UiO **:** **Department of Informatics**
University of Oslo

Local guide to BibLATEX

Knut Hegna, Dag Langmyhr

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Introduction

ALMOST EVERY SCIENTIFIC DOCUMENT contains a reference list or bibliography.[1] Creating such a reference list or bibliography can be a lot of work, but fortunately the LaTeX document system provides good tools: the biblatex package and the biber sorting program. Using these, it is relatively simple to

- create a database of all your references,
- automatically select the references cited in a particular document and
- adapt the bibliography to the layout prescribed by the publisher.

This guide will teach you how to use BibLaTeX.

A tiny example (p 3) will provide a minimal demonstration of how to use BibLaTeX.

The bibliography database (p 7) describes how you may construct you own database.

Using citations (p 11) explains how to use BibLaTeX and citations in your documents.

Various reference styles (p 15) demonstrates several different bibliography styles.

Multiple bibliographies (p 21) are sometimes required; this chapter shows how to achieve that.

Running auxiliary programs (p 29) describes the sorting and extraction program biber and some alternatives.

Miscellaneous (p 31) mentions other information that might be of interest.

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[1] To be precise, a *reference list* is a list of publications cited in the document, while a *bibliography* is a list of publications relevant to the topic discussed. In this guide, however, we will not distinguish between the two.

Chapter **1**

A tiny example

To demonstrate how easy it is to use BibLaTeX, we will give an example.

1.1 The bibliography database

The first step is to create a bibliography database; Emacs or any similar text editor may be used. In this example, the file is named mini.bib and is shown in Figure 1.1.

```
mini.bib
1  @article{Breaklines,
2    author =      {Donald E. Knuth and Michael F. Plass},
3    title =       {Breaking Paragraphs into Lines},
4    journaltitle = {Software---Practice and Experience},
5    volume =      11,
6    year =        1981,
7    pages =       {1119-1184}
8  }

9  @book{TeX-book,
10   author =      {Donald E. Knuth},
11   title =       {The {\TeX}book},
12   publisher =   {Addison-Wesley},
13   year =        1984,
14   isbn =        "0-201-03801-3"
15 }

16 @book{LaTeX2,
17   author =      {Leslie Lamport},
18   title =       {{\LaTeX}: A Document Preparation System: User's
19                  Guide \& Reference Manual},
20   publisher =   {Addison-Wesley},
21   year =        1994,
22   edition =     2,
23   isbn =        "0-201-52983-1"
24 }
```

Figure 1.1: A tiny bibliography database
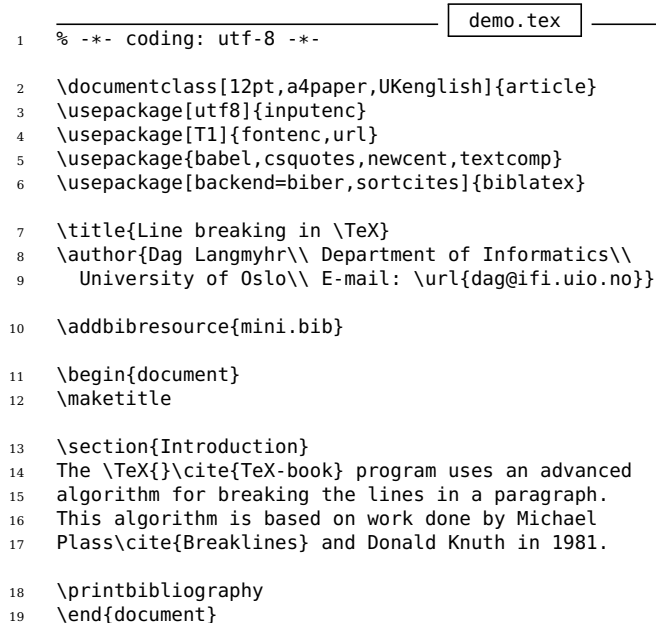
The database contains three records:

- The first document is an article by Donald Knuth and Michael Plass; it was published in a journal named *Software—Practice and Experience* in 1981. Additional information gives the journal volume and the page numbers.

- The second document is the pivotal book in the T_EX world: *The T_EX-book* by Donald Knuth. It was published by *Addison-Wesley* in 1984.

- The final document is the second edition of Leslie Lamport's book about LaTeX.

Each entry starts with a specification of what kind of document we have ("@article" or "@book"). Then comes a unique key that you can choose yourself ("Breaklines", "TeX-book" and "LaTeX2"); this key is used when you want to refer to the document. After that comes all the information you have on the document.

1.2 The article

We can now write our article; the LaTeX code file demo.tex is shown in Figure 1.2.[1]

```
1   % -*- coding: utf-8 -*-

2   \documentclass[12pt,a4paper,UKenglish]{article}
3   \usepackage[utf8]{inputenc}
4   \usepackage[T1]{fontenc,url}
5   \usepackage{babel,csquotes,newcent,textcomp}
6   \usepackage[backend=biber,sortcites]{biblatex}

7   \title{Line breaking in \TeX}
8   \author{Dag Langmyhr\\ Department of Informatics\\
9     University of Oslo\\ E-mail: \url{dag@ifi.uio.no}}

10  \addbibresource{mini.bib}

11  \begin{document}
12  \maketitle

13  \section{Introduction}
14  The \TeX{}\cite{TeX-book} program uses an advanced
15  algorithm for breaking the lines in a paragraph.
16  This algorithm is based on work done by Michael
17  Plass\cite{Breaklines} and Donald Knuth in 1981.

18  \printbibliography
19  \end{document}
```

Figure 1.2: A tiny LaTeX document

The following commands are relevant to the bibliography:

- Line #5: The package csquotes provides international handling of quote marks and should always be included when you use the biblatex package.

- Line #6: We load the package biblatex and specify that we will use biber for sorting. Option sortcites will sort lists of citations; see hint on page 15.

---

[1] The specification "% -*- coding: utf-8 -*-" in the first line tells the Emacs editor that the file uses the UTF-8 encoding; it is regarded as a comment by LaTeX. You may omit this line if you use a different editor.

- Line #10: The \addbibresource command is required to provide the bibliography database file name.

- Lines #14 and #17: We reference documents in the bibliography database with the \cite command.

