

# Program and package xindex

—  
0.21 (May 29, 2020)

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May 29, 2020

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Thanks to:  
Mark Baudoin; Heiko Oberdiek; Matteo Paolini

## 1 Introduction

The Lua program `xindex` is a unicode aware program for creating an index file from an `.idx` source file. It is completely compatible to the current `makeindex` program, but can handle UTF-8, 16, 32, and 64. The  $\text{\LaTeX}$  package `xindex` is a package which provides a  $\text{\LaTeX}$  command which writes additional text into the index file. This text (comments and/or macros) will be accepted by the program `xindex`.

The general structure of a data element in the Lua table is:

```
data = { Entry = <text>, -- like the input line without command \indexentry
        pages = {
            { number = <roman/arabic number or text>,
              special = <macro> }, -- the part after | in the input
            [...]
            { number = <roman/arabic number or text>,
              special = <macro> }
        },
        sortChar = <unicode codepoint>, -- of the first character of Entry
        Macro     = <TeX macro> -- only useful with LaTeX package \Lpack{xindex}
    }
```

After reading the input file the table `pages` has only one element for the number and the so-called special command. When the pages are compressed the table will collect all pages which refer to the same entry name.

### 1.1 Syntax

The syntax is `xindex [...] <file>` where `[...]` are optional arguments, either in short or long form which, of course, can be mixed:

```
xindex
  [-q,--quiet ]
  [-h,--help ]
  [-v ]                verbose
  [-c,--config ]       default is cfg
  [-e,--escapechar ]   default is "
  [-a, --nocasesensitive ] default is false
  [-n,--noheadings ]   default is false
  [-o,--output ]       default is <input>.ind
  [-l,--language ]     default is en
  [-p,--prefix]        default L
  <input file>
```

The language has to be chosen as an international abbreviation in lower- or uppercase letters, see [https://en.wikipedia.org/wiki/ISO\\_3166-2](https://en.wikipedia.org/wiki/ISO_3166-2)

## 1.2 How it works

xindex creates by default an output file <input>.ind which can be read by the  $\LaTeX$  document with the default command `\printindex`. One can use another output filename, which makes only sense if one doesn't use the `\printindex` command for typesetting the index. The default sorting is given by the configuration file, which defines replacements for accented characters, like  $\ddot{o} \rightarrow \text{o}$ .

## 1.3 The .idx file

There are four characters which must be escaped if used in the command `\index`: `!`, `@`, `"`, or `|`. These characters have a special meaning for the index. The default escape character is the double quote `"`:

```
\usepackage{makeidx}\makeindex
```

```
\section{Escaping characters}
\begin{itemize}
\item Exclamation mark ! \index{exclaim ("!)}
\item Vertical bar| \index{Vertical bar ("|)}
\item Doublequote \verb|"| \index{""}
\item Double doublequote \verb|""| \index{""""}
\item At character @ \index{At ("@)}
\end{itemize}
run \texttt{xindex <file.idx>}\index{<file.idx>}\index{123}
\newpage
\printindex
```

index-1

### 1 Escaping characters

- Exclamation mark `!`
- Vertical bar `|`
- Doublequote `"`
- Double doublequote `""`
- At character `@`

```
run xindex <file.idx>
```

### Index

#### Symbols

`"`, 1  
`""`, 1  
`<file.idx>`, 1

#### Numbers

123, 1

#### A

At (`@`), 1

#### E

exclaim (`!`), 1

#### V

Vertical bar (`|`), 1

For the german language the double quote is an active character and it makes live easier if one chooses another character. The escape character can be changed easily by the optional argument `-e "<char>"` or `--escapechar "<char>"`. The following example shows how it works for the escape character `>` (greater). Internally the escape sequences are now defined as:

