

One of the technical aspects of this course will be to learn some basic elements of working with LaTeX. LaTeX is a markup language for documents that can handle mathematical code, styles, citations and bibliographies, graphs and more. But working with the code language does take some practice. We are going to start by setting up an account on Overleaf, a free website for working with LaTeX that can compile your documents for you and convert them into pdfs. Each assignment will build on previous assignments to add more functionality to your document.

1. Inserting Graphs and Creating Tables

Objective

Learn how to:

1. Insert a graph into a document.
2. Create tables to display data.
3. Add figure and table descriptions and alt-text for accessibility.

Steps

1. **Set Up the Document:**

Use the following starter code:

```
\documentclass[12pt]{article}
\usepackage[utf8]{inputenc}
\usepackage{graphicx} % For inserting images
\usepackage{caption} % For captions and alt-text
\usepackage{booktabs} % For professional tables
```

```
\title{Working with Graphs and Tables in LaTeX}
\author{Your Name}
\date{\today}
```

```
\begin{document}
```

```
\maketitle
```

```
\section{Graphs}
```

Below is a graph inserted using the `\texttt{graphicx}` package.

```
\begin{figure}[h!]
  \centering
  \includegraphics[width=0.8\textwidth]{example-graph} % Replace with your image
  filename
  \caption{Sample line graph of monthly sales.}
  \label{fig:graph1}
\end{figure}
```

`\noindent **Alt-text**`: This graph illustrates sales trends over a year, with sales peaking in July and declining towards December.

```
\section{Tables}
```

The table below shows sample data on monthly sales.

```
\begin{table}[h!]  
  \centering  
  \begin{tabular}{@{}lrr@{}}  
    \toprule  
    Month & Sales (Units) & Revenue (\$) \\ \\\br/>    \midrule  
    January & 120 & 2400 \\ \\  
    February & 135 & 2700 \\ \\  
    March & 150 & 3000 \\ \\  
    \bottomrule  
  \end{tabular}  
  \caption{Monthly sales data.}  
  \label{tab:sales}  
\end{table}
```

`\noindent Alt-text`: This table lists sales and revenue data for January to March. Sales and revenue steadily increase over this period.

`\section{Conclusion}`

Write a brief paragraph summarizing what you learned in this assignment.

`\end{document}`

2. **Insert a Custom Graph:**

- Replace example-graph with an actual image file.
- Upload a PNG, JPG, or PDF file to Overleaf.
- Ensure the image is properly cited if it's sourced externally.

3. **Customize the Table:**

- Edit the table to include at least five rows of data.
- Experiment with table formatting (e.g., alignments or adding a border).

4. **Add Descriptions and Alt-Text:**

- Use clear, concise language for both figures and tables.
- Ensure descriptions are meaningful to someone relying on alt-text.

5. **Use Labels for Referencing:**

- Add references in the text to your figure (Figure~\ref{fig:graph1}) and table (Table~\ref{tab:sales}).

6. Include a brief paragraph reflecting on how adding alt-text and clear descriptions improves the document's accessibility.

7. **Submission:** Once the document has been customized to your satisfaction, submit the pdf in the dropbox for the assignment in Blackboard.

Some additional things to consider:

Best Practices for Accessibility in LaTeX

1. Use Alt-Text for Figures and Tables

- Provide concise yet descriptive alt-text for all visual elements.
- Focus on the key insights or data that the image or table conveys.
- Example:
 - Poor alt-text: *A graph of sales.*
 - Good alt-text: *A graph showing monthly sales, with sales peaking in July and declining in December.*

2. Write Clear Captions

- Captions should complement the alt-text but can be slightly more detailed.
- Use captions to explain the context of the figure or table within the document.

3. Label and Reference Figures and Tables

- Use `\label{}` and `\ref{}` to reference figures and tables in the text.
- Avoid phrases like “the table above”; instead, use “Table~\ref{tab:example}.”

4. Avoid Using Color Alone to Convey Information

- If your graph uses colors to differentiate data, include patterns or labels for clarity.
- In R, use tools like `ggplot2` with the `scale_fill_manual()` function to add patterns or `geom_text()` to label points directly.

5. Ensure Adequate Contrast

- Check that text and visual elements have sufficient contrast for readability.
- Use tools like the WCAG Contrast Checker for guidance.

6. Provide Context for Data

- Describe trends, patterns, or anomalies in the text surrounding a graph or table.

7. Use Logical Reading Order

- Ensure elements appear in a logical sequence. Place tables and graphs close to the related text.

8. Choose Accessible Fonts

- Default LaTeX fonts are generally accessible. Avoid overly decorative fonts.

9. Export Graphs with High Resolution

- In R, export images using commands like `ggsave()` with a resolution of at least 300 DPI for clarity.

10. Enable Screen Readers

- For PDF output, ensure proper tagging by using tools like `pdfx` for ISO-compliant PDFs. Add `\usepackage{hyperref}` for clickable links and improved navigation.