- Line #18: \printbibliography indicates where in the document we want the reference list.

1.3 The processing

When we run[2] LaTeX on our document the first time:

```
$ pdflatex demo.tex
```

we are notified that our references (using the \cite command) are unknown:

```
LaTeX Warning: Citation 'TeX-book' on page 1
               undefined on input line 14.
LaTeX Warning: Citation 'Breaklines' on page 1
               undefined on input line 17.
```

To remedy this, we must run a program called biber:

```
$ biber demo
```

A second LaTeX run produces a correct document:

```
$ pdflatex demo.tex
```

1.4 The final document

The final document is shown in Figure 1.3 on the following page. We notice particularly that

- the commands \cite{*key*} have been replaced by the references [1] and [2].

- the command \printbibliography has produced the list of references; it contains the two cited works (and only those).

- the entries in the list of references have been alphabetically sorted.

---

[2] If you process your LaTeX document on an Ifi computer, we recommend using the ltx program developed locally. It will run pdflatex several times (if required) and also run auxiliary programs like biber automatically. Thus, you just need

```
$ ltx demo
```

Line breaking in TEX

Dag Langmyhr
Department of Informatics
University of Oslo
E-mail: dag@ifi.uio.no

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1   Introduction

The TEX[1] program uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass[2] and Donald Knuth in 1981.

References

[1]   Donald E. Knuth. *The TEXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

[2]   Donald E. Knuth and Michael F. Plass. 'Breaking Paragraphs into Lines'. In: *Software—Practice and Experience* 11 (1981), pp. 1119–1184.

1

Figure 1.3: The document generated from Figure 1.2

Chapter 2

The bibliography database

As mentioned, a bibliography database is a file containing information on articles, books and other documents. The main principle of this database is that it should contain facts about these documents but nothing about the visual presentation.

Every user should create his or her own BibLaTeX database of every document you want to reference or may want to reference in the future. In which folder you put this database file depends on your operating system and your LaTeX distribution.[1] If you are uncertain about this, you can put the file in the same folder as your LaTeX files; this will always work.

2.1 Database structure

A bibliography database is a collection of records, each providing information about one publication. Each record looks like this:

```
@kind {key,
  info = value,
  info = value,
       ⋮
}
```

@kind specifies what kind of document it is, i.e., whether it is a book, an article, a thesis or whatever. A list of different document kinds can be found in Section 2.2 on the next page.

key is the document's key which you use to refer to the document. You choose the key yourself.

info indicates an aspect of information regarding this document, like author, title, publisher or something else; for more information, see Section 2.4 on page 9.

---

[1] On Ifi's Linux computers you place the database file in ~/texmf/bibtex/bib/.

value is the actual information provided. It is normally quoted in either braces or double quote signs:[2]

```
title = {Breaking Paragraphs into Lines}
title = "Breaking Paragraphs into Lines"
```

Single numbers (like a year) or abbreviations (see Section 2.5 on the next page) should not be quoted.

If the value contains text that *must not be changed* (i.e., LaTeX commands, capitals, acronyms or similar), you may protect it by an extra set of braces:

```
journaltitle = "{BYTE}"
publisher = {{O'R}eilly}
```

2.2 Document kinds

Table 2.1 shows the most common kinds of documents; for a complete list, see [5, Section 2.1].

@**article**	A journal article
@**book**	A published book
@**booklet**	Like a book, but no publisher
@**inproceedings**	Article in conference proceedings
@**manual**	Technical documentation
@**misc**	Does not fit any other kind
@**online**	A web page or other online resource
@**reference**	A dictionary or similar
@**report**	Research report or similar
@**thesis**	Any kind of thesis (use **type** entry to specify; see Table 2.2 on page 10)
@**unpublished**	Not yet published

Table 2.1: Kinds of documents

2.3 Author names

The name of the author or authors is perhaps the most important item of information in a bibliography. Normally, you just list their names with "**and**" between. (The "and" will automatically be substituted by a comma or the proper word in the document language.)

```
author = {name₁ and name₂ and name₃}
```

If a publication has additional authors whose name you do not know, end the list with "**others**":

```
author = {name₁ and name₂ and others}
```

---

[2] To BibLaTeX, the two forms of quoting are equivalent; you can choose the one you prefer.

Each name is given in either of these two forms:

- ***First_name Family_name***

- ***Family_name, First_name***

The two forms are equivalent, but you should use the latter form when the name is more complex, as in[3]

```
author = {Brinch Hansen, Per}
author = {Morgenstierne, Vilhelm Ludvig Herman von Munthe af}
author = {Vallée Poussin, Charles-Jean Étienne Gustave Nicolas de la}
```

You should also use this form if the author's name has a "Jr" part:

```
author = {Ford, Jr., Henry}
```

2.4 Additional information

Table 2.2 on the following page shows the most common kinds of information given; for a complete list, see [5, Section 2.2]. Supply as much information as possible for each publication; BibLaTeX will only use what is relevant.

2.5 Abbreviations

As the database gets larger, you may find that some of the information is repeated. To save yourself typing and also ensure consistency, you can create abbreviations for this information:

```
@string{name = {long name}}
```

When *name* is used in a record, *long name* will be substituted, as you can see demonstrated in Figure 2.1. As shown there, @string definitions should always be placed first in the bib file.

```
                              ┌─────────┐
──────────────────────────────┤ mini2.bib ├──────────────────────────────
                              └─────────┘
@string{DEK = {Donald E. Knuth}}
@string{AW = {Addison-Wesley}}

@book{TeX-book,
  author =        DEK,
  title =         {The {\TeX}book},
  publisher =     AW,
  year =          1984,
  isbn =          "0-201-03801-3"
}
```

Figure 2.1: A bibliography with abbreviations

---

[3] BibLaTeX can handle some complex names, like *Ludwig van Beethoven*, but not all, so it is safest to use the comma form for all such names.

author	The author's name (see Section 2.3 on page 8)
chapter	The particular chapter
date	The date of publication (as yyyy-mm-dd)
doi	The document's DOI identification
edition	The edition (as a number)
institution	Business or academic institution
isbn	International standard book number
issn	International standard serial number
journaltitle	The title of the journal
keywords	A comma-separated list of keywords for the entry (see Section 5.1 on page 21)
location	Where the publisher or institution resides
month	The month of publication (as a number or an abbreviation; see Section 2.5.1)
note	Additional data
pages	Which pages
publisher	The publishing company
subtitle	The document subtitle
title	The document title
type	The specific type (e.g., of a @thesis)
url	A web address
urldate	When the document was accessed (as yyyy-mm-dd)
version	A version number (as a number)
year	The year of publication

Table 2.2: Kinds of database information

Note

Do not quote abbreviations as this will prevent the expansion; in other words,

author = DEK   ⇒   Donald E. Knuth
author = {DEK}   ⇒   DEK

2.5.1 The names of the months

There exist twelve predefined macros for the names of the months:

jan, feb, mar, apr, may, jun, jul, aug, sep, oct, nov, dec

These expand to the name of the month in the proper language.

