

LATEX WORKSHOP

The Gate for Professional Documents

Prepared by the Artificial Intelligence Research Center (AIRC), Ajman
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Outlines

01 Introduction

02 Share and Download

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What is L^AT_EX ?

- Pronounced as LAY-tek or LAH-tek.
- It is based on the WYSIWYM (what you see is what you mean) idea.

Why to Use L^AT_EX ?

- Create scientific professional-looking documents.
- Separates the content from the style.
- Open-Source packages & templates Ready to use
- Typeset complex mathematical formulas

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“

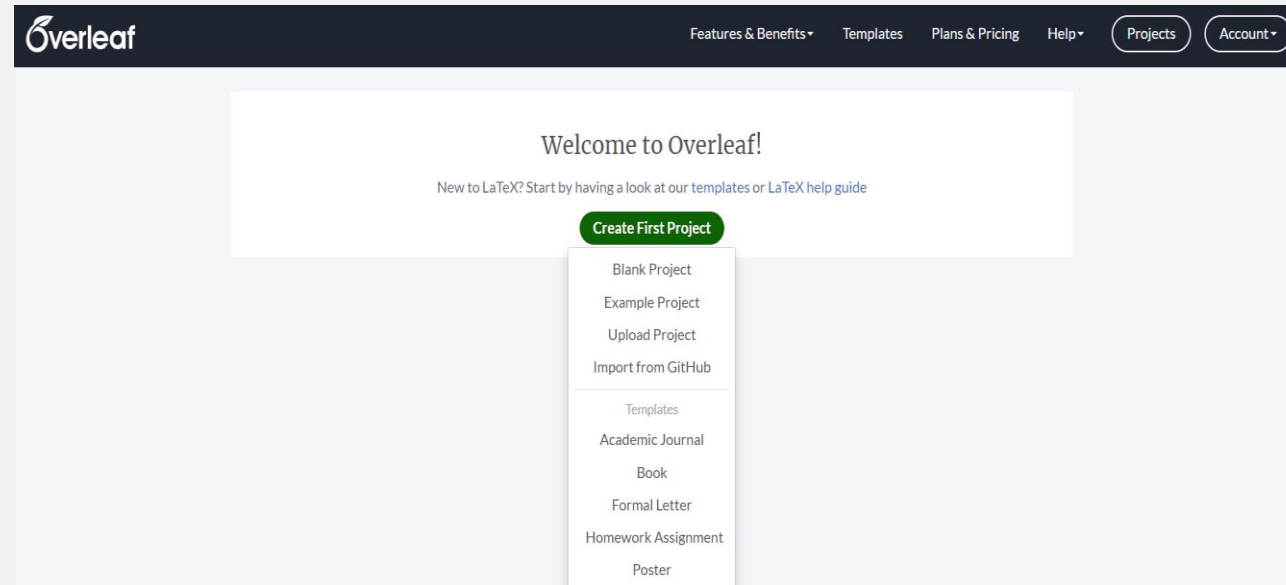
Collaborative cloud-based Latex editor used for writing, editing and publishing scientific documents

”

<https://www.overleaf.com>

Create Account in Overleaf

1. Go to “<https://www.overleaf.com>”.
2. Register using your preferred email and password.
3. Now you are ready to start your first document.



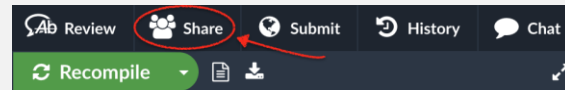
Create Your First Project

1. Click on “**Create First Project**” Button.
2. Choose the project type “**Academic Journal**”.
3. Scroll down to the “Related tags” and choose “**Elsevier**”.
4. Choose the template name “**Elsevier Article (elsarticle) Template**”.
5. Click on “**Open as template**” Button.

