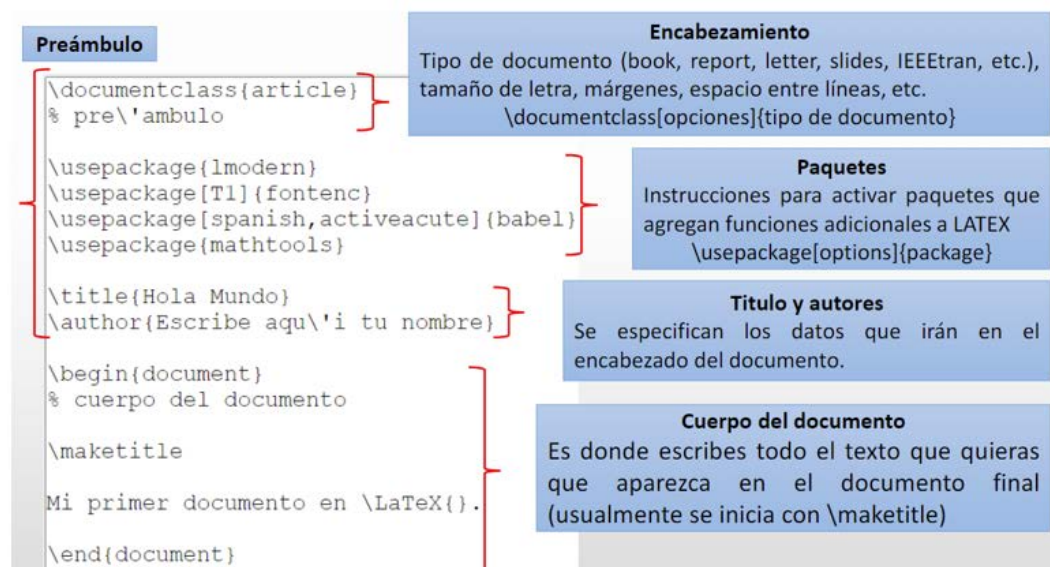# CURSO EXPRESS

LATEX

Overleaf

DIVISIÓN DE ESTUDIOS DE POSGRADO E INVESTIGACIÓN

TECNM-ORIZABA

INTRODUCCIÓN

LATEX es un sistema de composición de textos, orientado a la creación de documentos escritos que presenten una alta calidad tipográfica.

LaTeX está formado por un gran conjunto de macros de TeX (sistema de tipografía) escrito por Leslie Lamport en 1984, con la intención de facilitar el uso del lenguaje de composición tipográfica.

PARTES DE UN DOCUMENTO DE LATEX

Preámbulo

```
\documentclass{article}
% pre\'ambulo

\usepackage{lmodern}
\usepackage[T1]{fontenc}
\usepackage[spanish,activeacute]{babel}
\usepackage{mathtools}

\title{Hola Mundo}
\author{Escribe aqu\'i tu nombre}

\begin{document}
% cuerpo del documento

\maketitle

Mi primer documento en \LaTeX{}.

\end{document}
```

Encabezamiento
Tipo de documento (book, report, letter, slides, IEEEtran, etc.), tamaño de letra, márgenes, espacio entre líneas, etc.
\documentclass[opciones]{tipo de documento}

Paquetes
Instrucciones para activar paquetes que agregan funciones adicionales a LATEX
\usepackage[options]{package}

Titulo y autores
Se especifican los datos que irán en el encabezado del documento.

Cuerpo del documento
Es donde escribes todo el texto que quieras que aparezca en el documento final (usualmente se inicia con \maketitle)
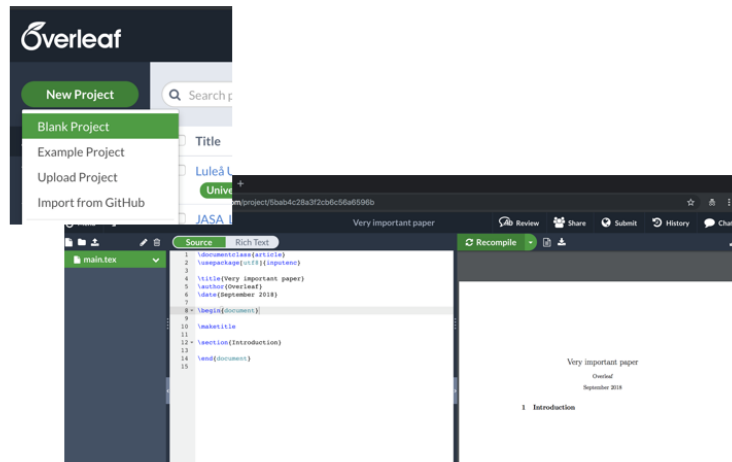
CREANDO UN DOCUMENTO EN OVERLEAF

1) Ir a Overleaf -> www.overleaf.com

2) Registrarse

3) Empezar un nuevo proyecto. Dar clic a New Project y luego a Blank Project

4) Escribir el código


```
1
2   % Ejemplo 1. Hola Mundo
3
4   \documentclass{article}
5
6   \begin{document}
7
8   Este es mi "Hola Mundo de LATEX"
9
10  \end{document}
11
```

