

Лабораторная работа №6

Работа с библиографией в LaTeX natbib и biblatex

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Цель работы

Основная цель

Изучить работу систем библиографии **natbib** и **biblatex**,
освоить полный цикл генерации ссылок через **BibTeX** и **Biber**,
добавлять новые записи в **.bib** и анализировать корректность ссылок.

Работа с natbib

Первичная компиляция

Выполнена команда:

`pdflatex biblio1.tex`

```
PS C:\WINDOWS\System32> cd C:\Users\sidra\Desktop
PS C:\Users\sidra\Desktop> notepad references.bib
PS C:\Users\sidra\Desktop> notepad biblio1.tex
PS C:\Users\sidra\Desktop> notepad biblio1.tex
PS C:\Users\sidra\Desktop> pdflatex biblio1.tex
This is pdfTeX, Version 3.141592653-2.6-1.40.28 (TeX Live 2025) (preloaded format=pdflatex)
 restricted \write18 enabled.
entering extended mode
./biblio1.tex
LaTeX2e <2025-06-01> patch level 1
L3 programming layer <2025-09-02>
(c:/texlive/2025/texmf-dist/tex/latex/base/article.cls
Document Class: article 2025/01/22 v1.4n Standard LaTeX document class
(c:/texlive/2025/texmf-dist/tex/latex/base/size10.clo)
(c:/texlive/2025/texmf-dist/tex/latex/base/fontenc.sty)
(c:/texlive/2025/texmf-dist/tex/latex/natbib/natbib.sty)
(c:/texlive/2025/texmf-dist/tex/latex/l3backend/l3backend-pdftex.def)
No file biblio1.aux.

Package natbib Warning: Citation 'Thomas2008' on page 1 undefined on input line
9.
```

Рис. 1: Первая компиляция natbib

Запуск BibTeX

bibtex biblio1

```
Package natbib Warning: Citation 'Thomas2008' on page 1 undefined on input line
9.

Package natbib Warning: Citation 'Graham1995' on page 1 undefined on input line
11.

(./biblio1.bbl)

Package natbib Warning: There were undefined citations.

[1{c:/texlive/2025/texmf-var/fonts/map/pdftex/updmap/pdftex.map}]
(./biblio1.aux

Package natbib Warning: Citation(s) may have changed.
(natbib)                    Rerun to get citations correct.

) ) <c:/Users/sidra/.texlive2025/texmf-var/fonts/pk/ljfour/jknappen/ec/ecti1000
.600pk> <c:/Users/sidra/.texlive2025/texmf-var/fonts/pk/ljfour/jknappen/ec/ecbx
1000.600pk> <c:/Users/sidra/.texlive2025/texmf-var/fonts/pk/ljfour/jknappen/ec/
ecrm1000.600pk> <c:/Users/sidra/.texlive2025/texmf-var/fonts/pk/ljfour/jknappen
/ec/ecbx1440.600pk>
Output written on biblio1.pdf (1 page, 28994 bytes).
Transcript written on biblio1.log.
PS C:\Users\sidra\Desktop> pdflatex biblio1.tex
```

Рис. 2: Запуск BibTeX

Повторная компиляция

```
pdflatex bibliol.tex  
pdflatex bibliol.tex
```

```
PS C:\Users\sidra\Desktop> pdflatex bibliol.tex  
This is pdfTeX, Version 3.141592653-2.6-1.40.28 (TeX Live 2025) (preloaded format=pdflatex)  
 restricted \write18 enabled.  
entering extended mode  
./biblio1.tex  
LaTeX2e <2025-06-01> patch level 1  
L3 programming layer <2025-09-02>  
(c:/texlive/2025/texmf-dist/tex/latex/base/article.cls  
Document Class: article 2025/01/22 v1.4n Standard LaTeX document class  
(c:/texlive/2025/texmf-dist/tex/latex/base/size10.clo)  
(c:/texlive/2025/texmf-dist/tex/latex/base/Fontenc.sty)  
(c:/texlive/2025/texmf-dist/tex/latex/natbib/natbib.sty)  
(c:/texlive/2025/texmf-dist/tex/latex/l3backend/l3backend-pdftex.def)  
(./biblio1.aux) (./biblio1.bbl)  
[1{c:/texlive/2025/texmf-var/fonts/map/pdftex/updmap/pdftex.map}]  
(./biblio1.aux) ) <c:/Users/sidra/.texlive2025/texmf-var/fonts/pk/ljfour/jknapp  
en/ec/ecti1000.600pk > <c:/Users/sidra/.texlive2025/texmf-var/fonts/pk/ljfour/jk  
nappen/ec/ecrm1000.600pk <c:/Users/sidra/.texlive2025/texmf-var/fonts/pk/ljfour/  
r/jknappen/ec/ecbx1440.600pk>  
Output written on bibliol.pdf (1 page, 28610 bytes).  
Transcript written on bibliol.log.
```

Рис. 3: Обновление ссылок

Результат natbib

Готовый PDF содержит:

- числовые ссылки ([1], [2]);
- раздел *References*;
- корректные авторо-дата ссылки.

