

# Bibliography in LaTeX with `biblatex`

This LaTeX document uses the `biblatex` package to manage citations and bibliographies. Below, I'll explain every relevant part of the bibliography setup.

## 1. Including the `biblatex` Package

```
\usepackage[style=ieee, sorting=ynt]{biblatex}
```

- `style=ieee` : This sets the bibliography style to **IEEE** format.
- `sorting=ynt` : Controls how bibliography entries are sorted:
  - `y` → Sort by **year** (oldest first).
  - `n` → Sort by **name** (author/editor).
  - `t` → Sort by **title**.

`biblatex` is more powerful than traditional `bibtex` as it allows more flexible citation formatting.

## 2. Adding the Bibliography File

```
\addbibresource{citations.bib}
```

This tells LaTeX to use `citations.bib` as the **bibliography database**. This file (not shown in your code) should contain entries like:

```
@book{norman2013design,
  author = {Donald A. Norman},
  title = {The Design of Everyday Things},
  year = {2013},
  publisher = {Basic Books}
}

@book{twain2008tom,
  author = {Mark Twain},
  title = {The Adventures of Tom Sawyer},
  year = {2008},
  publisher = {Penguin Classics}
}

@article{wittern2016javascript,
  author = {Ekaterina Wittern and others},
  title = {JavaScript: The Good, the Bad, and the Ugly},
  year = {2016},
  journal = {IEEE Software}
}

@online{wiki2025quaternion,
  author = {Wikipedia},
  title = {Quaternion Mathematics},
  year = {2025},
  url = {https://en.wikipedia.org/wiki/Quaternion}
}
```

## 3. Citing Works in the Document

Different citation commands in `biblatex` allow formatting flexibility.

### Standard Citations

```
We can cite to a work with \cite{norman2013design}.
```

- Outputs: **[1]** (IEEE style)
- This is a numeric citation referring to **[1]** in the bibliography.

## Multiple Citations

```
We can also cite multiple works \cite{norman2013design, twain2008tom, wiki2025quaternion, wittern2016javascript}.
```

- Outputs: **[1, 2, 3, 4]**
- Groups citations into a single set.

## Author-based Citation (`\textcite{}`)

```
\textcite{wittern2016javascript} discussed about a horrible language.
```

- Outputs: **Wittern et al. [4] discussed about a horrible language.**
- Used when integrating the author's name into the sentence.

## Parenthetical Citation (`\parencite{}`)

```
We can put a citation within a parenthesis with \parencite{norman2013design}.
```

- Outputs: **([1])**
- Works similarly to `\cite{}` but explicitly places the citation in parentheses.

## Footnote Citation (`\footcite{}`)

```
Take a look at the wiki of Quaternions \footcite{wiki2025quaternion}.
```

- Creates a citation in a **footnote**.

# 4. Printing the Bibliography

```
\printbibliography[heading=bibintoc, title={Bibliography}]
```

- `heading=bibintoc` : Adds the bibliography to the **table of contents**.
- `title={Bibliography}` : Sets the section title as "Bibliography".

## Alternative Method (BibTeX)

The commented-out lines show an alternative approach:

```
% \bibliographystyle{acm}
% \bibliography{citations}
```

- This uses **BibTeX**, an older system.
- `\bibliographystyle{acm}` → Uses ACM citation style.
- `\bibliography{citations}` → Inserts references from `citations.bib`.
- Requires running `bibtex` separately, whereas `biblatex` works directly with `biber`.

# 5. Differences Between `bibtex` and `biblatex`

Feature	<code>bibtex</code>	<code>biblatex</code>
Citation Styles	Uses <code>\bibliographystyle{}</code>	Uses <code>style=</code> option
Bibliography Command	<code>\bibliography{}</code>	<code>\printbibliography</code>

Processing Tool Feature	Needs <code>bibtex</code>	Uses <code>biber</code> <code>biblatex</code>
Flexibility	Less customizable	More flexible formatting
Multiple Bibliographies	Harder to manage	Fully supported

**Recommendation:** `biblatex` is better for modern LaTeX documents.

## 6. Summary of Commands

Command	Usage
<code>\cite{key}</code>	Numbered citation (e.g., [1] )
<code>\parencite{key}</code>	Parenthetical citation (e.g., ([1]) )
<code>\textcite{key}</code>	Inline author citation (e.g., Author [1] )
<code>\footcite{key}</code>	Footnote citation
<code>\addbibresource{file.bib}</code>	Adds a bibliography file
<code>\printbibliography</code>	Prints bibliography

## 7. Final Thoughts

Your LaTeX document is correctly structured for using `biblatex` with IEEE-style citations. If you're using Overleaf or compiling locally:

1. Compile using **PDFLaTeX**.
2. Run **Biber** to process citations.
3. Recompile with **PDFLaTeX**.

Would you like a more customized bibliography layout or citation style? 😊