5) Compilar

Este es mi "Hola Mundo de LATEX"

```
 1
 2   % Ejemplo 2.  Utilización de los Caracteres Especiales
 3
 4   \documentclass[12pt, letterpaper]{article}
 5   %Indica la creación del documento con un tamaño de la letra de
     12pt, tipo de hoja letterpaper y tiene un formato de tipo
     article
 6
 7
 8   \usepackage{graphicx}
 9   %Se incluyen la paquetería graphicx para poder utilizar los
     caracteres especiales
10
11 ▾ \begin{document}
12
13   Este ejemplo tiene un costo de \$ 0.0 pesos y tiene el
     objetivo de que el 100\% de los participantes \& invitados
     entiendan la forma en como se colocan caracteres como \#, $>$,
     $<$ dentro de Latex para que en la compilación no les genere
     error.
14
15
16   \end{document}
```

Character	Command	Function in LaTeX
$	\$	A pair of $ creates a math-mode* within text-mode.
%	\%	Texts of a line preceded by % are commented.
{ }	\{ \}	Mandatory arguments of a command are written within {}.
_	_	Generates a subscript in math-modes.
^	\^	Generates a superscript in math-modes.
&	\&	Separates the entries of two columns in a Table.
#	\#	Miscellaneous symbol.
\	$\backslash$	Most of the LaTeX commands start with \.
~	$\sim$	Binds two words to be printed in the same line.
|	$\|$	Generates a vertical (column) line in a Table.
<	$<$	—
>	$>$	—

Este ejemplo tiene un costo de $ 0.0 pesos y tiene el objetivo de que el 100% de los participantes & invitados entiendan la forma en como se colocan caracteres como #, >, < dentro de Latex para que en la compilación no les genere error.

```
1
2   % Ejemplo 3. Utilización de tipos de fuentes
3
4   \documentclass{article}
5   \usepackage[T1]{fontenc}
6   \usepackage{tgbonum}
7
8   \begin{document}
9   This document is a sample document to
10  test font families and font typefaces.
11  \newline
12
13
14  {\fontfamily{qcr}\selectfont
15  This text uses a different font typeface
16  }
17
18  \end{document}
```

Computer Modern Roman		cmr	The quick brown fox jumps over the lazy dog ąółöçæš 0123456789
Latin Modern Roman	lmodern	lmr	The quick brown fox jumps over the lazy dog ąółöçæš 0123456789
Latin Modern Dunhill	lmodern	lmdh	The quick brown fox jumps over the lazy dog ąółöçæš 0123456789
TEX Gyre Termes	tgtermes	qtm	The quick brown fox jumps over the lazy dog ąółöçæš 0123456789
TEX Gyre Pagella	tgpagella	qpl	The quick brown fox jumps over the lazy dog ąółöçæš 0123456789
TEX Gyre Bonum	tgbonum	qbk	The quick brown fox jumps over the lazy dog ąółöçæš 0123456789

This document is a sample document to test font families and font typefaces.

This text uses a different font typeface

```
1   % Ejemplo 4. Utilización del formato Bold, italic, emphasized,
    etc.
2
3   \documentclass{article}
4   \usepackage[T1]{fontenc}
5   \usepackage{tgbonum}
6
7   \begin{document}
8
9   Esto es un ejemplo.
10  \textbf{Esto es un Boldface}.
11  \textit{Esto es Italic Shape}.
12  \emph{Esto es Emphasized}. \\
13
14  Esto es un ejemplo. \\
15  \textbf{Esto es un Boldface}. \\
16  \textit{Esto es Italic Shape}. \\
17  \emph{Esto es Emphasized}. \\
18
19  \small Esto es texto pequeño \\
20  \large Esto es texto grande \\
21  \huge  Esto es texto enorme \\
22
23  \end{document}
```

SN	Type	Variety	Command	Declaration
1	Family	Serif family (default)	\textrm{atext} or {\rm atext}	\rmfamily
		Sans serif family	\textsf{atext} or {\sf atext}	\sffamily
		Typewriter family	\texttt{atext} or {\tt atext}	\ttfamily
2	Series	Medium series (default)	\textmd{atext}	\mdseries
		Boldface series	\textbf{atext} or {\bf atext}	\bfseries
3	Shape	Upright shape (default)	\textup{atext}	\upshape
		Italic shape	\textit{atext} or {\it atext}	\itshape
		Slanted shape	\textsl{atext} or {\sl atext}	\slshape
		CAPS & SMALL CAPS SHAPE	\textsc{atext} or {\sc atext}	\scshape
		Emphasized shape	\emph{atext} or {\em atext}	—
4	Size	Tiny size	{\tiny atext}	\tiny
		Script size	{\scriptsize atext}	\scriptsize
		Foot note size	{\footnotesize atext}	\footnotesize
		Small size	{\small atext}	\small
		Normal size (default)	–	\normalsize
		Large size	{\large atext}	\large
		Larger size	{\Large atext}	\Large
		Largest size	{\LARGE atext}	\LARGE
		Huge size	{\huge atext}	\huge
		Hugest size	{\Huge atext}	\Huge

This document is a sample document to test font families and font typefaces.

