Using BibTeX for References and TikZ package

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What is BibTeX?

•**Definition**: A tool for managing bibliographic references in LaTeX documents.

•**Purpose**:

- Automatically format references in various citation styles (APA, IEEE, etc.).
- Simplifies the management of citations in academic and research writing.

•**Who uses it?**: Researchers, students, and professionals in academia.

Why Use BibTeX?

- **Automation**: Handles citation formatting and numbering.
- **Consistency**: Ensures uniform style throughout your paper.
- **Efficiency**: Centralized database for all references.
- **Flexibility**: Supports numerous styles and custom formatting.

Key Components of BibTeX

- **BibTeX File (.bib)**: A file containing all references in a structured format.
- **LaTeX Document (.tex)**: Where citations are inserted using BibTeX commands.
- **Bibliography Style (.bst)**: Determines the appearance of references (e.g., APA, IEEE).

Each BibTeX reference consist of three parts:

Part 1: the entry type

In its current version BibTeX features 14 entry types. A BibTeX entry start with the @ sign followed by the entry type name. Everything that belongs to the entry is enclosed in curly brackets.

```
% basic structure of a BibTeX entry @book{ ... }
```

Part 2: the citekey

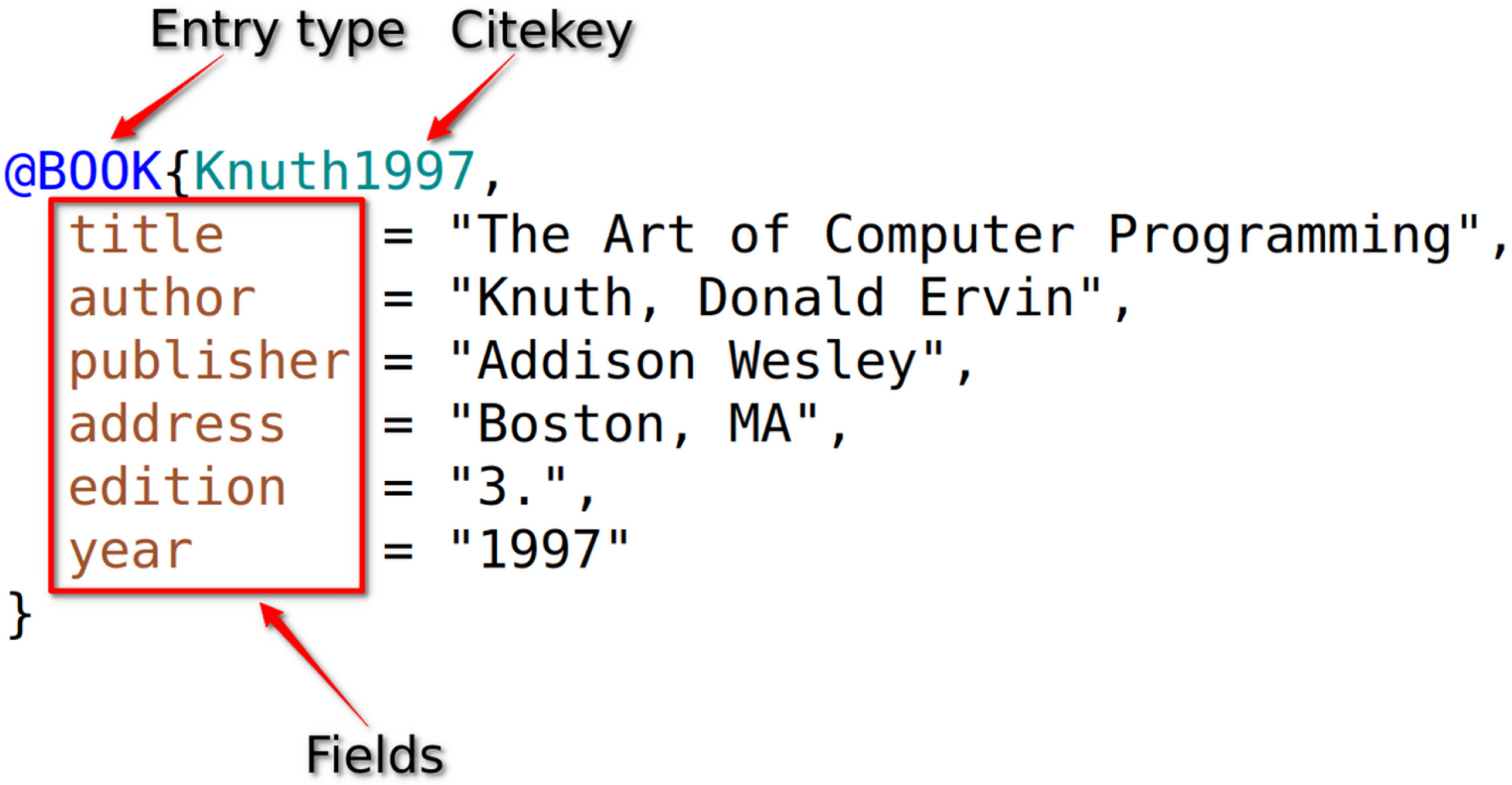
The citekey is the name that is used to uniquely identify the BibTeX entry. It can be any combination of letters and digits and follows immediately after the opening bracket of the BibTeX entry.

```
% basic structure of a BibTeX entry with a citekey @book{MyUniqueCitekey, ... }
```

