. Aliquam quis quam non metus eleifend interdum. Nam eget sapien ac mauris malesuada adipiscing. Etiam eleifend neque sed quam. Nulla facilisi. Proin a ligula. Sed id dui eu nibh egestas tincidunt. Suspendisse arcu.

```

\documentclass{article}
\usepackage[left=1.5cm,right=1.5cm,
top=1.5cm,bottom=2cm,bindingoffset=0cm]{geometry}
\usepackage{float}
\usepackage{array, makecell}
\usepackage{utf8}{inputenc}
\usepackage{lipsum}
\usepackage{booktabs}
\usepackage{multirow}
\usepackage{pdfscape}
\usepackage{longtable, array}

\begin{document}
\begin{landscape}
\begin{longtable}{@{} *{2}{m{.15\paperwidth}} *{1}{m{.40\paperwidth}} @{}}
\endfirsthead
\endhead
\toprule
\textbf{Enum} & \textbf{Example} & \textbf{Description} \\
\midrule
1 & test & \lipsum[50] \\
\midrule
2a & test & \lipsum[50] \\
2b & test & \lipsum[50] \\
\bottomrule
\end{longtable}
\end{landscape}
\end{document}

```

## 4.12 If table is not wide enough

	Item1	Item2	Item3
Group1	0.8	0.1	0.1
Group2	0.1	0.8	0.1
Group3	0.1	0.1	0.8
Group4	0.34	0.33	0.33

```

\documentclass{article}
\usepackage[left=1.5cm,right=1.5cm,
top=1.5cm,bottom=2cm,bindingsoffset=0cm]{geometry}
\usepackage{graphicx}
\usepackage{booktabs}
\usepackage{tabularx}

\begin{document}

\begin{table}[!ht]
\caption{Vertical and lateral stresses of mortar.}
\vspace{0.5cm}
\begin{tabularx}{\textwidth}{X X X X}
& Item1 & Item2 & Item3 \\ \midrule
Group1 & 0.8 & 0.1 & 0.1 \\
Group2 & 0.1 & 0.8 & 0.1 \\
Group3 & 0.1 & 0.1 & 0.8 \\
Group4 & 0.34 & 0.33 & 0.33 \\ \bottomrule
\end{tabularx}
\label{c}
\end{table}

\end{document}

```

## 4.13 Text next to a table

text text text

1	22	333

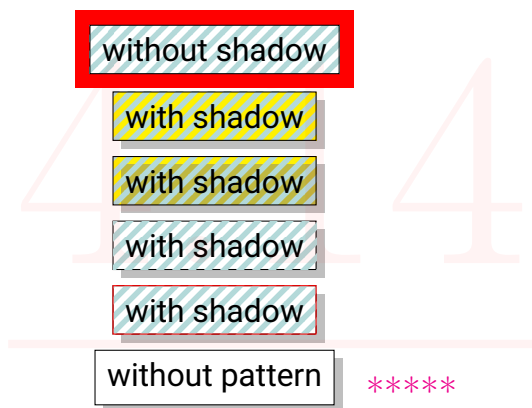
```

\documentclass[a4paper,14pt]{extreport}
\usepackage[left=1.5cm,right=1.5cm,top=1.5cm,bottom=2cm,
↪ bindingsoffset=0cm]{geometry}
\usepackage{lipsum}

\begin{document}
\begin{minipage}[m]{0.58\textwidth}
text text text
\end{minipage}
\hspace{0.2cm}
\begin{minipage}[m]{0.40\textwidth}
\begin{tabular}{|c|c|c|}
\hline
1 & 22 & 333 \\ \hline
& & \\ \hline
& & \\ \hline
& & \\ \hline
\end{tabular}
\end{minipage}
\end{document}