This text uses a different font typeface

```latex
% Ejemplo 5. Utilización de Colores

\documentclass{article}
\usepackage{xcolor}
\begin{document}
This example shows some instances of using the \texttt{xcolor} package
to change the colour of elements in \LaTeX %pone el logo de LaTex.

\color{blue}
First item \\
Second item

\noindent %quita la sangría.

{\color{red} \rule{\linewidth}{0.5mm}}
\end{document}
```

`\usepackage{xcolor}`

`\usepackage[dvipsnames]{xcolor}`

red
green
blue
cyan
magenta
yellow
black
gray
white
darkgray
lightgray
brown
lime
olive
orange
pink
purple
teal
violet

Apricot	Aquamarine	Bittersweet	Black
Blue	BlueGreen	BlueViolet	BrickRed
Brown	BurntOrange	CadetBlue	CarnationPink
Cerulean	CornflowerBlue	Cyan	Dandelion
DarkOrchid	Emerald	ForestGreen	Fuchsia
Goldenrod	Gray	Green	GreenYellow
JungleGreen	Lavender	LimeGreen	Magenta
Mahogany	Maroon	Melon	MidnightBlue
Mulberry	NavyBlue	OliveGreen	Orange
OrangeRed	Orchid	Peach	Periwinkle
PineGreen	Plum	ProcessBlue	Purple
RawSienna	Red	RedOrange	RedViolet
Rhodamine	RoyalBlue	RoyalPurple	RubineRed
Salmon	SeaGreen	Sepia	SkyBlue
SpringGreen	Tan	TealBlue	Thistle
Turquoise	Violet	VioletRed	White
WildStrawberry	Yellow	YellowGreen	YellowOrange

This document is a sample document to test font families and font typefaces.

This text uses a different font typeface

```latex
% Ejemplo 5.2 Utilización de Colores

\documentclass{article}
\usepackage[usenames,dvipsnames]{color} %using the color
package, not xcolor
\begin{document}
This example shows how to use the \texttt{\bfseries color}
package to change the colour of \LaTeX{} page elements.

\begin{itemize}
\color{ForestGreen}
\item First item
\item Second item
\end{itemize}

\noindent
{\color{RubineRed} \rule{\linewidth}{0.5mm}}

The background colour of text can also be \textcolor{red}
{easily} set. For  instance, you can change use an
\colorbox{BurntOrange}{orange background} and then continue
typing.

\end{document}
```

This document is a sample document to test font families and font typefaces.

This text uses a different font typeface

```
1   % Ejemplo 5.2 Utilización de Colores
2
3   \documentclass{article}
4   \usepackage[dvipsnames]{xcolor}
5
6   \colorlet{LightRubineRed}{RubineRed!70}
7   \colorlet{Mycolor1}{green!10!orange}
8   \definecolor{Mycolor2}{HTML}{00F9DE}
9
10  \begin{document}
11  \pagecolor{black}
12  \color{white}% set the default colour to white
13  This document presents several examples showing how to use the
    \texttt{xcolor} package
14  to change the colour of \LaTeX{} page elements.
15
16  \begin{itemize}
17  \item \textcolor{Mycolor1}{First item}
18  \item \textcolor{Mycolor2}{Second item}
19  \end{itemize}
20
21  \noindent
22  {\color{LightRubineRed} \rule{\linewidth}{1mm}}
23
24  \noindent
25  {\color{RubineRed} \rule{\linewidth}{1mm}}
26  \end{document}
```

This document is a sample document to test font families and font typefaces.

This text uses a different font typeface

```latex
% Ejemplo 6 Utilización de Subsection y Etiquetas (Labels)

\documentclass{article}
\usepackage{hyperref}

\begin{document}
\section{Centre of gravity}\label{cgravity}
This is the point though which the resultant of the
gravitational forces of all elemental weights of a body acts.

\section{Centre of mass}\label{cmass}
La definición del centro de gravedad estuvo definida en la
sección \ref{cgravity}. Mientras que la definición de centro
de masa se encuentra en la sección \ref{cmass}. \\

The definition of the centre of gravity is given in Section.

\subsection{Explicación de subsection}\label{expsub}
Esta subsección \ref{expsub} pertenece a la sección
\ref{cmass} y sirve para explicar su uso. Esta subsección
\ref{expsub} se encuentran en la página \pageref{expsub}.

\end{document}
```

1 Centre of gravity

This is the point though which the resultant of the gravitational forces of all elemental weights of a body acts.

2 Centre of mass

La definición del centro de gravedad estuvo definida en la sección 1. Mientras que la definición de centro de masa se encuentra en la sección 2.

The definition of the centre of gravity is given in Section.

2.1 Explicación de subsection

Esta subsección 2.1 pertenece a la sección 2 y sirve para explicar su uso. Esta subsección 2.1 se encuentran en la página 1.

```latex
% Ejemplo 6 Utilización de Subsection y Etiquetas (Labels)

\documentclass{article}
\usepackage{hyperref}

\begin{document}
\section{Centre of gravity}\label{cgravity}
This is the point though which the resultant of the
gravitational forces of all elemental weights of a body acts.

\section{Centre of mass}\label{cmass}
La definición del centro de gravedad estuvo definida en la
sección \ref{cgravity}. Mientras que la definición de centro
de masa se encuentra en la sección \ref{cmass}. \\

The definition of the centre of gravity is given in Section.

\subsection{Explicación de subsection}\label{expsub}
Esta subsección \ref{expsub} pertenece a la sección
\ref{cmass} y sirve para explicar su uso. Esta subsección
\ref{expsub} se encuentran en la página \pageref{expsub}.

\end{document}
```

1 Centre of gravity

This is the point though which the resultant of the gravitational forces of all elemental weights of a body acts.