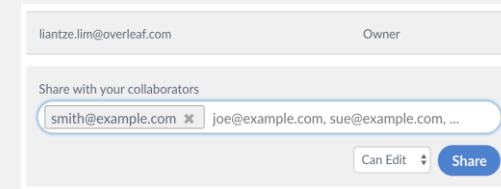
Share & Download

Link Sharing & Collaboration

1

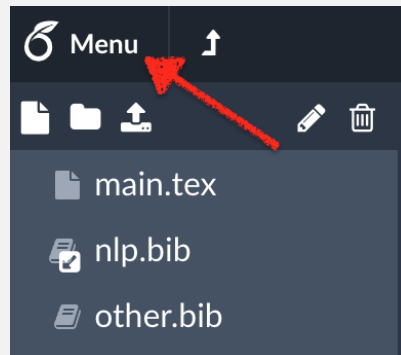


2

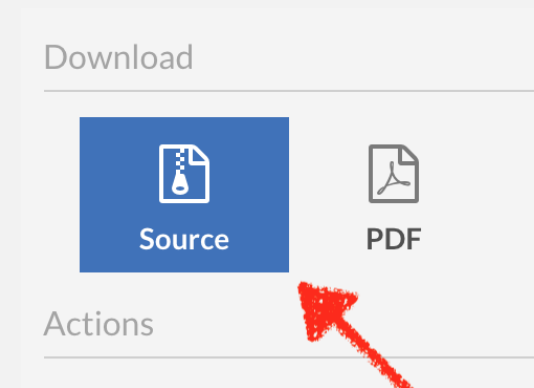


Download files

1



2



Exercise 1

1. Create new account.
2. Create new project using “**Elsevier Article (elsarticle) Template**”.
3. Name your project as “**WorkShop_YourName**”.
4. Share the document with us.

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Basic Components of Overleaf UI

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Files and Folders

- cas-refs.bib
- elsarticle-harv.bst
- elsarticle-num-names...
- elsarticle-num.bst
- elsarticle-template-ha...
- elsarticle-template-nu...
- elsarticle-templa... (selected)
- elsarticle.cls
- grabs.pdf

Text Editor Area

```

5  %%
6  %%
7  %% It may be distributed under the conditions of the LaTeX Project Public
8  %% License, either version 1.2 of this license or (at your option) any
9  %% later version. The latest version of this license is in
10 %% http://www.latex-project.org/lppl.txt
11 %% and version 1.2 or later is part of all distributions of LaTeX
12 %% version 1999/12/01 or later.
13 %%
14 %% The list of all files belonging to the 'Elsarticle Bundle' is
15 %% given in the file 'manifest.txt'.
16 %%
17 %%
18 %% Template article for Elsevier's document class 'elsarticle'
19 %% with numbered style bibliographic references
20 %% SP 2008/03/01
21 %%
22 %%
23 %%
24 %% $Id: elsarticle-template-num.tex 190 2020-11-23 11:12:32Z rishi $
25 %%
26 %%
27 \documentclass[preprint,12pt]{elsarticle}
28
29 %% Use the option review to obtain double line spacing
30 %% \documentclass[authoryear,preprint,review,12pt]{elsarticle}
31
32 %% Use the options 1p,twocolumn; 3p; 3p,twocolumn; 5p; or 5p,twocolumn
33 %% for a journal layout:
34 %% \documentclass[final,1p,times]{elsarticle}
35 %% \documentclass[final,1p,times,twocolumn]{elsarticle}
36 %% \documentclass[final,3p,times]{elsarticle}
37 %% \documentclass[final,3p,times,twocolumn]{elsarticle}
38 %% \documentclass[final,5p,times]{elsarticle}
39 %% \documentclass[final,5p,times,twocolumn]{elsarticle}

```

Compiled Text

Title of Your Manuscript

Author One^a, Author Two^b, Author Three^{a,b}

^aDepartment One, Address One, City One, 00000, State One, Country One
^bDepartment Two, Address Two, City Two, 22222, State Two, Country Two

Abstract

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Keywords: keyword one, keyword two
PACS: 0000, 1111
2000 MSC: 0000, 1111

1. Sample Section Title

Lorem ipsum dolor sit amet, consectetur adipiscing [1] elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum. See appendix Appendix A.

Preprint submitted to Nuclear Physics B January 19, 2022

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Document Structure

1 Preamble

2 Front Matter

- Title
- Authors & Affiliation
- Abstract
- Table of Content
- List of Figures & Tables

3 Main Body

4 End Matter

- Bibliography
- Appendix

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Preamble

The part of your .tex file before "`\begin{document}` command" is called the preamble.

- Document Class

```
\documentclass[preprint,12pt]{elsarticle}
```

- Load Extra Packages

```
\usepackage{xcolor}
```

Basic and essential packages

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Package	Package Usage
<code>\usepackage{amssymb}</code>	Provides various useful mathematical symbols
<code>\usepackage{amsmath}</code>	Provides commands to typeset matrices with different delimiters
<code>\usepackage{xcolor}</code>	Provides commands to style the text with colors
<code>\usepackage[colorlinks,urlcolor=blue]{hyperref}</code>	Use user defined hyperlinks with url colored blue
<code>\usepackage{graphicx}</code>	Manage figures and manipulate its attributes
<code>\usepackage{caption,subcaption}</code>	For the subfigure captioning
<code>\usepackage{adjustbox}</code>	Adjust the floating objects
<code>\usepackage{array}</code>	Extends the options for column formats and provides “programmable” format specifications.