1 Test Bibliographie

Citation : [2].

Autre citation : [1].

References

- [1] Ronald L. Graham, Donald E. Knuth, and Oren Patashnik. *Concrete Mathematics*. Addison-Wesley, 1995.
- [2] Christine M. Thomas, Tianbiao Liu, Michael B. Hall, and Marcetta Y. Darenbourg. Series of mixed valent Fe(II)Fe(I) complexes. *Inorg. Chem.*, 47:7009–7024, 2008.

Пример natbib_example

Первая компиляция

```
pdflatex natbib_example.tex
```

```
PS C:\Users\sidra\Desktop> pdflatex natbib_example.tex
This is pdfTeX, Version 3.141592653-2.6-1.40.28 (TeX Live 2025) (preloaded format=pdflatex)
restricted \write18 enabled.
entering extended mode
./natbib_example.tex
LaTeX2e <2025-06-01> patch level 1
L3 programming layer <2025-09-02>
(c:/texlive/2025/texmf-dist/tex/latex/base/article.cls
Document Class: article 2025/01/22 v1.4n Standard LaTeX document class
(c:/texlive/2025/texmf-dist/tex/latex/base/size10.clo))
(c:/texlive/2025/texmf-dist/tex/latex/base/fontenc.sty)
(c:/texlive/2025/texmf-dist/tex/latex/natbib/natbib.sty)
(c:/texlive/2025/texmf-dist/tex/latex/l3backend/l3backend-pdftex.def)
No file natbib_example.aux.

Package natbib Warning: Citation 'Graham1995' on page 1 undefined on input line
6.

Package natbib Warning: Citation 'Thomas2008' on page 1 undefined on input line
6.

Package natbib Warning: Citation 'Graham1995' on page 1 undefined on input line
8.

Package natbib Warning: Citation 'Thomas2008' on page 1 undefined on input line
8.
```

Рис. 5: Компиляция natbib_example

Работа с biblatex

Первая компиляция

```
pdflatex biblatex_example.tex
```

```
PS C:\Users\sidra\Desktop> notepad biblatex_example.tex
PS C:\Users\sidra\Desktop> pdflatex biblatex_example.tex
This is pdfTeX, Version 3.141592653-2.6-1.40.28 (TeX Live 2025) (preloaded format=pdflatex)
  restricted \write18 enabled.
entering extended mode
./biblatex_example.tex
LaTeX2e <2025-06-01> patch level 1
L3 programming layer <2025-09-02>
(c:/texlive/2025/texmf-dist/tex/latex/base/article.cls
 Document Class: article 2025/01/22 v1.4n Standard LaTeX document class
(c:/texlive/2025/texmf-dist/tex/latex/base/size10.clo))
(c:/texlive/2025/texmf-dist/tex/latex/base/fontenc.sty)
(c:/texlive/2025/texmf-dist/tex/latex/biblatex/biblatex.sty
(c:/texlive/2025/texmf-dist/tex/generic/pdftexcmds/pdftexcmds.sty
(c:/texlive/2025/texmf-dist/tex/generic/infwarerr/infwarerr.sty)
(c:/texlive/2025/texmf-dist/tex/generic/iftex/iftex.sty)
(c:/texlive/2025/texmf-dist/tex/generic/ltxcmds/ltxcmds.sty))
(c:/texlive/2025/texmf-dist/tex/latex/etoolbox/etoolbox.sty)
(c:/texlive/2025/texmf-dist/tex/latex/graphics/keyval.sty)
```