2 Centre of mass

La definición del centro de gravedad estuvo definida en la sección 1. Mientras que la definición de centro de masa se encuentra en la sección 2.

The definition of the centre of gravity is given in Section.

2.1 Explicación de subsection

Esta subsección 2.1 pertenece a la sección 2 y sirve para explicar su uso. Esta subsección 2.1 se encuentran en la página 1.

```latex
 2  % Ejemplo 7. Formato Alineación Texto
 3
 4  \documentclass{article}
 5
 6  \begin{document}
 7
 8  \begin{flushleft}
 9  \LaTeX\ prints texts with both side aligned.
10  Left aligned texts can be produced through
11  the 'flushleft' environment.
12  \end{flushleft}
13
14  \begin{flushright}
15  \LaTeX\ prints texts with both side aligned.
16  Right aligned texts can …
17  \end{flushright}
18
19  \begin{center}
20  \LaTeX\ prints texts with both side aligned.
21  Center aligned texts can …
22  \end{center}
23
24  \end{document}
```

LATEX prints texts with both side aligned. Left aligned texts can be produced through the 'flushleft' environment.

LATEX prints texts with both side aligned. Right aligned texts can ...

LATEX prints texts with both side aligned. Center aligned texts can ...

```latex
 2  %Ejemplo 9. Uso del Quote
 3
 4  \documentclass{article}
 5  \usepackage[spanish]{babel}
 6  \usepackage{csquotes}
 7
 8  \begin{document}
 9  \section{Introducción}
10
11  La siguiente frase es atribuída a Linus Torvals:
12
13  \begin{displayquote}
14  Sé que tengo un ego del tamaño de un planeta pequeño, pero
    incluso yo a veces me equivoco.
15      \begin{flushright}
16          {Linus Torvals}
17      \end{flushright}
18  \end{displayquote}
19
20  La frase revela un aspecto importante de su \textquote{jocosa}
    personalidad.
21  \end{document}
```

1. Introducción

La siguiente frase es atribuída a Linus Torvals:

> Sé que tengo un ego del tamaño de un planeta pequeño, pero incluso yo a veces me equivoco.
>
> Linus Torvals

La frase revela un aspecto importante de su «jocosa» personalidad.

```latex
% Ejemplo 10. Uso de los Espaciados Verticales y Horizontales

\documentclass{article}
\begin{document}

\begin{center}
\LaTeX\ in 24 Hours\bigskip\\
A Practical Guide for Scientific Writing
\end{center}

\begin{flushright}
    \LaTeX\ in 24 Hours
    \vskip 8mm
    A Practical Guide for Scientific Writing
\end{flushright}

\begin{flushleft}
    \LaTeX\ in 24 Hours
    \vspace{8mm}\\
    A Practical Guide for Scientific Writing
\end{flushleft}

\vskip 15mm
Writing language: \hspace{5mm} English.

\vskip 20mm
Marks: 100 \hfill Time: 3 Hours.

\end{document}
```

$\LaTeX$ in 24 Hours

A Practical Guide for Scientific Writing

$\LaTeX$ in 24 Hours

A Practical Guide for Scientific Writing

$\LaTeX$ in 24 Hours

A Practical Guide for Scientific Writing

Writing language: English.

Marks: 100   Time: 3 Hours.

Chapter 1

Changed Headings

1.1 New form of Section

1.1.1 New form of Sub-section also

```
1
2   % Ejemplo 12. Uso de la configuraciones de las COLUMNAS
3
4   \documentclass[twocolumn]{article}
5   \columnseprule = 1mm
6   \usepackage{blindtext}
7   %
8   \begin{document}
9       \blindtext[10]
10  \end{document}
```

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, con-

sectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem.

1

```latex
1
2   % Ejemplo 13. Uso de la configuraciones de las COLUMNAS
3
4   \documentclass[11pt,a4paper]{article}
5   \usepackage{multicol}
6   \usepackage{blindtext}
7   \columnseprule = 0.5mm
8   %
9   \begin{document}
10  \blindtext
11
12  \begin{multicols}{3}
13  \blindtext
14  \end{multicols}
15  %
16  \blindtext
17  \end{document}
```

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

```
1
2   % Ejemplo 14. Uso del footnote
3
4   \documentclass{article}
5
6▾  \begin{document}
7   Both Rubi and Lila\footnote{They are sisters.} study in class I, while
    Ravi and Joy\footnote{They are friends.\label{fn:friends}} study in
    class II.
8   \end{document}
```

Both Rubi and Lila[1] study in class I, while Ravi and Joy[2] study in class II.

---

[1] They are sisters.
[2] They are friends.