2 Language

```
escape_chars = { -- by default " is the escape char
  {esc_char..'\'', '//escapedquote//', '\\\"{}' },
  {esc_char..'@', '//escapedat//', '@' },
  {esc_char..'\'', '//escapedvert//', "|\" },
  {esc_char..'!', '//scapedexcl//', '!\" }
}
```

which is, of course, not of interest for the user. With the beginning the escaped chars are converted into the internal strings and later back to the origin meaning.

```
\usepackage{makeidx}\makeindex
```

xindex-2

```
\section{Escaping characters with >}
\begin{itemize}
\item Exclamation mark ! \index{exclaim (>!) }
\item Vertical bar| \index{Vertical bar (>|) }
\item Doublequote \verb|"| \index{>}
\item Double doublequote \verb|""| \index{>">}
\item At character @ \index{At (>@) }
\end{itemize}
Run \texttt{xindex} with \texttt{xindex -e ">"}\index{<file.idx>}\index{123}
\newpage
\printindex
```

1 Escaping characters with >

- Exclamation mark !
- Vertical bar|
- Doublequote "
- Double doublequote ""
- At character @

Run xindex with xindex -e ">"

Index

Symbols

“, 1

“, 1

<file.idx(, 1

Numbers

123, 1

A

At (@), 1

E

exclaim (!), 1

V

Vertical bar (|), 1

2 Language

The language is only important for the first two headers in the output of the index data. They are by default *Symbols* followed by *Numbers*. In a new version of xindex it will be customizable. The predefined language is »en« and currently the following languages are possible:

```

indexheader = {
  de = {"Symbole", "Zahlen"},
  en = {"Symbols", "Numbers"},
  fr = {"Symboles", "Chiffre"},
  it = {"Simboli", "Numeri"},
  jp = {"シンボル", "番号"},
}

```

The following example was run with `xindex -l it <file>.idx`:

```

\usepackage{makeidx}\makeindex

\section{Escaping characters with >}
\begin{itemize}
\item Exclamation mark ! \index{exclaim (>!)}
\item Vertical bar| \index{Vertical bar (>|)}
\item Doublequote \verb|"| \index{>}
\item Double doublequote \verb|""| \index{>">}
\item At character @ \index{At (>@)}
\end{itemize}
Run \texttt{xindex} with \texttt{xindex -l it -e ">"}\index{123}
\newpage
\printindex

```

xindex-3

### 1 Escaping characters with >

- Exclamation mark !
- Vertical bar|
- Doublequote "
- Double doublequote ""
- At character @

Run `xindex` with `xindex -l it -e ">"`

### Index

#### Simboli

!, 1  
", 1

#### Numeri

123, 1

#### A

At (@), 1

#### E

exclaim (!), 1

#### V

Vertical bar (|), 1

## 3 Sorting

The default sorting is unicode aware and uses a translation table for accented characters:

```

alphabet_lower = { -- for sorting
  { ' ' }, -- only for internal tests
  { 'a', 'á', 'à', 'ä' },

```

### 3 Sorting

```
{ 'b' },
{ 'c' },
{ 'd' },
{ 'e', 'é', 'è', 'ë' },
{ 'f' },
{ 'g' },
{ 'h' },
{ 'i', 'í', 'ì', 'ï' },
{ 'j' },
{ 'k' },
{ 'l' },
{ 'm' },
{ 'n', 'ñ' },
{ 'o', 'ó', 'ò', 'ö' },
{ 'p' },
{ 'q' },
{ 'r' },
{ 's' },
{ 't' },
{ 'u', 'ú', 'ù', 'ü' },
{ 'v' },
{ 'w' },
{ 'x' },
{ 'y' },
{ 'z' }
}
```

There is also a table for the uppercase letters. If it should be edited or extended then copy first the base configuration file `xindex-cfg.lua` and modify that new file. It can be used by `xindex` with the optional argument `-c newfile` if it is named as `xindex-newfile.lua`. For german there already exists a configuration file `xindex-DIN2.lua` which uses the so-called »Telefonbuchsortierung« which converts the umlauts like `ö→oe`:

```
alphabet_upper = { -- for sorting
  { ' ' },
  { 'A', 'Á', 'À', 'Ä' },
  { 'B' },
  { 'C' },
  { 'D' },
  { 'E', 'È', 'É', 'ë' },
  { 'F' },
  { 'G' },
  { 'H' },
  { 'I', 'Í', 'Ì', 'ï' },
  { 'J' },
  { 'K' },
  { 'L' },
```

```

{ 'M' },
{ 'N', 'Ñ' },
{ 'O', 'Ó', 'Ò', 'Ö' },
{ 'P' },
{ 'Q' },
{ 'R' },
{ 'S' },
{ 'T' },
{ 'U', 'Ú', 'Ù', 'Ü' },
{ 'V' },
{ 'W' },
{ 'X' },
{ 'Y' },
{ 'Z' }
}