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Front Matter

- Starts with the `\begin{frontmatter}` and ends `\end{frontmatter}`
- Consists of the following elements
 1. Title
 2. Authors & Affiliation
 3. Abstract
 4. Keywords
 5. Table of Content
 6. List of Figures
 7. List of Tables

Paper's Title

```
\title{The paper title}
```

Author name

```
\author[Aff1]{Author name}
```

Affiliations

```
\affiliation [Aff1]{program={Master of AI},collage={College of  
Engineering and Information Technology},  
University={Ajman University},city={Ajman},  
country={United Arab Emirates},  
\email{SI1D@ajmanuni.ac.ae}}
```

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Main Body

Document Sectioning

```
\section{Section}
```

```
\subsection{Subsection}
```

```
\subsubsections{Subsubsection}
```

1. section

1.1. subsection

1.1.1. subsubsection

End Matter

1 Appendix

```
\appendix
```

2 Bibliography

bibliographic style

```
\bibliographystyle{elsarticle-num-names}
```

Import the .bib file

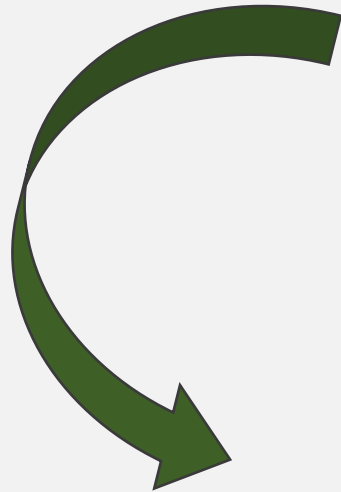
```
\bibliography{Reference}
```

BibTeX Format

```
@Entry_type{citekey,  
    Field1 = "Fieldvalue",  
    .  
    .  
}
```


End Matter

```
@ARTICLE{Paper1,  
  author  = {Fortunato, S.},  
  title   = {Community detection  
in graphs},  
  journal = {Phys. Rep.-Rev. Sec.  
Phys. Lett.},  
  volume  = {486},  
  year    = {2010},  
  pages   = {75-174}  
}
```



[1] S. Fortunato, Community detection in graphs, Phys. Rep.-Rev. Sec. Phys.Lett. 486 (2010) 75–174.

Exercise 2

1. Edit the paper title to “**LATEX Workshop**”
2. Write your name as the author of the paper.
3. Edit the affiliation to match yours.
4. Create the Abstract, Introduction and conclusion text files.
5. Import the text files to the main using `\input{FileName}`

Text Manipulation

Font Style

Bold : `\textbf{enter text here}`

Italic: `\textit{enter text here}`

Size : `\small{small} enter text here` or
`{\small enter text here}`

Color: `\textcolor{color name}{enter text here}`

Highlight: `\colorbox{color name}{enter text here}`

Link : `\href{URL link}{Link}`

url: `\url{http://www.overleaf.com}`

Make sure to import package :

- `\usepackage{xcolor}`
- `\usepackage[colorlinks,urlcolor=blue]{hyperref}`

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Text Manipulation

Footnote

```
\footnote{enter text here}
```

Unordered List

```
\begin{itemize}
  \item List entry one
\end{itemize}
```

Ordered List

```
\begin{enumerate}
  \item List entry one
\end{enumerate}
```

Text Manipulation

Comments

`%this is a comment, it is visible in editor window`



Special Characters

Special Characters	Symbol	Latex
Hashtag Sign	#	<code>\#</code>
Dollar Sign	\$	<code>\\$</code>
Percent Sign	%	<code>\%</code>
Underscore	_	<code>_</code>
Ampersand	&	<code>\&</code>
Braces	{ }	<code>\{ \}</code>
Circumflex	^	<code>\^{} </code>
Backslash	\	<code>\textbackslash</code>

Paragraph Manipulation

1 Center

```
\begin{center}
    %% text to be centered
\end{center}
```

2 Right Alignment

```
\begin{flushright}
    %paragraph to be right aligned
\end{flushright}
```

To use `\justifying` make sure to import package :

- `\usepackage{ragged2e}`

3 Justify

```
\justifying
%paragraph to be justified
```

4 Left Alignment

```
\begin{flushleft}
    %paragraph to be left aligned
\end{flushleft}
```

Exercise 3

1. Create the following Ordered List :

1. Lorem ipsum dolor sit amet, consectetur
2. Lorem & ipsum dolorsit amet, consectetur

2. Create the following sentence :

Lorem ipsum dolor sit amet, consectetur Lorem ipsum dolor sit amet, consectetur
 Lorem ipsum huge consectetur

Make sure to import package :

- `\usepackage{xcolor}`
- `\usepackage[colorlinks,urlcolor=blue]{hyperref}`

Mathematical expressions

1 Inline math mode

- `$x+1=5$`
- `\(x+1=5\)`
- `\begin{math}x+1=5\end{math}`

Try to write mathematical expression inline using the dollar sign $X + 1 = 5$, Try to write mathematical expression inline using brackets $X + 1 = 5$, to write mathematical expression inline using math environment $X + 1 = 5$.