1

```
1   % Ejemplo 15. Tablas
2
3   \documentclass{article}
4   \usepackage{rotating}
5   \usepackage{longtable}
6   \usepackage{multirow}
7
8   \title{EJEMPLOS CON TABLAS}
9   \author{Autor: Oscar Sandoval}
10
11  \begin{document}
12  \maketitle
13      \section{A simple Table}
14          \begin{table}[!hbt]
15              \centering
16              \caption{Obtained marks}
17              \vspace{5mm}
18              \label{Tabla1}
19
20              \begin{tabular}{|c|c|c|c|c|}
21                  \hline Name & Math & Phy & Chem & English \\
22                  \hline Robin & 80 & 68 & 70 & 90 \\
23                  \hline Julie & 80 & 90 & 90 & 90 \\
24                  \hline Robert & 90 & 80 & 80 & 80 \\
25                  \hline
26              \end{tabular}
27
28          \end{table}
```

```
30  \begin{table}[h]
31   \centering
32   \caption{Ejercicio 2}
33   \label{tab:Tabla2}
34   \begin{tabular}{|l|l|l|l|l|}
35   \hline
36   V1  & V2  & V3  & V4  & V5  \\ \hline
37   12  & 23  & 23  & 23  & 23  \\ \hline
38   34  & 234 & 23  & 23  & 23  \\ \hline
39   56  & 87  & 65  & 45  & 23  \\ \hline
40   324 & 456 & 456 & 876 & 345 \\ \hline
41   \end{tabular}
42   \end{table}
```

```
43
44   \begin{table}[h]
45   \centering
46   \caption{}
47   \label{tab:my-table}
48   \begin{tabular}{|c|l|l|l|}
49   \hline
50   \multicolumn{1}{|l|}{} & \multicolumn{1}{c|}{V1} & \multicolumn{1}{c|}
     {V2} & \multicolumn{1}{c|}{V3} \\ \hline
51   N1                     & 1 & 4 & 2 \\ \hline
52   \multirow{2}{*}{N2} & 3 & 3 & 3 \\ \cline{2-4}
53                          & 2 & 4 & 4 \\ \hline
54   N3                     & 4 & 3 & 2 \\ \hline
55   \multirow{2}{*}{N4} & 3 & 2 & 3 \\ \cline{2-4}
56                          & 2 & 1 & 2 \\ \hline
57   \end{tabular}
58   \end{table}
59
60
61   \end{document}
```

EJEMPLOS CON TABLAS

Autor: Oscar Sandoval

July 1, 2024

1   A simple Table

Table 1: Obtained marks

Name	Math	Phy	Chem	English
Robin	80	68	70	90
Julie	80	90	90	90
Robert	90	80	80	80

Table 2: Ejercicio 2

V1	V2	V3	V4	V5
12	23	23	23	23
34	234	23	23	23
56	87	65	45	23
324	456	456	876	345

Table 3:

	V1	V2	V3
N1	1	4	2
N2	3	3	3
	2	4	4
N3	4	3	2
N4	3	2	3
	2	1	2

1

```latex
1
2  % EJEMPLO 16. EJEMPLO ITEMIZE
3
4  \documentclass{article}
5  \begin{document}
6
7  \section{Unnumbered listing}
8
9      \begin{itemize}
10         \item Assam
11         \item Bihar
12         \item Punjab
13         \item Rajasthan.
14     \end{itemize}
15
16  \section{Nested unnumbered listing}
17      \begin{itemize}
18         \item Mexico
19         \begin{itemize}
20             \item Veracruz
21             \begin{itemize}
22                 \item Orizaba
23                 \begin{itemize}
24                     \item Centro
25                     \item Emiliano Zapata
26                 \end{itemize}
27             \item Cordoba
28             \item Rio Blanco
29         \end{itemize}
```

```latex
30         \item Aguascalientes
31         \item Zacatecas
32         \end{itemize}
33     \item USA
34     \end{itemize}
35  \end{document}
```

1 Unnumbered listing

- Assam
- Bihar
- Punjab
- Rajasthan.

2 Nested unnumbered listing

- Mexico
  - Veracruz
    * Orizaba
      · Centro
      · Emiliano Zapata
    * Cordoba
    * Rio Blanco
  - Aguascalientes
  - Zacatecas
- USA

```latex
1
2  %EJEMPLO 17.  TABLES
3
4  \documentclass{article}
5  \usepackage{rotating}
6
7  \title{EJEMPLOS CON TABLAS}
8  \author{Autor: Oscar Sandoval}
9
10
11
12  \begin{document}
13  \maketitle
14    \section{A simple Table}
15      \begin{table}[!hbt]
16          \centering
17          \caption{Obtained marks.}
18          \label{tab-marks}
19          \begin{tabular}{|c|c|c|c|c|}  %Genera 5 columnas
20              \hline Name & Math & Phy & Chem & English\\ %el & separa
                  los valores
21              \hline Robin & 80 & 68 & 60 & 57\\
22              \hline Julie & 72 & 62 & 66 & 63\\
23              \hline Robert & 75 & 70 & 71 & 69\\
24              \hline
25          \end{tabular}
26      \end{table}
```

```latex
28  \section{Tabla con entradas de dirección vertical}
29      \begin{table}[!hbt]
30          \centering
31          \caption{Tabla con entradas de dirección vertical}
32          \label{tab-marks_vertical}
33      \begin{tabular}{|c|c|c|c|}
34          \hline Name&
            \begin{sideways}Mathematics\end{sideways}&\begin{sideways}Physi
            cs\end{sideways}&\begin{sideways}Chemistry\end{sideways}\\
35          \hline Robin & 80 & 68 & 60\\
36          \hline Julie & 72 & 62 & 66\\
37          \hline Robert & 75 & 70 & 71\\
38          \hline
39      \end{tabular}
40  \end{table}
41
42  Como se puede apreciar en la Tabla \ref{tab-marks} es una tabla
    simple. Y en la tabla \ref{tab-marks_vertical} es una tabla con
    entradas en dirección vertical.
43
44  \end{document}
```

EJEMPLOS CON TABLAS

Autor: Oscar Sandoval

July 1, 2024

1 A simple Table

Table 1: Obtained marks.