Chapter 3

Using citations

3.1 The biblatex package

To utilise BibLaTeX you need to import the biblatex package:

```
\usepackage[options]{biblatex}
```

The most common package options are listed in Table 3.1.

backend=biber	Use biber as backend for sorting (recommended, see Section 6.1 on page 29)
backend=bibtex	Use bibtex as backend for sorting (see Section 6.2 on page 29)
backend=bibtex8	Use bibtex8 as backend for sorting (see Section 6.3 on page 30)
bibencoding=latin1	Specify bib file encoding (see Section 7.1 on page 31)
bibencoding=utf8	Specify bib file encoding (see Section 7.1 on page 31)
defernumbers	Safe but slow assignment of reference numbers (see Section 5.1 on page 21)
maxbibnames=*n*	Maximum number of authors listed in the bibliography (see Section 3.4.1 on page 14)
minbibnames=*n*	Number of authors in abbreviated lists in the bibliography (see Section 3.4.1 on page 14)
sortcites	Sort citation sequences
sortlocale=nb_NO	Sort bibliography according to Norwegian rules. (The default is English.)
style=*xxx*	Specifies which bibliography style to use (see Section 4 on page 15)

Table 3.1: biblatex package options

3.1.1 Typesetting URLs

Normally, BibLaTeX uses a `teletype font` when typesetting URLs. We suggest you use a `sans serif font` instead for improved line breaking.

> **Hint**
>
> Always add the specification \urlstyle{sf} just after the specification \usepackage[. . .]{biblatex}.

> **Hint**
>
> If you include the package hyperref, the URL will become a clickable link in the PDF file.

3.2 The \addbibresource command

This command lists all your bibliography files:[1]

```
\addbibresource{mini.bib}
\addbibresource{education.bib}
```

It must be placed in the preamble, i.e., before \begin{document}. Each call contains only one file name, but it may be used repeatedly to name more files. Note that the .bib suffix *must be included*.

3.3 The \cite command

This command is used whenever you want to reference a document:

```
... created by Leslie Lamport.\cite{LaTeX2}
```

You may reference several documents in the same call:

```
... documents on \TeX.\cite{TeX-book,Breaklines}
```

Note that this produces far better output than using the command twice as in "\cite{TeX-book}\cite{Breaklines}".

> **Hint**
>
> Avoid putting a \cite just before a full stop; it looks better if you put it *after* the full stop.

3.3.1 Providing additional citation information

It is possible to add information to a citation, both before and after. The full syntax is

```
\cite[prefix info][postfix info]{key}
```

Note that if either the prefix or postfix info looks like a number or a number range (using either standard Hindu-Arabic numbers or Roman numerals), it will be treated as a page number, as shown in table :

---

[1] The old \bibliography command from BibTEX still works, however, in case you prefer to use that. This command (which must also be used in the preamble) may only be called once, but it accepts a comma-separated list of file names.

\cite{TeX-book}	[4]
\cite[44]{TeX-book}	[4, p. 44]
\cite[Ref][]{TeX-book}	[Ref 4]
\cite[See also][xiv]{TeX-book}	[See also 4, p. xiv]

Table 3.2: Using the \cite command

3.3.2 Variant \cite commands

You may use variants of the \cite command to produce particular information in a reference, as shown in Table 3.3.[2]

\citeauthor{TeX-book}	Knuth
\citetitle{TeX-book}	*The T$_E$Xbook*
\citeurl{biber}	http://www.ctan.org/tex-archive/biblio/biber
\citeyear{TeX-book}	1984
\footcite{TeX-book}	As a footnote[3]
\parencite{TeX-book}	Adds parentheses: (Knuth 1984)
\textcite{TeX-book}	For flowing text: Knuth [4]

Table 3.3: \cite variants

Use the \citeauthor, \citetitle, \citeyear and \textcite commands to ensure a consistent appearance of your document. This is particularly important when using alphabetic citation styles to achieve a flowing readable text.

The \parencite should be used when the citation style does not provide parenthesis automatically (e.g., alphabetic styles).

The \footcite will put the citation in a footnote in the citation style selected, as shown in footnote no 3.

3.3.3 The \nocite command

The \nocite command is used when you want to include an entry in the list of references without actually \cite-ing it in the text.

```
\nocite{biber}
\nocite{*}
```

The **∗** version will include *all* entries in the bibliography files.

---

[2] Note that the \cite variants in Table 3.3 will not generate clickable links when using the hyperref package.

[3] Knuth, *The T$_E$Xbook*

3.4 The \printbibliography command

This command is placed wherever you want the bibliography to appear:

```
\printbibliography[options]
```

You may provide options to control the appearance of the bibliography; the most common ones are listed in Table 3.4. The BibLaTeX guide[5, Section 3.6.2] contains a complete list.

heading=*name*	replaces the default header[†]
keyword=*keyword*	prints only entries with the given keyword (see Section 5.1 on page 21).
notkeyword=*keyword*	does the opposite of the keyword option.
prenote=*name*	prints a note[‡] before the list of references.
postnote=*name*	prints a note[‡] after the list of references.
title=*text*	replaces the default header ("References" or "Bibliography") with the text given.
type=*entry type*	limits the reference list to entries of the given entry type (book, article, online, ...; see Section 5.1 on page 21).
nottype=*entry type*	does the opposite of the type option.

[†] Heading names are defined with the \defbibheading command; see [5, Section 3.6.2]. A few names like bibliography and subbibliography are predefined; for an example, see Section 5.2 on page 24.