```

## 4.14 Text next to a table



```

\documentclass[tikz,border=5mm]{standalone}
\usetikzlibrary{chains,patterns,shadows,fit,backgrounds}

\makeatletter
\tikzset{% customization of pattern
  % based on <m.wibrow@gm...> - 2013-03-24 07:20:
  hatch distance/.store in=\hatchdistance,
  hatch distance=5pt,
  hatch thickness/.store in=\hatchthickness,
  hatch thickness=5pt
}
\pgfdeclarepatternformonly[\hatchdistance,\hatchthickness]{north east hatch
  ↪ }% name
{
  \pgfpoint{-1pt}{-1pt}}% below left
{
  \pgfpoint{\hatchdistance}{\hatchdistance}}% above right
{
  \pgfpoint{\hatchdistance-1pt}{\hatchdistance-1pt}}%
{
  \pgfsetcolor{\tikz@pattern@color}
  \pgfsetlinewidth{\hatchthickness}
  \pgfpathmoveto{\pgfpoint{0pt}{0pt}}
  \pgfpathlineto{\pgfpoint{\hatchdistance}{\hatchdistance}}
  \pgfusepath{stroke}
}
\makeatother

\begin{document}
\begin{tikzpicture}[
  start chain=going below,
  node distance=2mm,
  Node/.style = {minimum width=#1,
    shape=rectangle,
    draw, fill=white,
    on chain},
  Pattern/.style = {pattern=north east hatch,
    pattern color=teal!30,
    hatch distance=7pt,
    hatch thickness=2pt},
  font=\small\sffamily]
%-----
\node[Node=24mm, Pattern,
  preaction={fill=white}] (a) {without shadow};
\begin{scope}[on background layer]
\node[fit=(a),fill=red] {};
\end{scope}

\node[Node=24mm, drop shadow,
  preaction={fill=yellow}, Pattern] (b) {with shadow};

\node[Node=24mm, preaction={fill=yellow},
  drop shadow, Pattern] (b) {with shadow};

\node[Node=24mm, postaction={Pattern},
  drop shadow] (b) {with shadow};

\node[Node=24mm, postaction={draw=red, Pattern},
  drop shadow] (b) {with shadow};

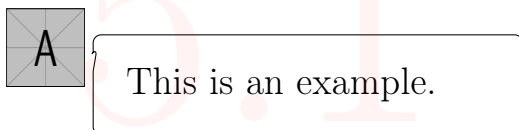
\node[Node=24mm, drop shadow] (c) {without pattern};
%---
\end{tikzpicture}
\end{document}

```

# Chapter 5

## Figures

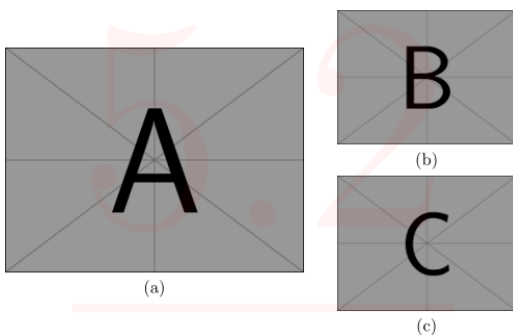
### 5.1 Comment to figure



```
\documentclass{article}
\usepackage{tikz}
\usetikzlibrary{shapes.callouts}

\begin{document}
\begin{tikzpicture}
  \node [anchor=south west] at (0,0) (cartoon) {\includegraphics[width
    ↪=.15\textwidth,height=.15\textwidth]{example-image-a}};
  \node [anchor=north west,rectangle callout,draw=black,
    ↪callout absolute pointer=(cartoon.east),
    ↪rounded corners=3pt,text width=0.7\textwidth, inner sep=2ex] at (.19\
    ↪textwidth,.125\textwidth) {This is an example.};
\end{tikzpicture}
\end{document}
```

### 5.2 Positioning 1 | 2



```
\documentclass{article}
\usepackage{graphicx}
\usepackage{subfig}
\begin{document}
\begin{figure}[htp]
\centering
\begin{tabular}{@{}c@{}}
\subfloat{\includegraphics[width=0.5\linewidth]{example-image-a.png}}\\ (a)
\end{tabular}
\quad % some space
\begin{tabular}{@{}c@{}}
\subfloat{\includegraphics[width=0.3\linewidth]{example-image-b.png}}\\ (b)
\end{tabular}
\\ [0.1cm]
\subfloat{\includegraphics[width=0.3\linewidth]{example-image-c.png}}\\ (c)
\end{tabular}
\caption{Caption.}
\end{figure}
\end{document}
```

## 5.3 Placing image anywhere You want



```
\usepackage{graphicx}
\usepackage{tikz}
\begin{document}
\begin{tikzpicture}[overlay, remember picture]
\node[anchor=north west,xshift=4cm,yshift=-11cm]
at (current page.north west)
{\includegraphics[width=5.5cm]{example-image-a.png}};
\end{tikzpicture}
\end{document}
```