Name	Math	Phy	Chem	English
Robin	80	68	60	57
Julie	72	62	66	63
Robert	75	70	71	69

2 Tabla con entradas de dirección vertical

Table 2: Tabla con entradas de dirección vertical

Name	Mathematics	Physics	Chemistry
Robin	80	68	60
Julie	72	62	66
Robert	75	70	71

Como se puede apreciar en la Tabla 1 es una tabla simple. Y en la tabla 2 es una tabla con entradas en dirección vertical.

```
1   %Ejemplo 18. Article Template
2
3   \documentclass{article}
4   \title{A Small \LaTeX{} Article Template\thanks{To your mother}}
5   \author{Your Name  \\
6           Your Company / University  \\
7           \and
8           The Other Dude \\
9           His Company / University \\
10          }
11
12  \date{\today}
13  % Hint: \title{what ever}, \author{who care} and \date{when ever}
    could stand
14  % before or after the \begin{document} command
15  % BUT the \maketitle command MUST come AFTER the \begin{document}
    command!
16  \begin{document}
17
18  \maketitle
19
20
```

```
21 ▾ \begin{abstract}
22    Short introduction to subject of the paper \ldots
23    \end{abstract}
24
25 ▾ \section{Introduction}
26    Make it possible for all to write documents with \LaTeX{}!
27
28 ▾ \paragraph{Outline}
29    First we start with a little example of the article class, which is an
30    important documentclass. But there would be other documentclasses like
31    book \ref{book}, report \ref{report} and letter \ref{letter} which are
32    described in Section \ref{documentclasses}. Finally, Section
33    \ref{conclusions} gives the conclusions.
34
35
36 ▾ \section{Documentclasses} \label{documentclasses}
37 ▾ \begin{itemize}
38    \item article
39    \item book
40    \item report
41    \item letter
42    \end{itemize}
```

```
44  \begin{enumerate}
45  \item article
46  \item book
47  \item report
48  \item letter
49  \end{enumerate}
50
51  \begin{description}
52  \item[article\label{article}]{Article is \ldots}
53  \item[book\label{book}]{The book class \ldots}
54  \item[report\label{report}]{Report gives you \ldots}
55  \item[letter\label{letter}]{If you want to write a letter.}
56  \end{description}
57
58  \section{Conclusions}\label{conclusions}
59  There is no longer \LaTeX{} example which was written by \cite{doe}.
60
61  \begin{thebibliography}{9}
62  \bibitem[Doe]{doe} \emph{First and last \LaTeX{} example.},
63  John Doe 50 B.C.
64  \end{thebibliography}
65
66  \end{document}
```

A Small LaTeX Article Template*

Your Name   The Other Dude
Your Company / University   His Company / University

July 1, 2024

Abstract

Short introduction to subject of the paper . . .

1 Introduction

Make it possible for all to write documents with LaTeX!

Outline   First we start with a little example of the article class, which is an important documentclass. But there would be other documentclasses like book 2, report 2 and letter 2 which are described in Section 2. Finally, Section 3 gives the conclusions.

2 Documentclasses

- article
- book
- report
- letter

1. article
2. book
3. report
4. letter

article Article is . . .

---

*To your mother

```
1
2   %Ejemplo 19. Blindtext, geometry
3
4   \documentclass{article}
5   \usepackage{blindtext}
6   \usepackage{geometry}
7   \geometry{
8   a4paper,
9   total={190mm,257mm},
10  left=10mm,
11  top=10mm,
12  }
13  \begin{document}
14  \section{Some dummy text}
15  \blindtext[10]
16  \end{document}
```