Mathematical expressions

2 Display math mode

- `\ [x+1=5 \]`
- `\begin{displaymath} x+1=5 \end{displaymath}`
- `\begin{equation} x+1=5 \end{equation}`

Try to write mathematical expression in display mode using square brackets

$$x + 1 = 5$$

, Try to write mathematical expression in display mode using displaymath environment

$$x + 1 = 5$$

, Try to write mathematical expression in display mode using equation environment

$$x + 1 = 5 \tag{1}$$

Symbols & Operators

Make sure to import
`\usepackage{amssymb}` package

Special Characters	Symbol	Latex
Alpha	α	<code>\alpha</code>
Beta	β	<code>\beta</code>
Gamma	γ	<code>\gamma</code>
Theta	θ	<code>\theta</code>
Delta	δ	<code>\delta</code>
Epsilon	ε	<code>\varepsilon</code>
Pi	π	<code>\pi</code>
Infinity	∞	<code>\infty</code>

Special Characters	Symbol	Latex
Less than or equal	\leq	<code>\leq</code>
Greater than or equal	\geq	<code>\geq</code>
Less than	$<$	<code><</code>
Greater than	$>$	<code>></code>
Not equal	\neq	<code>\neq</code>
Plus minus	\pm	<code>\pm</code>

<https://www.caam.rice.edu/~heinken/latex/symbols.pdf>

https://oeis.org/wiki/List_of_LaTeX_mathematical_symbols

Subscript and Superscript

1 Subscript

- Latex: $\$x_i\$$
- Output : x_i

2 Superscript

- Latex : $\$x^i\$$
- Output : x^i

3 Subscript and superscript

- Latex : $\$x^j_i\$$ or $\$x_i^j\$$
- Output : x_i^j

4 Long subscripts and superscripts

- Latex : $\$x^{\{jk\}}_{\{iz\}}\$$
- Output : x_{iz}^{jk}

Matrices

Make sure to import
`\usepackage{amsmath}` package

1 Round brackets Matrix

- Latex :

```
$\begin{pmatrix}  
1 & 2 & 3 \\  
a & b & c  
\end{pmatrix}$
```

- Output :

$$\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix}$$

2 Square brackets Matrix

- Latex :

```
$\begin{bmatrix}  
1 & 2 & 3 \\  
a & b & c  
\end{bmatrix}$
```

- Output :

$$\begin{bmatrix} 1 & 2 & 3 \\ a & b & c \end{bmatrix}$$

Matrices

- 1 Matrix with horizontal dots `\dots`
- 2 Matrix with vertical dots `\vdots`
- 3 Matrix with diagonal dots `\ddots`

- Latex :

```
$\begin{bmatrix}
  a_{1,1} & \dots & a_{1,n} \\
  \vdots & \ddots & \vdots \\
  a_{n,1} & \dots & a_{n,n}
\end{bmatrix}$
```

- Output :

$$\begin{bmatrix} a_{1,1} & \cdots & a_{1,n} \\ \vdots & \ddots & \vdots \\ a_{n,1} & \cdots & a_{n,n} \end{bmatrix}$$

Exercise 4

1. Create the following matrix using both Inline and display math mode

$$\begin{pmatrix} x_1^1 & \cdots & x_1^{nVar} \\ \vdots & \ddots & \vdots \\ x_{nPop}^1 & \cdots & x_{nPop}^{nVar} \end{pmatrix}$$

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Commonly used functions

Remember : to add \$\$ or \[] or ... to be able to display the functions

Function	Latex	Output
Division	<code>\frac{x}{y}</code>	$\frac{x}{y}$
Summation	<code>\sum_{i=1}^n x_i</code>	$\sum_{i=1}^n x_i$
Product	<code>\prod_{i=1}^n x_i</code>	$\prod_{i=1}^n x_i$
limit	<code>\lim_{x \to \infty} f(x)</code>	$\lim_{x \rightarrow \infty} f(x)$
Integral	<code>\int_a^b x \, dx</code>	$\int_a^b x \, dx$
roots	<code>\sqrt[n]{x}</code>	$\sqrt[n]{x}$

Brackets (types , sizes)

To insert the parentheses or brackets, the `\left` and `\right` commands are used. Even if you are using only one bracket, both commands are mandatory. `\left` and `\right` can dynamically adjust the size

Type	Symbol	Latex
Parentheses; round brackets	$(x + 1)$	$(x + 1)$
Brackets; square brackets	$[x + 1]$	$[x + 1]$
Pipes; vertical bars	$ x + 1 $	$\$ x + 1 \$$
Braces; curly brackets	$\{x + 1\}$	$\{x + 1\}$

Brackets (types , sizes)

To insert the parentheses or brackets, the `\left` and `\right` commands are used. Even if you are using only one bracket, both commands are mandatory. `\left` and `\right` can dynamically adjust the size