Part 3: a list of key-value pairs storing the bibliographic data

Finally, the bibliographic data is stored by a list of predefined field types and their corresponding values.

```
% basic structure of a BibTeX entry @book{MyUniqueCitekey, title = "Title of the book", ... }
```


Entry type
Citekey
@BOOK{Knuth1997,
title = "The Art of Computer Programming",
author = "Knuth, Donald Ervin",
publisher = "Addison Wesley",
address = "Boston, MA",
edition = "3.",
year = "1997"
}
Fields

Entry types

BibTeX features 14 entry types that help your organize your references. Each entry type has its own set of required an optional fields to store the bibliographic data that is needed to format the references correctly.

% the entry type names are case insensitive % each variant is valid @book{ ... } @Book{ ... } @BOOK{ ... }

Here is a complete listing of the BibTeX entry types including a short description:

- **article**: any article published in a periodical like a journal article or magazine article
- **book**: a book
- **booklet**: like a book but without a designated publisher
- **conference**: a conference paper
- **inbook**: a section or chapter in a book
- **incollection**: an article in a collection
- **inproceedings**: a conference paper (same as the conference entry type)
- **manual**: a technical manual
- **masterthesis**: a Masters thesis
- **misc**: used if nothing else fits
- **phdthesis**: a PhD thesis
- **proceedings**: the whole conference proceedings
- **techreport**: a technical report, government report or white paper
- **unpublished**: a work that has not yet been officially published

Citekey

The citekey can be any combination of alphanumeric characters including the characters "-", "_", and ":". The most frequent pattern is to use the last name of the first author followed by the year. Let's illustrate the concept on the book "The Theoretical Minimum" by George Hrabovsky and Leonard Susskind originally published 2013.

```
% standard pattern: last name of the first author + year
Hrabovsky2013

% last name of the first author + short version of the year
Hrabovsky13

% If multiple papers are available from the same author in a given ye
% add a suffix like "-1" or "a" and so on
Hrabovsky2013a
Hrabovsky2013-1

% Other variations
Hrabovsky:2013
Hrabovsky-2013
Hrabovsky_2013
HRABOVSKY2013
```

Fields

BibTeX comes with a list of standard fields that are supported by most citation styles. Each entry type has required fields and optional fields. Optional field store additional information that might not be present for each reference, but can still be included in the bibliography entry. Due to the flexible definition of the BibTeX format there are also many non-standard fields that are frequently used, but are only supported by selected BibTeX styles.

```
% the values of field can either be enclosed in { } or " "
   title = "The Theoretical Minimum"
   title = {The Theoretical Minimum}

% the field names are case insensitive: each variant is valid
   title = "The Theoretical Minimum"
   Title = "The Theoretical Minimum"
   TITLE = "The Theoretical Minimum"

% plain numbers do not need to be encloded in { } or " "
   year = 2018
```

Standard field types

- **address**: address of the publisher or the institution
- **annote**: an annotation
- **author**: list of authors of the work
- **booktitle**: title of the book
- **chapter**: number of a chapter in a book
- **edition**: edition number of a book
- **editor**: list of editors of a book
- **howpublished**: a publication notice for unusual publications
- **institution**: name of the institution that published and/or sponsored the report
- **journal**: name of the journal or magazine the article was published in
- **month**: the month during the work was published

Non-standard field types

These fields are frequently used, but are not supported by all BibTeX styles.