[‡] Pre- and postnotes are defined using the \defbibnote command; see [5, Section 3.6.8].

Table 3.4: \printbibliography options

3.4.1 Number of authors listed

If a list of authors in the bibliography is very long, BibLaTeX will print only the first ones followed by "et al" (or something similiar in the appropriate language), but exactly what is regarded as "very long"? This is controlled by the following two options to biblatex (see Table 3.1 on page 11):

maxbibnames=*n* specifies that the limit for number of authors is *n*. In other words, if there are more than *n* authors, the list will be abbreviated. The default value for *n* is 3.

minbibnames=*n* controls how many authors are listed in an abbreviated list; the default is 1.

As an example, if you want to keep all authors if there are five or fewer, but use just the first three authors and "et al" if there are more than five, you should use the options

```
\usepackage[maxbibnames=5,minbibnames=3,...]{biblatex}
```

Chapter 4

Various reference styles

4.1 The standard styles

BibLaTeX comes with a set of standard styles that should cater for most needs.

4.1.1 Standard style "numeric"

The standard style "numeric" uses numeric references. It is the default BibLaTeX style.

\usepackage[backend=biber,style=numeric,sortcites]{biblatex}

The TeX[1] program uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass[2] and Donald Knuth in 1981.

References

[1] Donald E. Knuth. *The TeXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

[2] Donald E. Knuth and Michael F. Plass. 'Breaking Paragraphs into Lines'. In: *Software—Practice and Experience* 11 (1981), pp. 1119–1184.

Figure 4.1: Standard style "numeric"

Hint

You should always employ the option **sortcites** when you use a numeric style like the standard one — it will sort a sequence like "[9,11,8,3,9]" into "[3,8,9,11]".

4.1.1.1 Standard style "numeric-comp"

This "compressed numeric" style is similar to the "numeric" style just described, but it will compress successive indices into ranges; for instance,

$$[10,7,12,7,5,2,3,11,4] \quad \Rightarrow \quad [2\text{–}5,7,10\text{–}12]$$

4.1.2 Standard style "alphabetic"

This style uses references composed of letters from the author's name and the year of publication.

\usepackage[backend=biber,style=alphabetic]{biblatex}

The TeX[Knu84] program uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass[KP81] and Donald Knuth in 1981.

References

[Knu84]   Donald E. Knuth. *The TeXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

[KP81]   Donald E. Knuth and Michael F. Plass. 'Breaking Paragraphs into Lines'. In: *Software—Practice and Experience* 11 (1981), pp. 1119–1184.

Figure 4.2: Standard style "alphabetic"

4.1.3 Standard style "authoryear"

This style uses the author's last name in combination with the publication year. You may want to use the \parencite command rather than \cite to include a pair of parentheses; see Table 3.3 on page 13.

\usepackage[backend=biber,style=authoryear]{biblatex}

The TEX (Knuth 1984) program uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass (Knuth and Plass 1981) and Donald Knuth in 1981.

References

Knuth, Donald E. (1984). *The TEXbook*. Addison-Wesley. ISBN: 0-201-03801-3.

Knuth, Donald E. and Michael F. Plass (1981). 'Breaking Paragraphs into Lines'. In: *Software—Practice and Experience* 11, pp. 1119–1184.

Figure 4.3: Standard style "authoryear"

4.1.4 Standard style "authortitle"

This style uses the author's last name in combination with the title. You may want to use the \parencite command rather than \cite to include a pair of parentheses; see Table 3.3 on page 13.

\usepackage[backend=biber,style=authortitle]{biblatex}

The TEX (Knuth, *The TEXbook*) program uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass (Knuth and Plass, 'Breaking Paragraphs into Lines') and Donald Knuth in 1981.

References

Knuth, Donald E. *The TEXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

Knuth, Donald E. and Michael F. Plass. 'Breaking Paragraphs into Lines'. In: *Software—Practice and Experience* 11 (1981), pp. 1119–1184.

Figure 4.4: Standard style "authortitle"

4.2 Contributed styles

Other people have contributed styles according to various specifications in use.

4.2.1 The style "apa"

The APA style[8] is defined by the *American Psychological Association* and is widely used in social sciences. Philip Kime[2] has implemented it in BibLaTeX, and it is included in most LaTeX distributions.

```
\usepackage[backend=biber,style=apa]{biblatex}
```

The TEX program (Knuth, 1984) uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Knuth and Plass (1981).

References

Knuth, D. E. (1984). *The TEXbook*. Addison-Wesley.
Knuth, D. E., & Plass, M. F. (1981). Breaking paragraphs into lines. *Software—Practice and Experience*, *11*, 1119–1184.

Figure 4.5: The "apa" style

Note

You may have to experiment using either \cite, \parencite or \textcite to get the appearance you want.

4.2.2 **The style "chicago"**

The Chigaco style[9] is defined by the *University of Chicago press* and is one of the most popular styles today, particularly in books and magazines in history and the social sciences. The BibLATEX implementation is by David Fussner[1].

\usepackage[backend=biber,authordate]{biblatex-chicago}

The TEX program (Knuth 1984) uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass and Donald Knuth; see Knuth and Plass (1981).

References

Knuth, Donald E. 1984. *The TEXbook*. Addison-Wesley. ISBN: 0-201-03801-3.

Knuth, Donald E., and Michael F. Plass. 1981. 'Breaking Paragraphs into Lines'. *Software—Practice and Experience* 11:1119–1184.

Figure 4.6: The "chicago" style

Note

You may have to experiment using either \cite, \parencite or \textcite to get the appearance you want.

4.2.3 **The style "vancouver"**

The Vancouver style[7] is mainly used in physics and medicine. It was adapted to BibLATEX by Agnibho Mondal.[6]

\usepackage[backend=biber,style=vancouver]{biblatex}

The TEX program[1] uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass and Donald Knuth; see [2].

References

1. Knuth DE. The TEXbook. Addison-Wesley, 1984

2. Knuth DE and Plass MF. Breaking Paragraphs into Lines. Software—Practice and Experience. 1981; 11:1119–84

Figure 4.7: The "vancouver" style

Chapter 5

Multiple bibliographies

Most documents have just one bibliography, but sometimes several are required.