```

```

\usepackage{makeidx}\makeindex
\newcommand\Index[1]{\index{#1}#1}

```

Sorted with `\verb|-l DE|`

```

\Index{Österreich} \Index{Öresund}
\Index{Ostern} \Index{Ober}
\Index{Oberin} \Index{Österreich}
\Index{Öresund} \Index{Ostern}
\Index{Ober} \Index{Oberin}
\Index{Obstler} \Index{Öl}
\Index{ölen} \Index{Ödem}
\Index{Oligarch} \Index{Oder}
\Index{oder} \index{Fluss!Oder}
\index{Oder|seealso{Fluss}}
\Index{Göbel} \Index{Goethe}
\Index{Göthe} \Index{Götz}
\Index{Goldmann}

\printindex

```

## Index

### F

Fluss  
- Oder, 1

### G

Göbel, 1  
Goethe, 1  
Goldmann, 1  
Göthe, 1  
Götz, 1

### O

Ober, 1

Oberin, 1  
Obstler, 1  
Ödem, 1  
oder, 1  
Oder, 1, *siehe auch* Fluss  
Öl, 1  
ölen, 1  
Oligarch, 1  
Öresund, 1  
Ostern, 1  
Österreich, 1

xindex-4

The same sorted with the german DIN variant 2 with `--config DIN2`, which is part of the  $\text{\TeX}$  distribution. In this case a letter  $\ddot{O}$  is converted to *Oe* before sorting the word beginning with the letter  $\ddot{O}$ :

xindex-5

```
\usepackage{makeidx}\makeindex
\newcommand\Index[1]{\index{#1}#1}

Sorted with
\verb|--config DIN2 -l DE|

\Index{Österreich} \Index{Öresund}
\Index{Ostern} \Index{Ober}
\Index{Oberin} \Index{Österreich}
\Index{Öresund} \Index{Ostern}
\Index{Ober} \Index{Oberin}
\Index{Obstler} \Index{Öl}
\Index{ölen} \Index{Ödem}
\Index{Oligarch} \Index{Oder}
\Index{oder} \index{Fluss!Oder}
\index{Oder|seealso{Fluss}}
\Index{Göbel} \Index{Goethe}
\Index{Göthe} \Index{Götz}
\Index{Goldmann}

\printindex
```

Index

<b>F</b>	Öl, 1
Fluss	ölen, 1
- Oder, 1	Öresund, 1
<b>G</b>	Österreich, 1
Göbel, 1	Ober, 1
Goethe, 1	Oberin, 1
Göthe, 1	Obstler, 1
Götz, 1	Oder, 1
Goldmann, 1	oder, 1
<b>O</b>	Oder, <i>siehe auch</i> Fluss
Ödem, 1	Oligarch, 1
	Ostern, 1

The following runs with xindex -l jp <file>:

xindex-6

```
\usepackage{fontspec}
\setmainfont{SourceHanSans}
\usepackage[japanese]{babel}
\addto\captionsjapanese{%
\def\indexname{指数}}
\usepackage[hvindex}% for \Index
\usepackage{makeidx}\makeindex

\Index{車} \Index{車道}
日本\index{日本|fbox}
\Index{病院} \Index{コンピュータ}
\Index{プリンタ} \Index{印刷}
\Index{スイミングプール} \Index{天王}
\Index{広島} \Index{ドイツ}
\Index{日本} \Index{ワープロ}
\Index{foo} und \Index{bar}
\Index{//} \Index{4711}
\newpage\printindex
```

指数

<b>シンボル</b>	<b>ワ</b>
//, 1	ワープロ, 1
<b>番号</b>	<b>印</b>
4711, 1	印刷, 1
<b>B</b>	<b>天</b>
bar, 1	天王, 1
<b>F</b>	<b>広</b>
foo, 1	広島, 1
<b>コ</b>	<b>日</b>
コンピュータ, 1	日本, 1, <span style="border: 1px solid black; padding: 0 2px;">1</span>
<b>ス</b>	<b>病</b>
スイミングプール, 1	病院, 1
<b>ド</b>	<b>車</b>
ドイツ, 1	車, 1
<b>プ</b>	車道, 1
プリンタ, 1	



