

Introduction to \LaTeX

Dr. Wan Nor Arifin

Biostatistics and Research Methodology Unit
Universiti Sains Malaysia

`wnarifin@usm.my` | `wnarifin@github.io`



23 July, 2023

- 1 Introduction
- 2 Structure
- 3 Adding content

What is \LaTeX ?

- \LaTeX "is a software system for document preparation"¹
- Uses markup tags "`\tag{content}`" to format
- Suitable for academics, esp. mathematics and computer science – technical journals often provide \LaTeX templates
- Suitable for **thesis** writing (i.e. no headache about the thesis format later on)
- **Standard** format for everyone using the same document class – no need to adjust anything

¹<https://en.wikipedia.org/wiki/LaTeX>

General:

- <https://en.wikibooks.org/wiki/LaTeX>
- <https://www.overleaf.com/learn>

Math:

- https://oeis.org/wiki/List_of_LaTeX_mathematical_symbols
- https://en.wikipedia.org/wiki/Help:Displaying_a_formula#Formatting_using_TeX

Algorithm:

- <https://www.overleaf.com/learn/latex/Algorithms>

USM thesis format:

- <https://github.com/wnarifin/usmthesis>

Desktop:

- \TeX maker <http://www.xmlmath.net/texmaker/>
- \TeX studio <https://www.texstudio.org/>
- \TeX works <https://www.tug.org/texworks/>

Online:

- Overleaf <https://www.overleaf.com/>

Structure

\LaTeX

```
\documentclass{...}  
...  
\begin{document}  
...  
\end{document}
```

HTML

```
<html>  
  <head>  
    ...  
  </head>  
  <body>  
    ...  
  </body>  
</html>
```

Preamble

```
\documentclass[options]{class}  
\usepackage[options]{package}
```

```
\documentclass[11pt,a4paper]{article}  
\usepackage{tabularx}
```

Preamble

```
\documentclass[options]{class}  
\usepackage[options]{package}  
\title{...}  
\author{...}  
\date{...}
```

```
\documentclass[11pt,a4paper]{article}  
\title{\LaTeX{} workshop}  
\author{Arifin}  
\date{July 23, 2023}
```


Preamble + Document

```
\documentclass[options]{class}  
\usepackage[options]{package}  
\title{...}  
\author{...}  
\date{...}  
\begin{document}  
\maketitle  
...content...  
\end{document}
```

Preamble + Document

Let's copy + paste in \LaTeX editor and compile

```
\documentclass[11pt,a4paper]{article}
\title{\LaTeX{} workshop}
\author{Arifin}
\date{July 23, 2023}
\begin{document}
\maketitle
...content...
\end{document}
```

Adding text

Let's copy + paste in \LaTeX editor and compile

```
\documentclass[11pt,a4paper]{article}
\usepackage{tabularx}
\title{\LaTeX{} workshop}
\author{Arifin}
\date{July 23, 2023}
\begin{document}
\maketitle
```

In the world of document preparation and typesetting, LaTeX stands as a timeless masterpiece, revered for its elegance, precision, and unmatched capabilities. Developed by Leslie Lamport in the early 1980s, this remarkable typesetting system has consistently proven itself as the go-to choice for scholars, researchers, professionals, and creative minds alike.

```
\end{document}
```

Adding section

Let's copy + paste in \LaTeX editor and compile

```
\documentclass[11pt,a4paper]{article}
\title{\LaTeX{} workshop}
\author{Arifin}
\date{July 23, 2023}
\begin{document}
\maketitle
\section{First}
```

In the world of document preparation and typesetting, LaTeX stands as a timeless masterpiece, revered for its elegance, precision, and unmatched capabilities.

```
\subsection{Sub-First}
```

Developed by Leslie Lamport in the early 1980s, this remarkable typesetting system has consistently proven itself as the go-to choice for scholars, researchers, professionals, and creative minds alike.

```
\end{document}
```

Adding bullet/number

Let's copy + paste in \LaTeX editor and compile

```
\documentclass[11pt,a4paper]{article}
\title{\LaTeX{} workshop}
\author{Arifin}
\date{July 23, 2023}
\begin{document}
\maketitle
\begin{itemize}
\item First
\item Second
\begin{enumerate}
\item Second-First
\item Second-Second
\end{enumerate}
\end{itemize}
\end{document}
```

Adding mathematical formula

Let's copy + paste in \LaTeX editor and compile

```
\documentclass[11pt,a4paper]{article}
\title{\LaTeX{} workshop}
\author{Arifin}
\date{July 23, 2023}
\begin{document}
\maketitle
This is an inline formula,  $Y = \alpha + \beta X + \gamma Z^2$ .
It views the mathematical expressions within the text.
```

Then this is a display formula,

```
\begin{equation}
\mu = \frac{\sum X_i}{n}
\end{equation}
It displays the mathematical expressions in a separate block.
\end{document}
```

Next on the usmthesis \LaTeX template