Рис. 6: Первая компиляция biblatex

Запуск Biber

biber biblatex_example

```
PS C:\Users\sidra\Desktop> biber biblatex_example
INFO - This is Biber 2.21
INFO - Logfile is 'biblatex_example.blg'
INFO - Reading 'biblatex_example.bcf'
INFO - Found 2 citekeys in bib section 0
INFO - Processing section 0
INFO - Looking for bibtex file 'references.bib' for section 0
INFO - LaTeX decoding ...
INFO - Found BibTeX data source 'references.bib'
INFO - Overriding locale 'en-US' defaults 'variable = shifted' with 'variable = non-ignorable'
INFO - Overriding locale 'en-US' defaults 'normalization = NFD' with 'normalization = prenormalized'
INFO - Sorting list 'nyt/global//global/global/global' of type 'entry' with template 'nyt' and locale 'en-US'
INFO - No sort tailoring available for locale 'en-US'
INFO - Writing 'biblatex_example.bbl' with encoding 'UTF-8'
INFO - Output to biblatex_example.bbl
PS C:\Users\sidra\Desktop> pdflatex biblatex_example.tex
This is pdfTeX, Version 3.141592653-2.6-1.40.28 (TeX Live 2025) (preloaded format=pdflatex)
restricted \write18 enabled.
entering extended mode
(./biblatex_example.tex
LaTeX2e <2025-06-01> patch level 1
L3 programming layer <2025-09-02>
(c:/texlive/2025/texmf-dist/tex/latex/base/article.cls
Document Class: article 2025/01/22 v1.4n Standard LaTeX document class
(c:/texlive/2025/texmf-dist/tex/latex/base/size10.clo)
(c:/texlive/2025/texmf-dist/tex/latex/base/fontenc.sty)
(c:/texlive/2025/texmf-dist/tex/latex/biblatex/biblatex.sty)
```

Рис. 7: Запуск Biber

Обновление PDF

```
pdflatex biblatex_example.tex  
pdflatex biblatex_example.tex
```

```
PS C:\Users\sidra\Desktop> pdflatex biblatex_example.tex  
This is pdfTeX, Version 3.141592653-2.6-1.40.28 (TeX Live 2025) (preloaded format=pdflatex)  
 restricted \write18 enabled.  
entering extended mode  
(./biblatex_example.tex  
LaTeX2e <2025-06-01> patch level 1  
L3 programming layer <2025-09-02>  
(c:/texlive/2025/texmf-dist/tex/latex/base/article.cls  
Document Class: article 2025/01/22 v1.4n Standard LaTeX document class  
(c:/texlive/2025/texmf-dist/tex/latex/base/size10.clo)  
(c:/texlive/2025/texmf-dist/tex/latex/base/fontenc.sty)  
(c:/texlive/2025/texmf-dist/tex/latex/biblatex/biblatex.sty  
(c:/texlive/2025/texmf-dist/tex/generic/pdftexcmds/pdftexcmds.sty  
(c:/texlive/2025/texmf-dist/tex/generic/infwarerr/infwarerr.sty)  
(c:/texlive/2025/texmf-dist/tex/generic/iftex/iftex.sty)  
(c:/texlive/2025/texmf-dist/tex/generic/ltxcmds/ltxcmds.sty))  
(c:/texlive/2025/texmf-dist/tex/latex/etoolbox/etoolbox.sty)  
(c:/texlive/2025/texmf-dist/tex/latex/graphics/keyval.sty)  
(c:/texlive/2025/texmf-dist/tex/latex/kvoptions/kvoptions.sty  
(c:/texlive/2025/texmf-dist/tex/latex/kvsetkeys/kvsetkeys.sty))  
(c:/texlive/2025/texmf-dist/tex/latex/logreq/logreq.sty  
(c:/texlive/2025/texmf-dist/tex/latex/logreq/logreq.logreq.def))  
(c:/texlive/2025/texmf-dist/tex/latex/base/ifthen.sty)
```

Рис. 8: Обновлённый PDF biblatex

Результат biblatex

Используется стиль *authoryear*, ссылки форматируются иначе, чем в natbib.

```
PS C:\Users\sidra\Desktop>
PS C:\Users\sidra\Desktop> notepad biblatex_numeric.tex
PS C:\Users\sidra\Desktop> pdflatex biblatex_numeric.tex
This is pdfTeX, Version 3.141592653-2.6-1.40.28 (TeX Live 2025) (preloaded format=pdflatex)
 restricted \write18 enabled.
entering extended mode
./biblatex_numeric.tex
LaTeX2e <2025-06-01> patch level 1
L3 programming layer <2025-09-02>
(c:/texlive/2025/texmf-dist/tex/latex/base/article.cls
 Document Class: article 2025/01/22 v1.4n Standard LaTeX document class
(c:/texlive/2025/texmf-dist/tex/latex/base/size10.clo))
(c:/texlive/2025/texmf-dist/tex/latex/base/fontenc.sty)
(c:/texlive/2025/texmf-dist/tex/latex/biblatex/biblatex.sty
(c:/texlive/2025/texmf-dist/tex/generic/pdftrrcmds/pdftrrcmds.sty
(c:/texlive/2025/texmf-dist/tex/generic/infwarerr/infwarerr.sty)
(c:/texlive/2025/texmf-dist/tex/generic/iftex/iftex.sty)
(c:/texlive/2025/texmf-dist/tex/generic/ltxcmds/ltxcmds.sty)
(c:/texlive/2025/texmf-dist/tex/latex/etoolbox/etoolbox.sty)
```