## 4 Compressing pagenumbers

By default page sequences of an entry are compressed to

**8f** page 8 and 9

**8ff** page 8, 9, and 10

**8-12** page 8, 9, ..., 12

The so-called folio abbreviation is language dependent and defined in the file `xindex-cfg-common.cfg`:

```
folium = {
  de = {"f", "ff"},
  en = {"f", "ff"},
  fr = {"\,sq", "\,sq"},
  it = {"f", "ff"},
  no = {"\,f.", "\,ff."},
  jp = {"シンボル", "番号"},
}
```

```
\usepackage{makeidx}\makeindex
```

```
Sorted with \verb|-l fr|
```

```
foobar\index{foobar|()}
foo\index{foo}\index{bar}\index{baz}\newpage
foo\index{foo}\index{bar}\index{baz}\newpage
foo\index{bar}\index{baz}\newpage
foo\index{baz}\newpage
foo\index{foo}foobar\index{foobar|)}
\newpage
\printindex
```

## Index

### B

bar, 1 sqq  
baz, 1–4

### F

foo, 1 sq, 5  
foobar, 1–5

xindex-7

## 5 hyperref

Using the package `hyperref` is no problem:

xindex-8

```

\usepackage{makeidx}\makeindex
\usepackage{hvinde}% for \Index
\usepackage[colorlinks]{hyperref}

Sorted with \verb|-l DE|
\Index{Österreich} \Index{Öresund}
\Index{Ostern} \Index{Ober} \Index{Oberin}
\Index{Österreich} \index{Öresund|textbf}
\Index{Ostern} \Index{Ober} \Index{Oberin}
\Index{Obstler} \Index{Öl} \Index{ölen}
\Index{Ödem} \Index{Oligarch} \Index{Oder}
\Index{oder} \index{Fluss!Oder|textit}
\Index{Oder|seealso{Fluss}} \Index{Göbel}
\Index{Goethe} \Index{Göthe} \Index{Götz}
\newpage\Index{Goldmann} \Index{Goethe}
\newpage \printindex

```

## Index

**F**  
 Fluss  
     - Oder, 1  
**G**  
 Göbel, 1  
 Goethe, 1f  
 Goldmann, 2  
 Göthe, 1  
 Götz, 1  
**O**  
 Ober, 1  
 Oberin, 1  
 Obstler, 1  
 Ödem, 1  
 Oder, 1  
 oder, 1  
 Oder, *see also* Fluss  
 Öl, 1  
 ölen, 1  
 Oligarch, 1  
 Öresund, 1, 1  
 Ostern, 1  
 Österreich, 1

## 6 Page argument

Every page can be combined with an additional macro, like `\index{foo|fbox}`, the page number will be set into a framebox. If we have on the same page the two commands:

```
foo\index{foo} and foo\index{foo|bar}
```

then we have two *different* index entries which will not be compressed to one entry. In the following example we have four different entries for *foo* which is the reason that we do not get an output like *foo, 1--4*. Only the first two entries are of the same type, so we get 1f in the output.

xindex-9

```

\usepackage{makeidx}\makeindex

Ein foo\index{foo} \newpage und \index{foo}
ein foo\index{foo|textit} \newpage
und foo\index{foo|textbf} \newpage
und foo\index{foo|fbox}

\newpage
\printindex

```

## Index

**F**  
 foo, 1f, 2, 3, 4

## 7 The config file

The main config file is `xindex-cfg.lua` is used by default and loading it by the optional parameter `-c` makes no sense. A new config file must have the prefix `xindex-` and the file extension `.lua`, for example: `xindex-HAdW-eK0.lua` which can be used with `--config HAdW-eK0`. The file must

be saved in the documents directory or in one which is known to kpsewhich, for example<sup>1</sup> \$TEXMFLOCAL/tex/lualatex/xindex/ Don not forgot to update the filename database.