Case1 :

`\left[\frac{ N }{ (\frac{L}{p}) - (m+n) } \right]`

$$\left[\frac{N}{\left(\frac{L}{p}\right) - (m+n)} \right]$$

Case2 :

`[\frac{ N }{ (\frac{L}{p}) - (m+n) }]`

$$\left[\frac{N}{\left(\frac{L}{p}\right) - (m+n)} \right]$$

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Piecewise Function

Remember : to add \$\$
or \[\] or ... to be able
to display the functions

$$f(x) = \begin{cases} -x, & x < 0 \\ x, & x \geq 0 \end{cases}$$



f (x) =

```
\begin{cases}
```

```
- x, & x < 0
```

```
x, & x \geq 0
```

```
\end{cases}
```

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Online Mathematics Editor

<https://www.mathcha.io/>

Exercise 5

<https://www.caam.rice.edu/~heinken/latex/symbols.pdf>

1. Write the following piecewise function in display math mode

$$f(x) = \begin{cases} x + 2 & \text{if } x > 1 \\ 2 & \text{if } -1 \leq x \leq 1 \\ x - 1 & \text{if } -3 < x < -1 \end{cases}$$

2. Write the following equation in inline math mode

$$f(x) = \left(\frac{\sum_{j=1}^n X^j}{n} \right)$$

Basic Figures Statement

Basic Statement consists of

1 Import statement

```
\includegraphics{path to  
image}
```

2 Caption

```
\caption{insert caption  
here}
```

Make sure to import
`\usepackage{graphicx}` package

3 Referencing

```
\label{fig:figure  
label}
```

Basic Figures Statement

4 Positioning

```
\begin{figure}[position]
  \centering
  \includegraphics{image path}
  \caption{image caption}
  \label{label}
\end{figure}
```

To use positioning parameter as H
use: `\usepackage{float}`

Parameter	Position
h	Place the float approximately at the location in the L ^A T _E X code.
t	Position at the top of the page.
b	Position at the bottom of the page.
p	Put on a special page for floats only.
!	Override internal parameters LaTeX uses for determining "good" float positions.
H	Places the float at precisely the location in the L ^A T _E X code.

Basic Figures Statement

5 Resizing

- Using **Scale**:

```
\includegraphics[scale=1.5]{path to image}
```

- Using **Width** and **Height** Attributes

```
\includegraphics[width=5cm, height=4cm]{path to image}
```

6 Rotating

```
\includegraphics[angle=45]{path to image}
```

Latex Units & Length

Abbreviation	Definition
pt	A point (default length unit). Is 0.2515 mm
cm	a centimeter
mm	a millimeter
in	an inch
ex	The height of an x in the current font
em	The width of an m in the current font
<code>\linewidth</code>	width of the line in the current environment
<code>\columnwidth</code>	width of the column
<code>\textwidth</code>	width of the text
<code>\textheight</code>	height of the text

Basic Figure Statement

```
\begin{figure}[b]
  \centering
  \includegraphics[width=\linewidth, height=8cm]{04_Figures/figures_folder/AjmanUniversity.jpg}
  \caption{The Ajman University Main Campus}
  \label{fig:au_campus}
\end{figure}
```



Figure 1: The Ajman University Main Campus

Subfigures

Use the **Subfigure** environments inside of a **figure** environment to add multiple images

```
\begin{figure}
  \centering
  \begin{subfigure}[b]{0.3\textwidth}
    % figure 1 attributes
  \end{subfigure}
  \hfill
  \begin{subfigure}[b]{0.3\textwidth}
    % figure 2 attributes
  \end{subfigure}
  \hfill
  \begin{subfigure}[b]{0.3\textwidth}
    % figure 3 attributes
  \end{subfigure}
  \caption{Three simple graphs}
  \label{fig:three graphs}
\end{figure}
```

Make sure to import
`\usepackage{caption}`
`\usepackage{subcaption}`

Exercise 6

1. Import an image from the web to the project
2. Caption the figure as "**The flowchart figure is from exercise 6 of the latex workshop**"
3. Label the figure as "**fig:flowchart**"
4. Resize it to be fit the width of the paper
5. Position it center and at the top of the page

Make sure to import
`\usepackage{graphicx}`
package

Basic Table

```

\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|}
ID & Name & College \\
202211123 & Noor & Information Technology \\
202210457 & Abeer & Pharmacy \\
202111444 & Leen & Architecture \\
\end{tabular}
\caption{Employee Information}
\label{tab:E_Info}
\end{table}

```

Parameter
h
t
b
p
!
H

ID	Name	College
202211123	Noor	Information Technology
202210457	Abeer	Pharmacy
202111444	Leen	Architecture