## 5.4 Italic subfigure references



(a) *a* (b) *b*  
Fig. 1 *a* ← *a* in *italic* style

```
\documentclass{article}
\usepackage{graphicx}
\usepackage{subcaption}
\renewcommand\thesubfigure{\itshape\alph{subfigure}} %<--- added

\begin{document}
\begin{figure}
\centering
\begin{subfigure}{.25\textwidth}
\centering
\includegraphics[width=.6\linewidth]{example-image-a}
\caption{\textit{a}}
\label{1a}
\end{subfigure}%
\begin{subfigure}{.25\textwidth}
\centering
\includegraphics[width=.715\linewidth]{example-image-b}
\caption{\textit{b}}
\label{1b}
\end{subfigure}
\caption{}
\label{fig1}
\end{figure}
Fig. \ref{1a} $\leftarrow$ a in \textbf{\textit{italic}} style
\end{document}
```

# Chapter 6

## Numbering, enumeration, itemizing

### 6.1 Numbering in few columns

- 
- 1. c
  - 2. g
  - 3. d
  - 4. f
- 

```
\documentclass{article}
\usepackage{multicol}

\begin{document}
\begin{multicols}{2}%change to have more columns
\begin{enumerate}
\item c
\item g
\item d
\item f
\end{enumerate}
\end{multicols}
\end{document}
```

### 6.2 Enumeration environment with position number in the format (i, j)



- (1) First level-one item
- (1,1) First level-two item
- (1,2) Second level-two item
- (2) Second level-one item
- (2,1) Still another level-two item

```
\documentclass{article}
\renewcommand{\theenumi}{(\arabic{enumi})}
\renewcommand{\theenumii}{(\arabic{enumi},\arabic{enumii})}
\renewcommand{\labelenumi}{\theenumi}
\renewcommand{\labelenumii}{\theenumii}
\makeatletter \renewcommand{\p@enumii}{} \makeatother

\begin{document}
\begin{enumerate}
\item First level-one item
\begin{enumerate}
\item First level-two item
\item Second level-two item
\end{enumerate}
\item Second level-one item
\begin{enumerate}
\item Still another level-two item
\end{enumerate}
\end{enumerate}
\end{document}
```

## 6.3 Colored enumeration

- 1) item
- 2)
- 3) item
- 4)
- 5) special item
- 6)
- 7) item

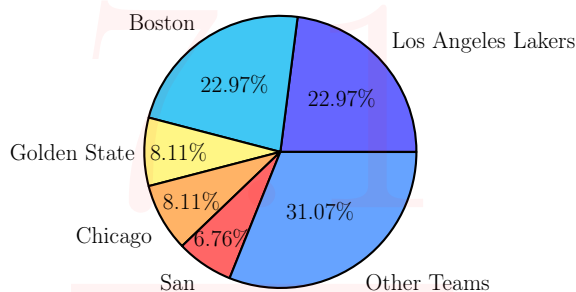
```
\documentclass{article}
\usepackage{tikz}
\definecolor{amethyst}{rgb}{0.6, 0.4, 0.8}
\definecolor{applegreen}{rgb}{0.55, 0.71, 0.0}
\definecolor{arylideyellow}{rgb}{0.91, 0.84, 0.42}
\definecolor{asparagus}{rgb}{0.53, 0.66, 0.42}
\definecolor{atomictangerine}{rgb}{1.0, 0.6, 0.4}
\definecolor{bananayellow}{rgb}{1.0, 0.88, 0.21}
\definecolor{brightgreen}{rgb}{0.4, 1.0, 0.0}
\definecolor{cambridgeblue}{rgb}{0.64, 0.76, 0.68}
\definecolor{capri}{rgb}{0.0, 0.75, 1.0}
\definecolor{carnationpink}{rgb}{1.0, 0.65, 0.79}
\newcommand{\ClaudioList}{red,applegreen,amethyst,carnationpink,blue!50!
  ↳ cyan,arylideyellow,asparagus,atomictangerine,bananayellow,brightgreen
  ↳ ,cambridgeblue,capri}
\newcommand{\SebastianoItem}[1]{\foreach \X[count=\Y] in \ClaudioList
\ifnum\Y=#1\relax
\edef\SebastianoColor{\X}
\fi}
\tikz[baseline=(SebastianoItem.base),remember
picture]{%
\node[fill=\SebastianoColor,inner sep=4pt,font=\sffamily,fill opacity=0.5] (
  ↳ SebastianoItem){#1};}
\newcommand{\SebastianoHighlight}{\tikz[overlay,remember picture]{%
\fill[\SebastianoColor,fill opacity=0.5] ([yshift=4pt,xshift=-\pgflinewidth]
  ↳ SebastianoItem.east) -- ++(4pt,-4pt)
-- ++(-4pt,-4pt) -- cycle;}}

\begin{document}
\renewcommand{\labelenumi}{\SebastianoItem{\arabic{enumi}}}
\begin{enumerate}
\item item
\item special item \SebastianoHighlight
\item item
\end{enumerate}
\end{document}
```