5.1 Splitting the bibliography

It is easy to split the bibliography and get one for articles, one for books etc. Figure 5.1 on the following page shows an example which incorporates the following changes:

- Line #6: The option defernumbers is needed, as it is more difficult to assign reference numbers when there are several bibliographies.

- Line #21: The \printbibliography option type specifies that only articles should be included. The title is also changed.

- Line #22: Similarly, the books are listed in the second bibliography.

The result can be seen in Figure 5.2 on page 23.

Alternatively, you may split the bibliography according to your own choice. If you add a **keyword** item to your database entries, you can use this as a selection criteria:

```
\printbibliography[keyword=xxx,title=Yyy]
```

```
                                    ┌─────────────────┐
                          ───────────│  split-demo.tex  │──────────────
 1   % -*- coding: utf-8 -*-         └─────────────────┘

 2   \documentclass[11pt,a4paper,UKenglish]{article}
 3   \usepackage[utf8]{inputenc}
 4   \usepackage[T1]{fontenc,url}
 5   \usepackage{babel,csquotes,newcent,textcomp}
 6   \usepackage[backend=biber,sortcites,defernumbers]{biblatex}

 7   \title{Line breaking in \TeX}
 8   \author{Dag Langmyhr\\ Department of Informatics\\
 9     University of Oslo\\ E-mail: \url{dag@ifi.uio.no}}

10   \addbibresource{mini.bib}

11   \begin{document}
12   \maketitle

13   \section{Introduction}
14   The \TeX{}\cite{TeX-book} program uses an advanced
15   algorithm for breaking the lines in a paragraph.
16   This algorithm is based on work done by Michael
17   Plass\cite{Breaklines} and Donald Knuth in 1981.

18   \section{\LaTeX}
19   \LaTeX\cite{LaTeX2} is an extension of
20   \TeX\cite{TeX-book} programmed in \TeX{} itself.

21   \printbibliography[type=article,title=Articles]
22   \printbibliography[type=book,title=Books]
23   \end{document}
```

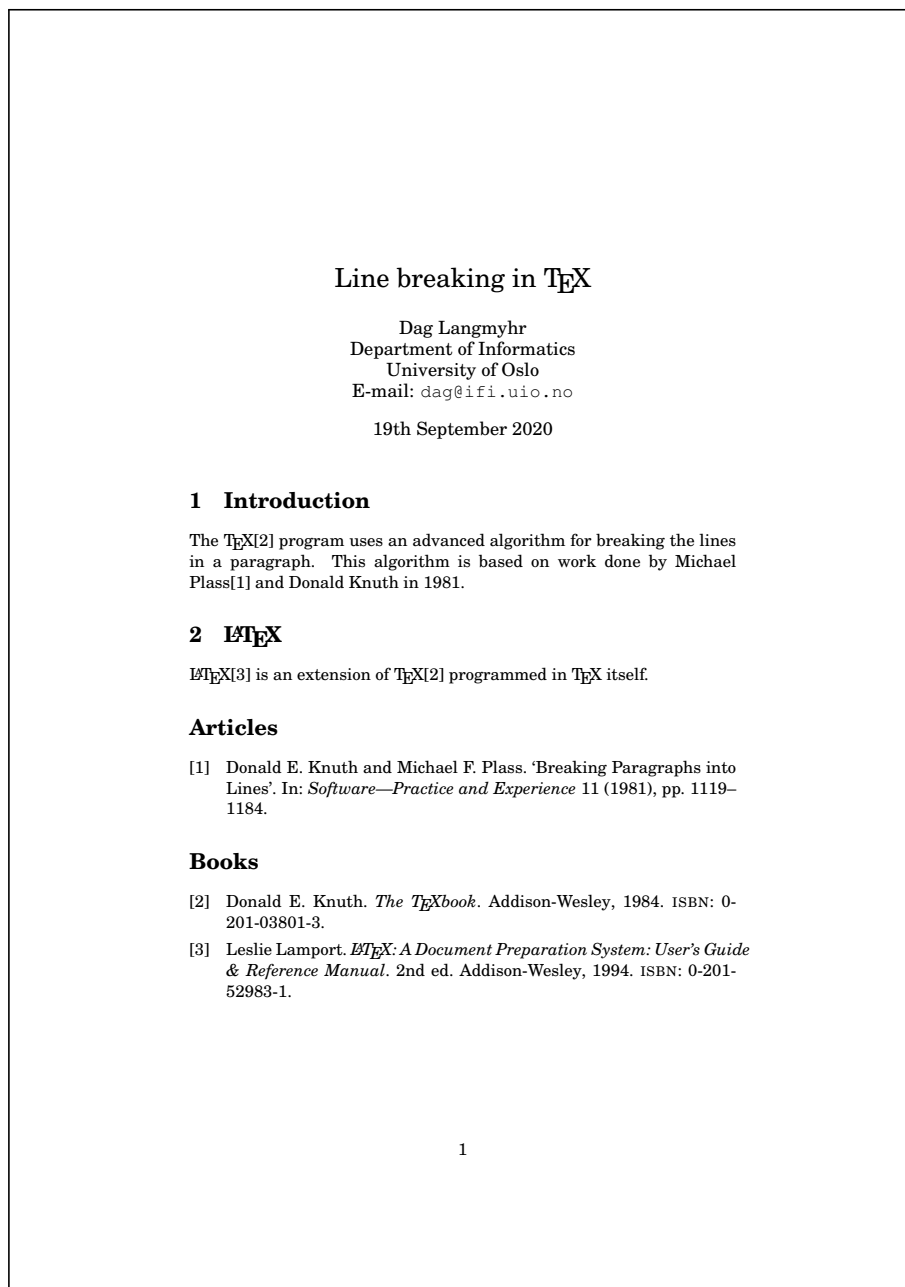**Figure 5.1:** A LATEX document specifying a split bibliography

Line breaking in TEX

Dag Langmyhr
Department of Informatics
University of Oslo
E-mail: dag@ifi.uio.no

19th September 2020

1 Introduction

The TEX[2] program uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass[1] and Donald Knuth in 1981.

2 LATEX

LATEX[3] is an extension of TEX[2] programmed in TEX itself.

Articles

[1] Donald E. Knuth and Michael F. Plass. 'Breaking Paragraphs into Lines'. In: *Software—Practice and Experience* 11 (1981), pp. 1119–1184.