1 Some dummy text

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit

```latex
1   % Ejemplo 20. ECUACIONES
2
3   \documentclass{article}
4
5   \usepackage{amsmath}
6   \usepackage{mathtools}
7   \usepackage{xfrac}
8
9   \title{EJEMPLOS \LaTeX DE ECUACIONES}
10  Press 'Space' for TeXGPT and more AI
11  \begin{document}
12  \maketitle
13      \begin{equation}
14          x + y = 4 % there should be no gap between any of the two rows
15      \end{equation}
16          \newline
17
18      \begin{equation}
19          x^2 +2x+ 6 = 0
20      \end{equation}
21      \begin{equation}
22          x^3 + y^3 = 9
23      \end{equation}
24      \begin{equation}
25          x^2 + 2x + 4 = 0
26      \end{equation}
27      \begin{equation}
28          y^2 + 4y = 5
```

```
29      \end{equation}
30      \newline
31
32 ▾    \begin{equation}
33          \cos^2 \theta + \sin^2 \theta = 1
34      \end{equation}
35      \newline
36
37      %POWER AND INDICES
38 ▾    \begin{equation}
39          k_n = k_{n-1} + k_{n-2}
40      \end{equation}
41
42 ▾    \begin{align*}
43          r(x) = \frac{1}{x^2 + y^2 + z^2} = 1 \\ \\ % you can insert
            any type of fraction according to the requirements.
44          g(x) = \frac{\frac{1}{a}+\frac{1}{b}}{a - b} \\ \\
45          f(x) = \frac{a - b}{\frac{1}{a} - \frac{1}{b}} \\
46      \end{align*}
47
48 ▾    \begin{equation}
49          \sum_{i=0}^{N - 1} a_i % you can modify the values according
            to the requirements
50      \end{equation}
51
```

```
53      \[
54          \begin{bmatrix} % you can specify any environment according to
            your choice
55          A & B & C \\
56          D & E & F \\
57          G & H & I
58          \end{bmatrix}
59          =
60          \begin{bmatrix}
61          J & K & L \\
62          M & N & O \\
63          P & Q & R
64          \end{bmatrix}
65      \]
66
67      \[ f(x) =
68          \begin{cases}
69              x^2 + 2x        & \quad \text{if } x \text{ is greater than
                0}\\ % the text command is just used for the formatting
70              0  & \quad \text{if } x \text{ is less than 0} % the \quad
                command maintains the distance between the text and the
                math variable
71          \end{cases}
72      \]
```

```
74      \[
75          \left( \int_{0}^{n} f(x)\,dx\right)=g(x).
76      \]
77
78      \[
79        \frac{d}{dy}\left( \int_{0}^{y} f(x)\,dx\right)=g(y).
80      \]
81
82
83 ▾    \begin{equation}
84      x= \frac{-b \pm \sqrt{b^2 -4ac}}{2a}
85      \end{equation}
86
87      This sentence uses  delimiters to show math inline:  $\sqrt{3x-1}+
        (1+x)^2$
88
89
90  \end{document}
```

EJEMPLOS LaTeX DE ECUACIONES

July 1, 2024

$$x + y = 4 \tag{1}$$

$$x^2 + 2x + 6 = 0 \tag{2}$$

$$x^3 + y^3 = 9 \tag{3}$$

$$x^2 + 2x + 4 = 0 \tag{4}$$

$$y^2 + 4y = 5 \tag{5}$$

$$\cos^2 \theta + \sin^2 \theta = 1 \tag{6}$$

$$k_n = k_{n-1} + k_{n-2} \tag{7}$$

$$r(x) = \frac{1}{x^2 + y^2 + z^2} = 1$$

$$g(x) = \frac{\frac{1}{a} + \frac{1}{b}}{a - b}$$

$$f(x) = \frac{a - b}{\frac{1}{a} - \frac{1}{b}}$$

```latex
1   % ECUACIONES
2
3   \documentclass{article}
4
5   \usepackage{amsmath}
6   \usepackage{mathtools}
7   \usepackage{xfrac}
8
9   \title{EJEMPLOS DE ECUACIONES}
10
11  \begin{document}
12  \maketitle
13
14  como dice la ecuación \ref{eq:1}
15
16      \begin{equation}
17      \label{eq:1}
18          x+y=4;
19      \end{equation}
20
21      \begin{equation}
22      \label{eq:2}
23          x^2+2x+6=0
24      \end{equation}
25
26      \begin{equation}
27          x^3+y^3=9
28      \end{equation}
29
```

```
30    \begin{equation}
31        \cos^2\theta+\sin^2\theta=1
32    \end{equation}
33
34    \begin{equation}
35        k_n=k_{n-1}+k_{n-2}
36    \end{equation}
37
38    \begin{align*}
39        r(x)=\frac{1}{x^2+y^2+z^2}=1   \\
40        g(x)=\frac{\frac{1}{a}+\frac{1}{b}}{a-b} \\
41        f(x)=\frac{a-b}{\frac{1}{a}-\frac{1}{b}}
42    \end{align*}
43
44    \begin{equation}
45        \sum_{i=0}^{N-1}a_i
46    \end{equation}
47
```

```latex
50  \begin{equation}
51      \begin{bmatrix}
52          A&B&C\\
53          D&E&F\\
54          G&H&I
55      \end{bmatrix}
56  =
57      \begin{bmatrix}
58          J&K&L\\
59          M&N&O\\
60          P&Q&R
61      \end{bmatrix}
62  \end{equation}
63
64  \begin{equation}
65      f(x)=
66      \begin{cases}
67          x^2+2x    &\quad \text{if } x \text{ is greater than 0}\\
68          0         &\quad \text{is less than 0}
69      \end{cases}
70  \end{equation}
71
72  \begin{equation}
73      \left(\int_{0}^{n}f(x)\,dx \right)=g(x)
74  \end{equation}
```

```latex
76  \begin{equation}
77      \frac{d}{dy}\left(\int_{0}^{y}f(x)\,dx\right)=g(y)
78  \end{equation}
79
80  This sentece uses a delimiters to show math inline: $\sqrt{3x-1}+
    (1+x)^2$
81
82  \end{document}
```