# Chapter 7

## Plots, tikz, pie charts ...

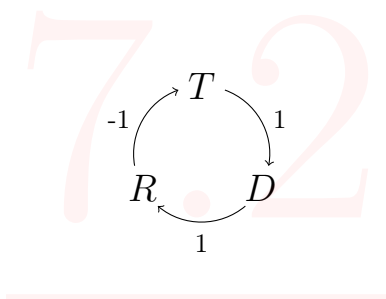
### 7.1 Simple pie chart



```
\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}
```

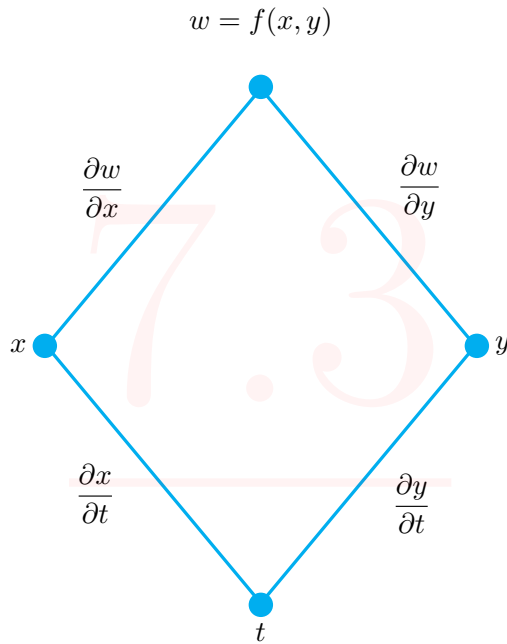
### 7.2 Circled arrows with text



```
\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] {\footnotesize 1};
\draw (-50:1cm) arc (-50:-130:1cm) node[midway, below] {\footnotesize 1};
\draw (190:1cm) arc (190:110:1cm) node[midway, left] {\footnotesize -1};
\end{tikzpicture}
\end{document}
```

## 7.3 Diamond with text



```

\documentclass[a4paper,14pt]{extreport}
\usepackage[left=1.5cm,right=1.5cm,top=1.5cm,bottom=2cm,bindingoffset=0
  \rightarrow cm]{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) {$\dfrac{\partial w}{\partial y}$};
\node [above=0.5cm,left=0.1cm] (c) at (d.135) {$\dfrac{\partial w}{\partial x}$};
\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) {$\dfrac{\partial y}{\partial t}$};
\node [below=0.5cm,left=-0.1cm] (h) at (d.220) {$\dfrac{\partial x}{\partial t}$};
\node at (d.90) [cyan,circle,fill,inner sep=3pt]{};
\node at (d.180) [cyan,circle,fill,inner sep=3pt]{};
\node at (d.0) [cyan,circle,fill,inner sep=3pt]{};
\node at (d.270) [cyan,circle,fill,inner sep=3pt]{};
\end{tikzpicture}
\end{document}

```

# Chapter 8

## Highlighting

### 8.1 Words highlighting 1

The quick brown fox jumps over the lazy dog.  
 The quick brown fox jumps over the lazy dog.