Books

[2] Donald E. Knuth. *The TEXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

[3] Leslie Lamport. *LATEX: A Document Preparation System: User's Guide & Reference Manual*. 2nd ed. Addison-Wesley, 1994. ISBN: 0-201-52983-1.

1

Figure 5.2: The document generated from Figure 5.1

5.2 **One bibliography per chapter**

BibLaTeX supports having a separate bibliography for each chapter (or any part of the document). Just add a \begin{refsection}...\end{refsection} environment around any piece of text, and use a \printbibliography in that environment, as shown in Figure 5.3.

- Lines #19 and #25: Since the bibliography is now inside a section, we want a smaller heading.

The result can be seen in Figure 5.4 on the next page.

```
chap-demo.tex
1   % -*- coding: utf-8 -*-

2   \documentclass[11pt,a4paper,UKenglish]{article}
3   \usepackage[utf8]{inputenc}
4   \usepackage[T1]{fontenc,url}
5   \usepackage{babel,csquotes,newcent,textcomp}
6   \usepackage[backend=biber,sortcites]{biblatex}

7   \title{Line breaking in \TeX}
8   \author{Dag Langmyhr\\ Department of Informatics\\
9     University of Oslo\\ E-mail: \url{dag@ifi.uio.no}}

10  \addbibresource{mini.bib}

11  \begin{document}
12  \maketitle

13  \section{Introduction}
14  \begin{refsection}
15    The \TeX{}\cite{TeX-book} program uses an advanced
16    algorithm for breaking the lines in a paragraph.
17    This algorithm is based on work done by Michael
18    Plass\cite{Breaklines} and Donald Knuth in 1981.

19    \printbibliography[heading=subbibliography]
20  \end{refsection}

21  \section{\LaTeX}
22  \begin{refsection}
23    \LaTeX\cite{LaTeX2} is an extension of
24    \TeX\cite{TeX-book} programmed in \TeX{} itself.

25    \printbibliography[heading=subbibliography]
26  \end{refsection}
27  \end{document}
```

Figure 5.3: A LaTeX document with a bibliography in every chapter

Line breaking in TEX

Dag Langmyhr
Department of Informatics
University of Oslo
E-mail: dag@ifi.uio.no

19th September 2020

1   Introduction

The TEX[1] program uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass[2] and Donald Knuth in 1981.

References

[1]   Donald E. Knuth. *The TEXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

[2]   Donald E. Knuth and Michael F. Plass. 'Breaking Paragraphs into Lines'. In: *Software—Practice and Experience* 11 (1981), pp. 1119–1184.

2   LATEX

LATEX[2] is an extension of TEX[1] programmed in TEX itself.

References

[1]   Donald E. Knuth. *The TEXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

[2]   Leslie Lamport. *LATEX: A Document Preparation System: User's Guide & Reference Manual*. 2nd ed. Addison-Wesley, 1994. ISBN: 0-201-52983-1.

1

Figure 5.4: The document generated from Figure 5.3

5.3 Having all bibliographies at the end

A variant of the previous example is to have separate bibliographies for the chapters, but collect them all at the end of the document. This can be achieved by the LaTeX code in Figure 5.5.

- Lines #14 and #21: Place a \begin{refsection}...\end{refsection} around each chapter (or whichever part of the text that requires a separate bibliography).

- Lines #25 and #26: Each call on \printbibliography will print one bibliography. To specify a particular refsection, use "section=*n*"; the refsections are automatically numbered 1, 2, 3, ... Also note that the title should be modified.

Figure 5.6 on the next page shows the final document.

```
                                    ┌─ end-demo.tex ─┐
1   % -*- coding: utf-8 -*-

2   \documentclass[11pt,a4paper,UKenglish]{article}
3   \usepackage[utf8]{inputenc}
4   \usepackage[T1]{fontenc,url}
5   \usepackage{babel,csquotes,newcent,textcomp}
6   \usepackage[backend=biber,sortcites]{biblatex}

7   \title{Line breaking in \TeX}
8   \author{Dag Langmyhr\\ Department of Informatics\\
9     University of Oslo\\ E-mail: \url{dag@ifi.uio.no}}

10  \addbibresource{mini.bib}

11  \begin{document}
12  \maketitle

13  \section{Introduction}
14  \begin{refsection}
15    The \TeX{}\cite{TeX-book} program uses an advanced
16    algorithm for breaking the lines in a paragraph.
17    This algorithm is based on work done by Michael
18    Plass\cite{Breaklines} and Donald Knuth in 1981.
19  \end{refsection}

20  \section{\LaTeX}
21  \begin{refsection}
22    \LaTeX\cite{LaTeX2} is an extension of
23    \TeX\cite{TeX-book} programmed in \TeX{} itself.
24  \end{refsection}

25  \printbibliography[section=1,title=Bibliography on Introduction]
26  \printbibliography[section=2,title=Bibliography on \LaTeX]
27  \end{document}
```