EJEMPLOS LATEX

July 1, 2024

$$x + y = 4 \tag{1}$$

$$x^3 + y^3 = 9 \tag{2}$$

$$x^2 + 2x + 4 = 0 \tag{3}$$

$$y^2 + 4y = 5 \tag{4}$$

$$\cos^2\theta + \sin^2\theta = 1 \tag{5}$$

Como dice la ecuación 5 me dice que blablabla

$$k_n = k_{n-1} + k_{n-2} \tag{6}$$

$$r(x) = \frac{1}{x^2 + y^2 + z^2} = 1 \tag{7}$$

$$g(x) = \frac{\frac{1}{a} + \frac{1}{b}}{a - b} \tag{8}$$

$$f(x) = \frac{a - b}{\frac{1}{a} - \frac{1}{b}} \tag{9}$$

$$r(x) = \frac{1}{x^2 + y^2 + z^2} = 1 \tag{10}$$

$$g(x) = \frac{\frac{1}{a} + \frac{1}{b}}{a - b} \tag{11}$$

$$f(x) = \frac{a - b}{\frac{1}{a} - \frac{1}{b}} \tag{12}$$

$$\tag{13}$$

$$r(x) = \frac{1}{x^2 + y^2 + z^2} - 1 \tag{14}$$

$$g(x) = \frac{\frac{1}{a} + \frac{1}{b}}{a - b} \tag{15}$$

$$f(x) = \frac{a - b}{\frac{1}{a} - \frac{1}{b}} \tag{16}$$

$$\tag{17}$$

$$\sum_{i=0}^{N-1} a_i \tag{18}$$

$$\begin{bmatrix} A & B & C \\ D & E & F \\ G & H & I \end{bmatrix} = \begin{bmatrix} J & K & L \\ M & N & O \\ P & Q & R \end{bmatrix}$$

$$f(x) = \begin{cases} x^2 + 2x & \text{if x is greater than 0 x>0} \\ 0 & \text{if x is less than 0} \end{cases}$$

$$\left(\int_0^n f(x)\, dx \right) = g(x)$$

```latex
1   \documentclass{article}
2
3   \usepackage{graphicx}
4   \usepackage{blindtext}
5
6   \title{LATEX EJEMPLOS CON FIGURAS}
7
8   \begin{document}
9       \maketitle
10      \blindtext[2]\\
11
12
13      %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
14      \begin{figure}[ht]
15      %\hspace{0mm}
16          \begin{flushright}
17              \includegraphics[scale=0.3]{robot1.jpg}
18              \caption{Un robot musical}
19              \label{robot1}
20          \end{flushright}
21      \end{figure}
22
23
24      \blindtext[10]
25  %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```latex
25  %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
26      \begin{figure}[t]
27          \centering
28          \includegraphics[width=6.0cm]{robot1.jpg}
29          \includegraphics[width=6.0cm]{robot2.jpeg}
30          \caption{A robot1 y robot 2.}
31          \label{robots pegados}
32      \end{figure}
33
34  \blindtext[10]
35  %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
36      \begin{figure}[b]
37          \begin{minipage}[c]{.6\linewidth}
38              \centering
39              \includegraphics[width=6.0cm]{robot4.jpg}
40              \caption{A girl.}
41              \label{girl}
42          \end{minipage}\hfill
43  %
44          \begin{minipage}[c]{.6\linewidth}
45              \centering
46              \includegraphics[width=6cm]{robot2.jpeg}
47              \caption{A flower.}
48              \label{flower}
49          \end{minipage}
50
51      \end{figure}
52  %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
53  \blindtext[10]
54  \end{document}
```

61

LATEX EJEMPLOS CON FIGURAS

July 1, 2024

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Figure 1: Un robot musical

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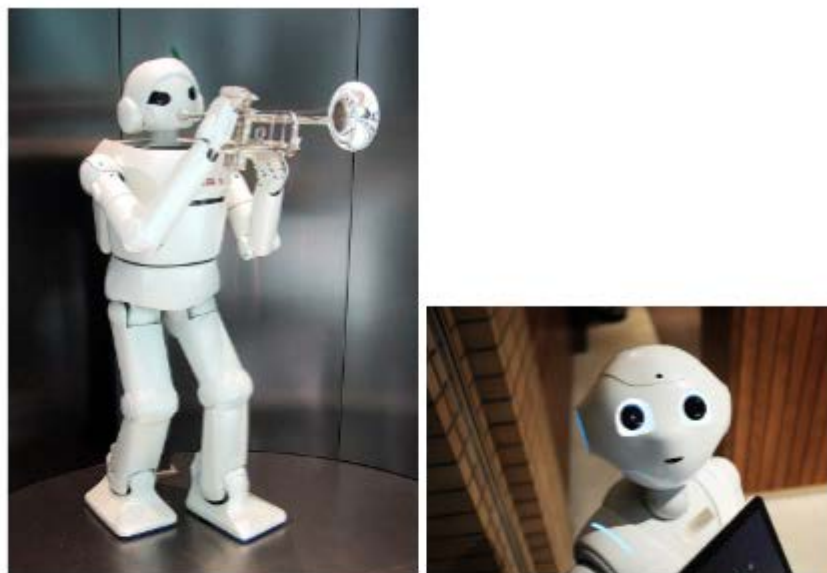
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Figure 2: A robot1 y robot 2.

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Figure 3: A girl.

Figure 4: A flower.

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