- **doi**: DOI number (like 10.1038/d41586-018-07848-2)
- **issn**: ISSN number (like 1476-4687)
- **isbn**: ISBN number (like 9780201896831)
- **url**: URL of a web page

Full bibliography styles compilation

BibTeX bibliography styles collection: 228 bibliography styles

Standard bibliography styles

- abbrv
- acm
- alpha
- apalike
- ieeetr
- plain
- siam
- unsrt

BibTeX bibliography style: ieeetr

```
\documentclass[a4paper,10pt]{article}

\begin{document}

This is an example of a paragraph with in-text
citations using the ieeetr BibTeX style.
Here is a reference to a journal article with
a single author \cite{article1}, to a journal
article with two authors \cite{article2} and
three authors \cite{article3}, and to a book
with four authors \cite{book4}.

\bibliographystyle{ieeetr}
\bibliography{sampleBibFile}
\end{document}
```


[1] D. R. Cox, "Regression models and life-tables," *J. R. Stat. Soc. Series B Stat. Methodol.*, vol. 34, pp. 187–220, June 1972.

[2] E. G. Bligh and W. J. Dyer, "A rapid method of total lipid extraction and purification," *Can. J. Biochem. Physiol.*, vol. 37, pp. 911–917, Aug. 1959.

[3] J. P. Perdew, K. Burke, and M. Ernzerhof, "Generalized gradient approximation made simple," *Phys. Rev. Lett.*, vol. 77, pp. 3865–3868, Oct. 1996.

[4] W. H. Press, S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, *Numerical recipes: the art of scientific computing*. Cambridge, UK: Cambridge University Press, 3 ed., Sept. 2007.

This is an example of a paragraph with in-text citations using the apalike BibTeX style. Here is a reference to a journal article with a single author [1], to a journal article with two authors [2] and three authors [3], and to a book with four authors [4].

BibTeX Q&A for Computer Science Students

Q1: What is BibTeX?

A:

•BibTeX is a reference management tool used with LaTeX documents to format and organize citations and bibliographies automatically.

BibTeX Q&A for Computer Science Students

Q2: Why use BibTeX instead of manually managing references?
A:
Saves time by automating formatting.
Ensures consistent citation style throughout your document.
Easily switches between citation styles (e.g., IEEE, ACM, APA).
Handles large bibliographies efficiently.

BibTeX Q&A for Computer Science Students

Q3: How do I create a BibTeX file?
A:
Create a file with the .bib extension (e.g., references.bib).
Add entries in BibTeX format, such as

```
@article{smith2024,
  author  = {John Smith},
  title   = {A Study on Algorithms},
  journal = {Journal of Computer Science},
  year    = {2024}
}
```

BibTeX Q&A for Computer Science Students

Q4: How do I use BibTeX in my LaTeX document?
A:
Add \bibliography{references} where the bibliography should appear.
Use \cite{} to cite sources within your text (e.g., \cite{smith2024}).
Compile using the BibTeX workflow:

Run pdflatex, then bibtex, and finally pdflatex twice.

BibTeX Q&A for Computer Science Students

Q5: What are common citation styles in BibTeX?

A:
plain: Numeric citations, alphabetically sorted.
IEEE: Common in engineering and computer science.
ACM: Used for ACM papers.
alpha: Author's initials and year (e.g., [SM2024]).

Specify the style using \bibliographystyle{style-name} in your LaTeX file.

BibTeX Q&A for Computer Science Students

Q6: Can I edit BibTeX entries manually?
A:
Yes! Entries are plain text, so you can customize fields like author, title, and year easily.