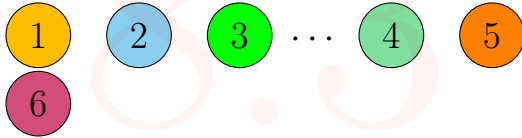
```
\documentclass{article}
\usepackage{tcolorbox}
\newtcbbox{\mybox}[1][red]{on line,
arc=0pt,outer arc=0pt,colback=#1!10!white,colframe=#1!50!black,
boxsep=0pt,left=1pt,right=1pt,top=2pt,bottom=2pt,
boxrule=0pt,bottomrule=1pt,toprule=1pt}
\newtcbbox{\xmybox}[1][red]{on line,
arc=7pt,colback=#1!10!white,colframe=#1!50!black,
before upper={\rule[-3pt]{0pt}{10pt}},boxrule=1pt,
boxsep=0pt,left=6pt,right=6pt,top=2pt,bottom=2pt}
\begin{document}
The \mybox{green}{quick} brown \mybox{fox}...\par
The \xmybox{green}{quick} brown \xmybox{fox} ...
\end{document}
```

### 8.2 Unusual words highlighting

Here You can see  
 more examples and learn  
 something new.

```
\usepackage[many]{tcolorbox}
\newtcbbox{\mylib}{enhanced,nobeforeafter, tcbox raise base, boxrule=0.4pt,
↪ top=0mm, bottom=0mm,
right=0mm, left=4mm, arc=1pt, boxsep=2pt, before upper={\vphantom{dlg
↪ }}, colframe=green!50!black, coltext=green!25!black, colback=green
↪ !10!white, overlay={\begin{tcbclipinterior} \fill[green!75!blue!50!
↪ white] (frame.south west) rectangle node[text=white,font=\sffamily\
↪ bfseries\tiny,rotate=90] {TYP} ([xshift=4mm]frame.north west);\
↪ end{tcbclipinterior}}}}
\begin{document}
\mylib{recieve}
\end{document}
```

## 8.3 Colored circles



```
\usepackage{tikz}
\usepackage[framemethod=TikZ]{mdframed}
\usepackage{xcolor}
\usetikzlibrary{calc}
\makeatletter
\newlength{\mylength}
\edef\CircleFactor{1.1}
\setlength{\mylength}{\dimexpr\f@size pt}
\newsavebox{\mybox}
\newcommand*\circled[2][draw=blue]{\savebox\mybox{\vbox{\vphantom{
  ↳ WL1/}#1}}\setlength\mylength{\dimexpr\CircleFactor\dimexpr\ht\
  ↳ mybox+\dp\mybox\relax\relax}\tikzset{mystyle/.style={circle,#1,
  ↳ minimum height={\mylength}}}\tikz[baseline=(char.base)]
\node[mystyle] (char) {#2};}
\makeatother
\definecolor{amber}{rgb}{1.0, 0.75, 0.0}
\definecolor{babyblue}{rgb}{0.54, 0.81, 0.94}
usage --> \circled[fill=amber,draw=black]{1}
```

## 8.4 Whole line colored



```
\documentclass{article}
\usepackage{xcolor}
\newcommand{\hly}[2]{\colorbox{#1!80}{\parbox{\textwidth}{#2}}}

\begin{document}
% \hly{YOURcolor}{some text}
\hly{green}{some text}
\hly{yellow}{some text}
\hly{red}{some text}
\end{document}
```

# Chapter 9

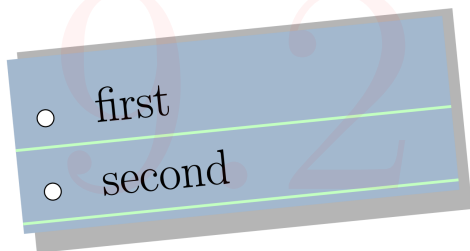
## For Fun

### 9.1 LaTeX Coffee Stains

Download `coffee4.sty` and put in the same directory

```
\documentclass{article}
\usepackage{tikz}
\usetikzlibrary{arrows,shapes}
\usepackage{coffee4}
\enum{\cofeAm{1}{0.6}{0}{0.cm}{6cm}
\cofeCm{0.9}{0.5}{180}{-7.cm}{11cm}
\cofeDm{0.4}{0.2}{90}{1.0cm}{3.0cm}
\cofeBm{0.5}{0.5}{0}{-3.cm}{10cm}
%\cofeAm{alpha}{scale}{angle}{xoff}{yoff} <-- usage
\end{document}
```