Table 1: Employee Information

Horizontal Line

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```

\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|}
\hline
ID & Name & College \\
\hline
202211123 & Noor & Information Technology \\
202210457 & Abcer & Pharmacy \\
202111444 & Leen & Architecture \\
\hline
\end{tabular}
\caption{Employee Information}
\label{tab:E_hline}
\end{table}

```

ID	Name	College
202211123	Noor	Information Technology
202210457	Abcer	Pharmacy
202111444	Leen	Architecture

Table 2: Employee Information

Multicolumn

```
\multicolumn{number cols}{align}{text} % align l,c,r
```

```
\begin{table}[h]
\centering
\begin{tabular}{|l|c|r|}
\hline
ID & Name & College \\
\hline
202211123 & Noor & Information Technology \\
\hline
202210457 & Abeer & Pharmacy \\
\hline
\multicolumn{2}{|c|}{multi-column} & Architecture \\
\hline
\end{tabular}
\caption{Employee Information}
\label{tab:E_MultiC}
\end{table}
```

ID	Name	College
202211123	Noor	Information Technology
202210457	Abeer	Pharmacy
multi-column		Architecture

Table 3: Employee Information

Multirow

```
\multirow{number rows}{width}{text}
```

```
\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|}
\hline
ID & Name & College \\
\hline
\multirow{2}{*}{202211123} & \multirow{2}{*}{Noor} & Information Technology \\
\cline{3-3}
& & Engineering \\
\hline
202210457 & Abeer & Pharmacy \\
\hline
202111444 & Leen & Architecture \\
\hline
\end{tabular}
\caption{Employee Information}
\label{tab:E_MultiR}
\end{table}
```

Make sure to import
`\usepackage{multirow}` package

ID	Name	College
202211123	Noor	Information Technology
		Engineering
202210457	Abeer	Pharmacy
202111444	Leen	Architecture

Table 4: Employee Information

Set the column width

https://www.overleaf.com/learn/latex/Lengths_in_LaTeX

```

\begin{table}[h]
\centering
\begin{tabular}{l|c|m{3cm}}
\hline
ID & Name & College \\
\hline
202211123 & Noor & Information Technology \\
202210457 & Abeer & Pharmacy \\
202111444 & Leen & Architecture \\
\hline
\end{tabular}
\caption{Employee Information}
\label{tab:E_W}
\end{table}

```

Make sure to import
`\usepackage{array}` package

ID	Name	College
202211123	Noor	Information Technology
202210457	Abeer	Pharmacy
202111444	Leen	Architecture

Table 5: Employee Information

Adjust the table width to the pages' text width

```

\begin{table}[h]
\centering
\begin{adjustbox}{width=\textwidth}
\begin{tabular}{l|c|r}
\hline
ID & Name & College \\
\hline
202211123 & Noor & Information Technology \\
202210457 & Abeer & Pharmacy \\
202111444 & Leen & Architecture \\
\hline\end{tabular}
\end{adjustbox}
\caption{Adjustable width table}
\label{tab:E_Adj}
\end{table}

```

Make sure to import
`\usepackage{adjustbox}` package

This to text was written just to visualize the text width and accordingly the table width, This to text was written just to visualize the text width and accordingly the table width.

ID	Name	College
202211123	Noor	Information Technology
202210457	Abeer	Pharmacy
202111444	Leen	Architecture

Table 6: Adjustable width table

Table rotation

```

\begin{lanscape}
  \begin{table}[h]
    \centering
    \caption{Employee Information}
    \label{tab:E_Rot2}
    \begin{tabular}{l|c|r}
      \hline
      ID & Name & College \\
      \hline
      202211123 & Noor & Information Technology \\
      202210457 & Abeer & Pharmacy \\
      202111444 & Leen & Architecture \\
      \hline
    \end{tabular}
  \end{table}
\end{lanscape}

```

Make sure to import
`\usepackage{lscap}` package

Table 8: Employee Information

ID	Name	College
202211123	Noor	Information Technology
202210457	Abeer	Pharmacy
202111444	Leen	Architecture

Exercise 7

1. Generate the Following table
2. Set the table width to 70% of the text width:

Make sure to import package :

- `\usepackage{adjustbox}`
- `\usepackage{multirow}`

Table 14: Exercise 7

Multirow cell	Cell2	Cell3
	Cell2	Cell3
Cell1	multicolumn	

Table Style

```

\begin{table}[h]
\centering
\caption{Employee Information}
\label{tab:E_cellC}
\begin{tabular}{l|c|r}
\hline
\cellcolor{red!50} ID & Name & College \\
\hline
202211123 & Noor & Information Technology \\
202210457 & Abeer & Pharmacy \\
202111444 & Leen & Architecture \\
\hline
\end{tabular}
\end{table}

```

Make sure to import
`\usepackage[table]{xcolor}` package



Table 10: Employee Information

ID	Name	College
202211123	Noor	Information Technology
202210457	Abeer	Pharmacy
202111444	Leen	Architecture

Table Style