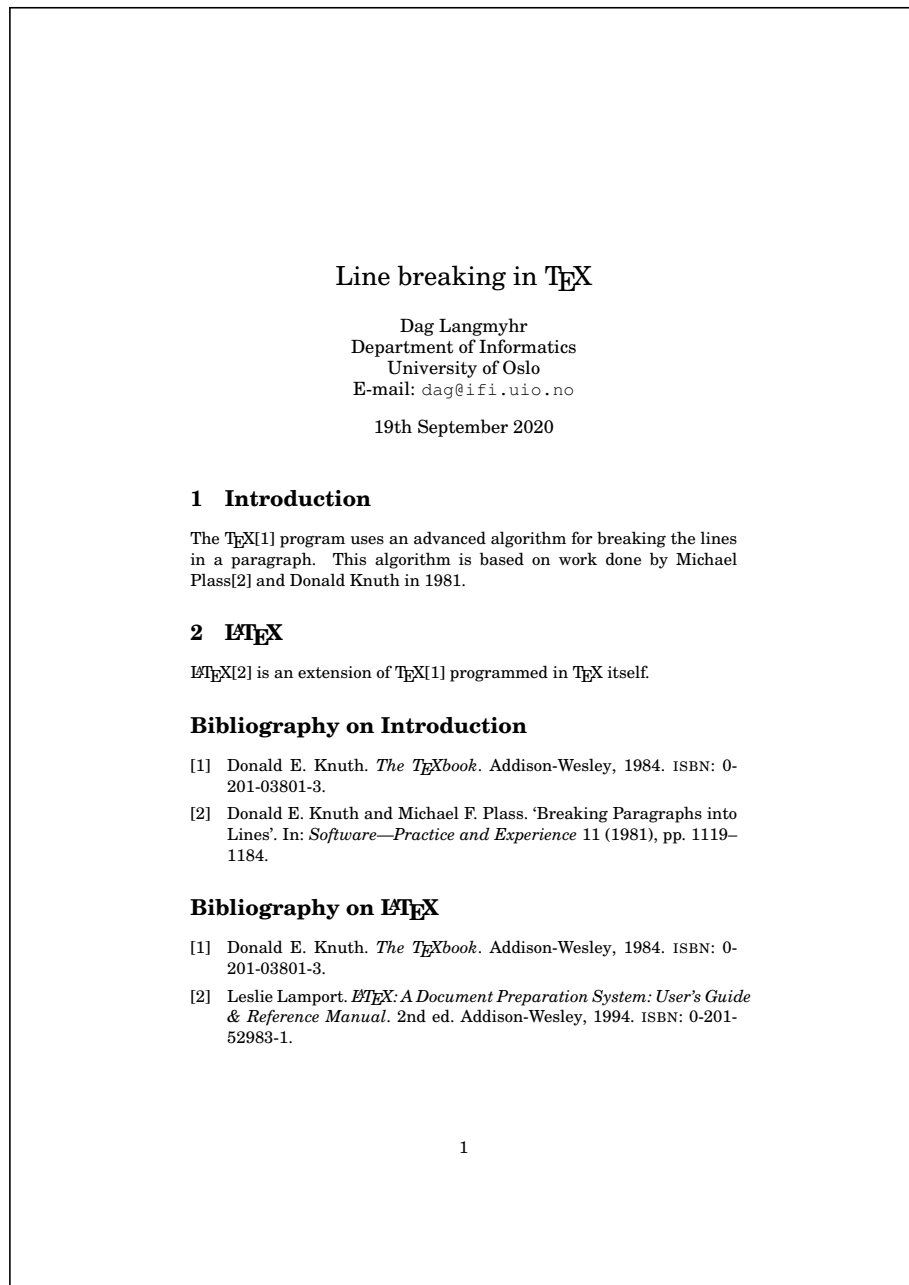**Figure 5.5:** A LaTeX document with all chapter bibliographies at the end

Line breaking in TeX

Dag Langmyhr
Department of Informatics
University of Oslo
E-mail: dag@ifi.uio.no

19th September 2020

1   Introduction

The TeX[1] program uses an advanced algorithm for breaking the lines in a paragraph. This algorithm is based on work done by Michael Plass[2] and Donald Knuth in 1981.

2   LaTeX

LaTeX[2] is an extension of TeX[1] programmed in TeX itself.

Bibliography on Introduction

[1] Donald E. Knuth. *The TeXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

[2] Donald E. Knuth and Michael F. Plass. 'Breaking Paragraphs into Lines'. In: *Software—Practice and Experience* 11 (1981), pp. 1119–1184.

Bibliography on LaTeX

[1] Donald E. Knuth. *The TeXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

[2] Leslie Lamport. *LaTeX: A Document Preparation System: User's Guide & Reference Manual*. 2nd ed. Addison-Wesley, 1994. ISBN: 0-201-52983-1.

1

Figure 5.6: The document generated from Figure 5.5

Chapter **6**

Running auxiliary programs

The biblatex package needs an auxiliary program to extract the cited references and sort the bibliography.[1] There are three such programs available today: biber, bibtex8 and bibtex. We strongly recommend using biber.

6.1 **biber**

To run biber, just specify the LaTeX file name, but without the file name suffix:

```
$ biber demo
```

Strange error messages When you run biber, you may from time to time get a strange error message looking somewhat like this:[2]

```
data source /tmp/par-646167/cache-82c7f501665b9f7e6920cd874f05fd560290894b/
/inc/lib/Biber/LaTeX/recode_data.xml not found in .
```

If that happens, just delete the folder:[3]

```
$ rm -rf /tmp/par-*
```

6.2 **bibtex**

This program is the original BibTeX processor. It has the advantage of being part of every LaTeX installation, but it has the severe disadvantage that it is

---

[1] The TeX engine which is the core of a LaTeX implementation does provide a programming language, but this language is poorly suited for this kind of task. An implementation in TeX would have been slow and also have capacity problems with large bibliographies.

[2] The reason you get this error message is that biber is written in Perl and it installs its own Perl interpreter in /tmp; that is why it takes a tad longer to run biber the first time.

[3] The folder /tmp/par-... may be called something else on other systems than Linux; delete the folder named in the error message.

restricted to the Ascii character set. This means that it cannot read files in Utf-8 encoding, nor can it handle letters like ÆØÅ properly. Use this program only as a last resort.

To run bibtex, just specify the LATEX file name without the file name suffix:

```
$ bibtex demo
```

6.3 **bibtex8**

This program was implemented to remedy the worst defects of bibtex; thus, it can read Latin-1 files (but not Utf-8 files) and it handles letters like ÆØÅ properly.

To run bibtex8, you must specify the CS file, memory size (always use --wolfgang[4] which is the maximum) and the LATEX file name (without the suffix):

```
$ bibtex8 --csfile CSfile --wolfgang demo
```

(The CS ("code page and sort order") file provides information on all the letters in the chosen language and how text is sorted. If you implement bibtex8 on your home computer, and you want to sort Norwegian names, you have to specify a suitable CS file, or you may e-mail the authors for a copy.)

> ### Note
> The bibtex8 program is very fussy about line separators and will give strange error messages about
>
>   I was expecting an "="
>
> if you have Windows separators (CR+LF) in a Linux file.

---

[4] We don't know who this *Wolfgang* is, but the documentation says that the option was "required for Wolfgang's PhD thesis".

Chapter 7

Miscellaneous

7.1 Character encodings

There are still several character encodings being used, and mixing them frequently causes problems. Fortunately, the combination of BibLaTeX and biber can handle the two most common ones in the Western world: Iso Latin-1 and Utf-8.