### 9.2 Sticky notes



```
\documentclass{article}
\usepackage{xparse}
\usepackage{fancy par}
\usetikzlibrary{calc,shadows}
\NewDocumentCommand\StickyNoteP{O{6cm}mO{6cm}}{%
\begin{tikzpicture}
\node[
drop shadow={shadow xshift=3pt,},
inner xsep=0pt,
xslant=-0.1,yslant=0.1,
inner ysep=0pt,
text depth=\the\dimexpr#1+2.5ex\relax
] {\parbox[t][#1][c]{#3}{#2}};
\end{tikzpicture}}

\begin{document}
\StickyNoteP[2.5cm]{%
\NotebookPar[spiral=false]{
\LARGE first\second }}[6.5cm]
\end{document}
```

## 9.3

# 9.3

```

\documentclass{article}
\usepackage{tikz}
\usetikzlibrary{fadings, shadings}
\newcounter{fadcnt}\setcounter{fadcnt}{0}
\newcommand\fadingtext[3][l]{%
\stepcounter{fadcnt}
\begin{tikzfadingfrompicture}[name=fading letter\thefadcnt]
\ode{text=transparent!0,inner xsep=0pt,outer xsep=0pt,#1} {#3};
\end{tikzfadingfrompicture}%
\begin{tikzpicture}[baseline=(textnode.base)]
\ode{inner sep=0pt,outer sep=0pt,#1}(textnode){\phantom{#3}};
\shade[path fading=fading letter\thefadcnt,#2,fit fading=false]
(textnode.south west) rectangle (textnode.north east);%
\end{tikzpicture}%
}
\usetikzlibrary{calc}
\newbox\shbox
\def\shboxset{%
\path picture shading/.style={%
\path picture={%
%
\pgfpointdiff{\pgfpointanchor{path picture bounding box}{south west}}{
\pgfpointanchor{path picture bounding box}{north east}}}%
\pgfgetlastxy\pathwidth\pathheight%
\pgfinterruptpicture%
\global\setbox\shbox=\hbox{\pgfuses shading{#1}}%
\endpgfinterruptpicture%
\pgftransformshift{\pgfpointanchor{path picture bounding box}{center}}%
\pgftransformxscale{\pathwidth/(\wd\shbox)}%
\pgftransformyscale{\pathheight/(\ht\shbox)}% \dp will (should) be 0pt
\pgftext{\box\shbox}%
%
}
}
}
\pgfdeclarehorizontalshading{rainbow}{10bp}{color(0bp)=(violet);
color(1.6667bp)=(blue);
color(3.3333bp)=(cyan);
color(5bp)=(green);
color(6.6667bp)=(yellow);
color(8.3333bp)=(orange);
color(10bp)=(red)}
\begin{document}
\fadingtext[scale=10, font=\bfseries]{upper left=red, upper right=green,
↪ lower left=blue,lower right=yellow}{\LaTeX}

\fadingtext[scale=10, font=\bfseries]{path picture shading=rainbow}{\LaTeX}

\noindent\fadingtext[scale=0.7, font=\bfseries]{path picture shading=
↪ rainbow}{\parbox[b]{1.5\linewidth}{\strut\lipsum[1]}}
\end{document}

```

## 9.5 Full page of Watermarks

```

\documentclass[12pt]{book}
\usepackage{graphicx}
\usepackage[pages=some]{background}
\usepackage{lipsum}
\newcommand\DupImage{%
  \includegraphics[width=5cm]{logo.jpeg}\hfill% YOUR IMAGE
  \includegraphics[width=5cm]{logo.jpeg}\hfill% YOUR IMAGE
  \includegraphics[width=5cm]{logo.jpeg}\hfill% YOUR IMAGE
  \includegraphics[width=5cm]{logo.jpeg}\hfill% YOUR IMAGE
  \includegraphics[width=5cm]{logo.jpeg}\hfill% YOUR IMAGE
  \includegraphics[width=5cm]{logo.jpeg}\hfill% YOUR IMAGE
  \includegraphics[width=5cm]{logo.jpeg}\hfill}
\newlength{\drop}
\backgroundsetup{ scale=1, angle=45, opacity=.3,
  contents={%
    \begin{minipage}{1.5\paperheight}
    \DupImage\ \2ex
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    \DupImage\end{minipage} } }

\begin{document}
\drop=0.1\textheight \BgThispage \lipsum[1-8]
\end{document}

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