Рис. 9: Пример стиля biblatex

biblatex – стиль numeric

Компиляция numeric-версии

```
pdflatex biblatex_numeric.tex  
biber biblatex_numeric  
pdflatex biblatex_numeric.tex  
pdflatex biblatex_numeric.tex
```

```
) <c:/Users/sidra/.texlive2025/texmf-var/fonts/pk/ljfour/jknappen/ec/ecbx1000.  
600pk> <c:/Users/sidra/.texlive2025/texmf-var/fonts/pk/ljfour/jknappen/ec/ecrml  
000.600pk>  
Output written on biblatex_numeric.pdf (1 page, 9895 bytes).  
Transcript written on biblatex_numeric.log.  
PS C:\Users\sidra\Desktop> biber biblatex_numeric  
INFO - This is Biber 2.21  
INFO - Logfile is 'biblatex_numeric.blg'  
INFO - Reading 'biblatex_numeric.bcf'  
INFO - Found 2 citekeys in bib section 0  
INFO - Processing section 0  
INFO - Looking for bibtex file 'references.bib' for section 0  
INFO - LaTeX decoding ...  
INFO - Found BibTeX data source 'references.bib'  
INFO - Overriding locale 'en-US' defaults 'variable = shifted' with 'variable = non-ignorable'  
INFO - Overriding locale 'en-US' defaults 'normalization = NFD' with 'normalization = prenormalized'  
INFO - Sorting list 'nty/global//global/global/global' of type 'entry' with template 'nty' and locale 'en-US'  
INFO - No sort tailoring available for locale 'en-US'  
INFO - Writing 'biblatex_numeric.bbl' with encoding 'UTF-8'  
INFO - Output to biblatex_numeric.bbl  
PS C:\Users\sidra\Desktop> pdflatex biblatex_numeric.tex  
This is pdfTeX, Version 3.141592653-2.6-1.40.28 (TeX Live 2025) (preloaded format=pdflatex)  
restricted \write18 enabled.  
entering extended mode  
(./biblatex_numeric.tex  
LaTeX2e <2025-06-01> patch level 1  
L3 programming layer <2025-09-02>  
(c:/texlive/2025/texmf-dist/tex/latex/base/article.cls  
Document Class: article 2025/01/22 v1.4n Standard LaTeX document class  
(c:/texlive/2025/texmf-dist/tex/latex/base/size10.clo)  
(c:/texlive/2025/texmf-dist/tex/latex/base/fontenc.sty)  
(c:/texlive/2025/texmf-dist/tex/latex/biblatex/biblatex.sty
```

Формат:

[2] и [1]

The mathematics showcase is from (Graham, Knuth, and Patashnik 1995).
Some more complex citations: (Graham, Knuth, and Patashnik 1995) or
Thomas et al. (2008) or possibly *Concrete Mathematics*.
(Thomas et al. 2008, p. 56)
(See Graham, Knuth, and Patashnik 1995, pp. 45–48)
Together (Thomas et al. 2008; Graham, Knuth, and Patashnik 1995)

References

- Graham, Ronald L., Donald E. Knuth, and Oren Patashnik (1995). *Concrete Mathematics*. Addison-Wesley.
Thomas, Christine M. et al. (2008). “Series of Mixed Valent Fe(II)Fe(I) Complexes”. In: *Inorg. Chem.* 47, pp. 7009–7024.

Ошибка ссылок

Добавлена ссылка, отсутствующая в базе данных.

The mathematics showcase is from ?, whereas there is some chemistry in ?.
Some parenthetical citations: (?) and then (? , p. 56).
(See ?, pp. 45–48)
Together (??)

Рис. 11: Некорректные ссылки

Сравнение систем

- использует BibTeX
- цикл: *LaTeX* → *BibTeX* → *LaTeX* → *LaTeX*
- стиль numeric через: `\usepackage[numbers]{natbib}`
- отсутствующие ссылки → ?

- использует **Biber**
- цикл: *LaTeX* → *Biber* → *LaTeX* → *LaTeX*
- стиль numeric через: `\usepackage[style=numeric]{biblatex}`
- более гибкая настройка форматов

Выводы

В ходе лабораторной работы были освоены:

- компиляция документа с использованием **natbib** и **biblatex**;
- работа с **BibTeX** и **Biber**;
- добавление новых записей в **.bib**;
- анализ корректных и отсутствующих цитат;
- сравнение стилей выводов ссылок, включая **numeric**.