BibTeX Q&A for Computer Science Students

Q7: What tools help manage BibTeX files?
A:
JabRef: User-friendly BibTeX manager.
Mendeley and **Zotero**: Export bibliographies to BibTeX format.

Online tools like **Overleaf** integrate BibTeX natively.

BibTeX Q&A for Computer Science Students

Q8: How do I debug errors in BibTeX?

A:
Check for typos in your .bib file.

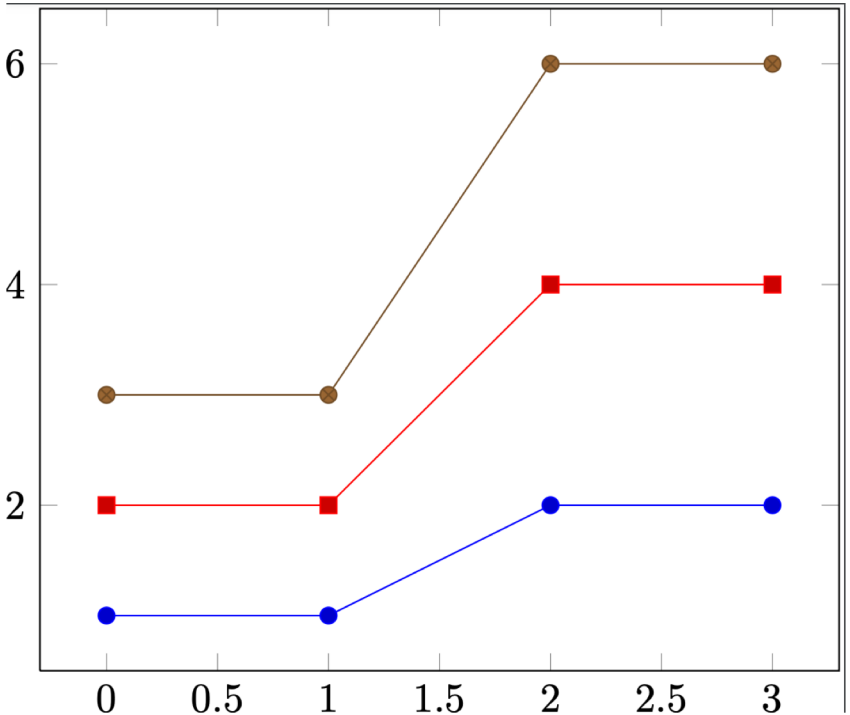
Ensure your LaTeX document includes all necessary commands (\bibliography and \bibliographystyle).

Use a BibTeX editor to validate your file.

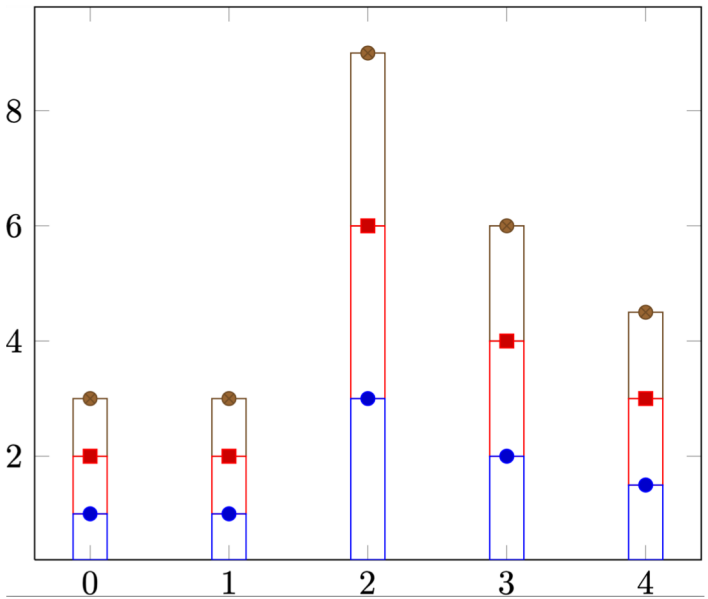
TikZ package

TikZ is probably the most complex and powerful tool to create graphic elements in LATEX. Starting with a simple example, this article introduces some basic concepts: drawing lines, dots, curves, circles, rectangles etc.