```

\begin{table}[h]
\centering
\caption{Employee Information}
\label{tab:E_rowC}
\begin{tabular}{l|c|r}
\hline
\rowcolor{red} ID & Name & College \\
\hline
202211123 & Noor & Information Technology \\
202210457 & Abeer & Pharmacy \\
202111444 & Leen & Architecture \\
\hline
\end{tabular}
\end{table}

```

Table 11: Employee Information

ID	Name	College
202211123	Noor	Information Technology
202210457	Abeer	Pharmacy
202111444	Leen	Architecture

Table Style

```

\begin{table}[h]
\centering
\caption{Employee Information}
\label{tab:E_hline}
\rowcolors{1}{red!30}{red!50}
\begin{tabular}{l|c|r}
\hline
ID & Name & College \\
\hline
202211123 & Noor & Information Technology \\
202210457 & Abeer & Pharmacy \\
202111444 & Leen & Architecture \\
\hline
\end{tabular}
\end{table}

```

Table 12: Employee Information

ID	Name	College
202211123	Noor	Information Technology
202210457	Abeer	Pharmacy
202111444	Leen	Architecture

Table Style

```

\begin{table}[h]
\centering
\caption{Employee Information}
\label{tab:E_ColC}
\begin{tabular}{>\columncolor{red}l|c|r}
\hline
ID & Name & College \\
\hline
202211123 & Noor & Information Technology \\
202210457 & Abeer & Pharmacy \\
202111444 & Leen & Architecture \\
\hline
\end{tabular}
\end{table}

```

Table 13: Employee Information

ID	Name	College
202211123	Noor	Information Technology
202210457	Abeer	Pharmacy
202111444	Leen	Architecture

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Online Table generator

<https://www.tablesgenerator.com/>

From Excel to Latex

1. Download Excel2Latex add-in from <https://ctan.org/tex-archive/support/excel2latex?lang=en> or <https://softfamous.com/postdownload-file/excel2latex/6510/2212/>
2. Add the Add-in to Microsoft Excel.
3. Create a table.
4. Export the table in latex format.
5. Add `\usepackage{booktabs}` to the latex document.

Exercise 8

Make sure to import
`\usepackage[table]{xcolor}package`

1. Generate the Following table:

- Use 30 % of the red color for the odd rows (starting from the 3rd row)
- Use 20% of the blue color for the even rows (starting from the 2nd row)
- Use 40% of the gray color for the 2nd cell in the first-row

Table 16: Exercise 8

Row1 Cell1	Row1 Cell2	Row1 Cell3
Row2 Cell1	Row2 Cell2	Row2 Cell3
Row3 Cell1	Row3 Cell2	Row3 Cell3

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

Pseudo code Algorithms

```
\begin{algorithm}
\caption{Algorithm with caption}
\label{alg:generic}
\begin{algorithmic}
  \State  $i$  gets 10
  \While { $i > 10$ }
    \State statement
    \If {condition}
      \State statement
    \Else
      \State statement
    \EndIf
  \EndWhile
\end{algorithmic}
\end{algorithm}
```

Algorithm 1 An algorithm with caption

```
 $i \leftarrow 10$ 
while  $i > 10$  do
  statement
  if condition then
    statement
  else
    statement
  end if
end while
```

Make sure to import package :

- `\usepackage{algorithm}`
- `\usepackage{algpseudocode}`

If else statement

```
\begin{algorithm}  
\caption{Algorithm with caption}  
\label{alg:IfElse}  
\begin{algorithmic}[1]  
  \If {condition}  
    \State statement  
  \Else  
    \State statement  
  \EndIf  
\end{algorithmic}  
\end{algorithm}
```

Algorithm 2 An algorithm with caption

- 1: **if** condition **then**
 - 2: statement
 - 3: **else**
 - 4: statement
 - 5: **end if**
-

While Loop

```
\begin{algorithm}
\caption{Algorithm with caption}
\label{alg:While}
\begin{algorithmic}[1]
  \While {$ i > 10 $}
    \State statement1
    \State statement2
  \EndWhile
\end{algorithmic}
\end{algorithm}
```

Algorithm 3 An algorithm with caption

```
1: while  $i > 10$  do
2:   statement 1
3:   statement 2
4: end while
```

For Loop

```
\begin{algorithm}  
\caption{Algorithm with caption}  
\label{alg:For}  
\begin{algorithmic}[1]  
  \For{variable from 1 to n}  
    \State statement1  
    \State statement2  
  \EndFor  
\end{algorithmic}  
\end{algorithm}
```

Algorithm 4 An algorithm with caption

- 1: **for** variable from 1 to n **do**
 - 2: Statement1
 - 3: Statement2
 - 4: **end for**
-

Exercise 9

1. Write the following Algorithm using Latex:

Algorithm 5 An algorithm of exercise 9 of the Latex workshop