If the LaTeX source file and the bib file use the same encoding, BibLaTeX will have no problems. It will know the encoding of the LaTeX file because of the \usepackage[utf8]{inputenc} specification and will assume that the bib file uses the same.

When the character encodings differ, however, BibLaTeX will need to be informed of the alternate encoding of the bib file:

```
\usepackage[backend=biber,bibencoding=utf8,...]{biblatex}
\usepackage[backend=biber,bibencoding=latin1,...]{biblatex}
```

7.2 Another bibliography example

In case you are interested, here in Figures 7.1 to 7.2 on pages 32–33 is the bibliography file used in this guide.

```
_____ guide.bib _____
% -*- coding: utf-8 -*-

@manual{biblatex,
  author =        {Philipp Lehman},
  title =         {The {Bib\LaTeX} Package},
  subtitle =      {Programmable Bibliographies and Citations},
  edition =       {3.2},
  year =          2015,
  url = {http://mirrors.ctan.org/macros/latex/contrib/biblatex/doc/biblatex.pdf},
  urldate =       {2016-02-09},
}

@online{bibtex8,
  title =         {bibtex8bit --- A fully 8-bit adaptation of BibTeX 0.99},
  author =        {Niel Kempson},
  url = {http://www.ctan.org/tex-archive/biblio/bibtex/8-bit},
  urldate =       {2012-12-21}}

@online{biber,
  title =         {biber --- A BibTeX replacement for users of biblatex},
  author =        {Philip Kime and François Charette},
  version =       "2.3",
  year =          2015,
  url = "http://www.ctan.org/tex-archive/biblio/biber",
  urldate =       {2016-02-09}}

@article{Breaklines,
  author =        {Donald E. Knuth and Michael F. Plass},
  title =         {Breaking Paragraphs into Lines},
  journaltitle = {Software---Practice and Experience},
  volume =        11,
  year =          1981,
  pages =         {1119-1184}
}

@book{TeX-book,
  author =        {Donald E. Knuth},
  title =         {The {\TeX}book},
  publisher =     {Addison-Wesley},
  year =          1984,
  isbn =          "0-201-03801-3"
}

@book{LaTeX2,
  author =        {Leslie Lamport},
  title =         {{\LaTeX}: A Document Preparation System: User's
                   Guide & Reference Manual},
  publisher =     {Addison-Wesley},
  year =          1994,
  edition =       2,
  isbn =          "0-201-52983-1"
}

@reference{apa6,
  title =         "Publication Manual of the
                   {American Psychological Association}",
  publisher =     "American Psychological Association",
  year =          2009,
  version =       6,
  isbn =          "978-1433805592"
}

@online{biblatex-apa,
  title =         "{APA Bib\LaTeX{} style}",
  author =        "Philip Kime",
  version =       "9.14",
  date =          "2020-08-28",
  url =           "https://www.ctan.org/pkg/biblatex-apa",
  urldate =       "2020-09-14"
}
```

Figure 7.1: An example bibliography file (part 1)

```
──────────────────────────────┌ ...continued ┐──────────────────────────────
@reference{chicago,
  title =         "The {C}hicago manual of style",
  publisher =     "The University of {C}hicago press",
  edition =       16,
  month =         aug,
  year =          2010,
  isbn =          "978-0226104201"
}

@online{biblatex-chicago,
  title =         "The biblatex-chicago package",
  author =        "David Fussner",
  version =       "2.0",
  date =          "2020-04-21",
  url = "https://www.ctan.org/pkg/biblatex-chicago",
  urldate =       "2020-09-14"
}

@online{biblatex-vancouver,
  title =         "The biblatex-vancouver package",
  author =        "Agnibho Mondal",
  version =       "0.1",
  date =          "2020-05-20",
  url =           "https://www.ctan.org/pkg/biblatex-vancouver",
  urldate =       "2020-09-14"
}

@book{vancouver,
  title =         "Citing Medicine",
  subtitle =      "The {NLM} Style Guide for Authors, Editors, and Publishers",
  editor =        "Karen Patrias and Dan Wendling",
  edition =       2,
  publisher =     "National Library of Medicine ({US})",
  year =          2015,
  month =         oct,
  url =           "https://www.ncbi.nlm.nih.gov/books/NBK7256/?amp=&depth=2",
  urldate =       "2020-09-16"
}
```

Figure 7.2: An example bibliography file (part 2)

Bibliography

[1]   David Fussner. *The biblatex-chicago package*. Version 2.0. 21st Apr. 2020. URL: https://www.ctan.org/pkg/biblatex-chicago (visited on 14/09/2020).

[2]   Philip Kime. *APA BibLATEX style*. Version 9.14. 28th Aug. 2020. URL: https://www.ctan.org/pkg/biblatex-apa (visited on 14/09/2020).

[3]   Philip Kime and François Charette. *biber — A BibTeX replacement for users of biblatex*. Version 2.3. 2015. URL: http://www.ctan.org/tex-archive/biblio/biber (visited on 09/02/2016).

[4]   Donald E. Knuth. *The TEXbook*. Addison-Wesley, 1984. ISBN: 0-201-03801-3.

[5]   Philipp Lehman. *The BibLATEX Package. Programmable Bibliographies and Citations*. 3.2. 2015. URL: http://mirrors.ctan.org/macros/latex/contrib/biblatex/doc/biblatex.pdf (visited on 09/02/2016).

[6]   Agnibho Mondal. *The biblatex-vancouver package*. Version 0.1. 20th May 2020. URL: https://www.ctan.org/pkg/biblatex-vancouver (visited on 14/09/2020).

[7]   Karen Patrias and Dan Wendling, eds. *Citing Medicine. The NLM Style Guide for Authors, Editors, and Publishers*. 2nd ed. National Library of Medicine (US), Oct. 2015. URL: https://www.ncbi.nlm.nih.gov/books/NBK7256/?amp=&depth=2 (visited on 16/09/2020).

[8]   *Publication Manual of the American Psychological Association*. American Psychological Association, 2009. ISBN: 978-1433805592.

[9]   *The Chicago manual of style*. 16th ed. The University of Chicago press, Aug. 2010. ISBN: 978-0226104201.

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