Firstly, load the tikz package by including the line \usepackage{tikz} in the preamble of your document, then draw a graphic using the tikzpicture environment.

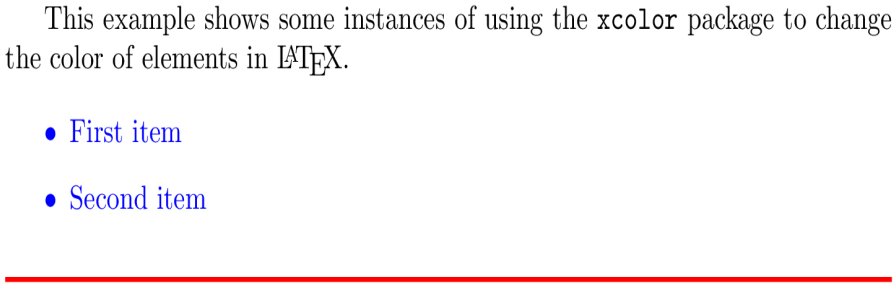



```
\begin{tikzpicture}
\begin{axis}[stack plots=y]
\addplot coordinates {(0,1) (1,1)
(2,2) (3,2)};
\addplot coordinates {(0,1) (1,1)
(2,2) (3,2)};
\addplot coordinates {(0,1) (1,1)
(2,2) (3,2)};
\end{axis}
\end{tikzpicture}
```




```
\begin{tikzpicture}
\begin{axis}[stack
plots=y,/tikz/ybar]
\addplot coordinates {(0,1) (1,1)
(2,3) (3,2) (4,1.5)};
\addplot coordinates {(0,1) (1,1)
(2,3) (3,2) (4,1.5)};
\addplot coordinates {(0,1) (1,1)
(2,3) (3,2) (4,1.5)}; \end{axis}
\end{tikzpicture}
```

Using colors in LaTeX




```
\documentclass{article}
\usepackage{xcolor}
\begin{document}
This example shows some instances of using the \texttt{xcolor} package to change the color of elements in \LaTeX.
\begin{itemize}
\color{blue}
 \item First item
\item Second item
\end{itemize}
\noindent {\color{red}
\rule{\linewidth}{0.5mm}}
\end{document}
```

\usepackage{xcolor}

Accessing additional named colors

Additional named colors can be accessed via the following xcolor package options:

•dvipsnames: loads 68 named colors (CMYK)

•svgnames: loads 151 named colors (RGB)

•x11names: loads 317 named colors (RGB)

For example, if you write

\usepackage[dvipsnames]{xcolor}

you can access the following named colors:

Footnotes

The \footnote command is the core LaTeX command for creating footnotes and takes two forms:

•\footnote{*text for footnote*}: This inserts an (automatically-generated) superscript number, called the footnote *marker*, into the document text and also creates the corresponding footnote at the bottom of the page, containing the corresponding footnote *marker* and *text for footnote*.

•\footnote[*number*]{*text for footnote*}: This form of the command uses the optional value *number* to create the superscript footnote *marker*; it also inserts the corresponding footnote at the bottom of the page, containing the identifying footnote marker (*number*) and *text for footnote*.

I'm writing to demonstrate use of automatically-generated footnote markers[1] and footnotes which use a marker value provided to the command[42].

Now, I will use another automatically-generated footnote marker[2].

[1] Automatically generated footnote markers work fine!

[42] ...is that the answer to everything?

[2] Now, footnote markers are 1, 42, but then back to 2? That will be confusing if the automatically-generated number also reaches 42!

Example: using the \footnote command

Here is an example which demonstrates the two variants of \footnote:

•\footnote{Automatically generated footnote markers work fine!} automatically typesets the numeric (superscript) value (1) for the footnote marker, whereas

•\footnote[42]{...is that the answer to everything?} uses 42 as the value of the footnote marker and, as you may observe, it does not increment the integer used for auto-creation of markers: the third footnote has a marker value of 2.

References :

- https://www.bibtex.com/
- https://fr.overleaf.com/learn/latex/Bibliography_management_with_bibtex
- https://pgfplots.sourceforge.net/gallery.html
- https://tikz.org/examples/chapter-14-drawing-diagrams/