```
1:  $X \leftarrow 1$ 
2:  $Y \leftarrow y$ 
3:  $Z \leftarrow n$ 
4: while  $Z \neq 0$  do
5:   if  $Z$  is even then
6:      $Y \leftarrow Y \times Y$ 
7:      $Z \leftarrow \frac{Z}{2}$ 
8:   else if  $Z$  is odd then
9:      $X \leftarrow X \times Y$ 
10:     $Z \leftarrow Z - 1$ 
11:   end if
12: end while
```

Symbol	Command
\leftarrow	<code>\gets</code>
\neq	<code>\neq</code>
\times	<code>\times</code>

Make sure to import package :

- `\usepackage{algorithm}`
- `\usepackage{algpseudocode}`

Chemical Formulae

1 The chemical Formulae Package

Load the Chemical formulae package using the command

```
\usepackage[version=4]{mhchem}
```

2 Basic Syntax

```
\ce{ The Chemical Formula }
```


Reaction Arrows

1 To the right

- Output :



- Latex :

```
\ce{ A -> B }
```

2 Double Ended

- Output :



- Latex :

```
\ce{ A <- -> B }
```

3 Reversible

- Output :



- Latex :

```
\ce{ A <=> B }
```

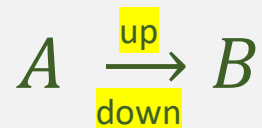
Reaction Arrows – Text Above/below

1 Basic Syntax

```
\ce{A ->[Text Above][Text Below] B}
```

2 Example

- Output :



- Latex :

```
\ce{A ->[up][down] B}
```

Precipitate and Gas

1 Precipitate

- Output :



- Latex :

```
\ce{A -> B \downarrow}
```

2 Gas

- Output :



- Latex :

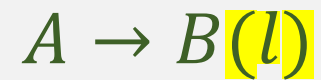
```
\ce{A -> B \uparrow}
```

The physical state of matter

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1 Liquid

- Output :



- Latex :

```
\ce{A -> B(l)}
```

2 Aqueous

- Output :



- Latex :

```
\ce{A(aq) -> B}
```

3 Gas

- Output :



- Latex :

```
\ce{A(g) -> B}
```

Subscript, charge and Coefficient (1 of 2)

1 Subscript

- Output : A_2
- Latex: `\ce{A2}`

2 Subscript for a Compound

- Output : $(AB)_2$
- Latex: `\ce{(AB)2}`

1 Charge (Case 1)

- Output : A^-
- Latex: `\ce{A-}`

2 Charge (Case 2)

- Output : A^{2-}
- Latex: `\ce{A^2-}`

3 Charge for a Compound

- Output : $[AB]^{2-}$
- Latex: `\ce{[AB]^2-}`

Subscript, charge and Coefficient (2 of 2)

1 Subscript and charge

- Output : A_3^{2-}
- Latex: `\ce{A3^2-}`

2 Coefficient

- Output : $2A_3^{2-}$
- Latex: `\ce{2A3^2-}`

Chemical Formula

1 The Expected Output

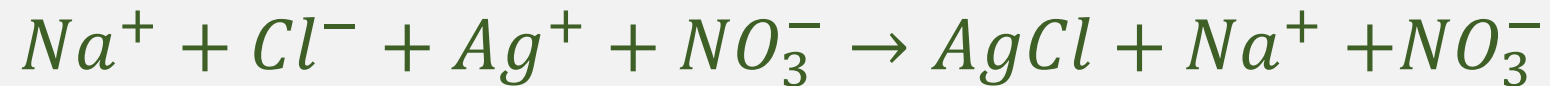
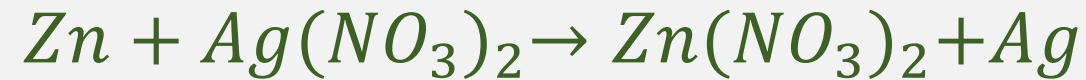


2 Latex

```
\ce{2H2(g) + O2(g) -> 2H2O(l) }
```

Exercise 10

1. Write the following Chemical Formulae:



Make sure to import package
`\usepackage[version=4]{mhchem}`

References

1 Cross-referencing

1. Refer to document section, image, table, equation, etc.

```
\ref{label_name}
```

2 Citation

1. Reference others work.
2. Can be exported from (BibTeX)
 1. google scholar
 2. Journal website
 3. Conference website

```
\cite{cite_name}
```

Presentations

1. Different templets are available for direct use
2. Uses beamer class

```
\documentclass{beamer}
```

Presentation Outline slide

```
\begin{frame}
```

```
\frametitle{Outline}
```

```
\tableofcontents
```

```
\end{frame}
```