A new config file must declare at least the variables which are part of the default config file: the translation tables and

```
itemPageDelimiter = ","      -- Hello, 14
compressPages      = true
  -- something like 12--15, instead of 12,13,14,15. the |( ... |) syntax is still valid
fCompress          = true    -- 3f -> page 3, 4 and 3ff -> page 3, 4, 5
minCompress        = 3      -- 14--17 or
rangeSymbol        = "--"
numericPage        = true    -- for non numerical pagenumbers, like "VI-17"
sublabels          = {"", "-\\-", "--\\-", "---\\-"}
  -- for the sub(sub(sub-items, first one is empty
pageNoPrefixDel     = ""     -- a delimiter for page numbers like "VI-17" -- not used !!!
indexOpening       = ""     -- commands/text after \begin{theindex}
```

The new config file can define own functions for compressing the pagelist for a given entry and for the formatting of the output. They must be called `specialCompressPageList` and `specialGetPageList`.

For example:

```
function specialCompressPageList(pages)
  if (pages[1]["number"] == "") then pages[1]["number"] = " " end
  if (#pages <= 1) then
    pages[1]["number"] = pages[1]["number"]:gsub('-',':~')-- replace "-" with ":~"
    return pages
  end -- only one pageno
  local sortPages = {}
  local roman
  local volume
  local page
  local i
  for i=1,#pages do
    roman = string.gsub(pages[i]["number"],'%U*', '') -- only uppercase to catch VII/1-123f and VII/3-123ff (folium pages)
    if romanToNumber(roman) then
      roman = string.format("%05d",tonumber(romanToNumber(roman))) -- only roman part VII
    else
      roman = ""
    end
    volume = string.gsub(pages[i]["number"],'%a*', '') -- only the number /2 123 or /2-123
    if volume then volume = volume:gsub('-', '%d*', '') end -- delete - char to get /2
    page = string.gsub(pages[i]["number"],'.*-', '')
```

---

<sup>1</sup>The directory xindex must be created before saving the file.

## 7 The config file

```

page = string.format("%5s",page)
sortPages[#sortPages+1] = {
    origin = pages[i],
    sort = roman..volume.." "..page } -- no minus between Roman/Volume and first page
end
table.sort(sortPages, function(a,b) return a["sort"] < b["sort"] end )

[...]

    return pages
end
end
end

```

is a special function which can handle page numbers like VII-17, VIII/2/1-186. Internally exists a function `compressPageList` which is used if no `specialCompressPageList` is defined.

```
\usepackage{makeidx}
```

```
\mbox{}\printindex
```

xindex-10

## Personenverzeichnis

### A

Aachen, Johannes von ..... VII/1 : 215  
 Aarones ..... VII/2/1 : 1003, 1012  
 Abrahamson ..... VII/2/1 : 864, 991, 1048, 1067, 1156  
 Adamson ..... VII/2/1 : 1223, IX/1 : 1228  
 Adrian  
   - Hauster ..... VII/1 : 514, XI/1 : 515  
 Alting  
   - Mensa ..... VII/1 : 426, 434, 453, 455, 466f.

### B

Braunschweig-Wolfenbüttel  
   - Karl Viktor von, Herzog ..... VI/1 : 83  
 Bremen  
   - Heinz von, Erzbischof ..... see Sachsen-Lauenburg

### J

Julian  
   - Apostata, römischer Kaiser ..... VII/2/1 : 904  
 Justinian I., byzantinischer Kaiser ..... VII/1 : 326, 734,  
   VII/2/1 : 1011

### K

Karl  
   - II., Kaiser ..... VII/1 : 147  
   - III., Kaiser ..... VII/1 : 149  
   - IV., Kaiser ..... VI/1 : 12, VII/1 : 34, 147  
   - V., Kaiser ..... VI/1 : 84, 284, 654, VI/2 : 708, 1014,  
     1043, 1131, 1210, VII/1 : 34  
   - VI., Kaiser ..... VII/1 : 296  
   - IX., Kaiser ..... VII/1 : 296  
   - X., Kaiser ..... VII/1 : 149  
   - der Große, Kaiser ..... VI/2 : 987, 989, 1028

### O

Osnabrück  
   - Heinz von, Bischof ..... see Sachsen-Lauenburg

### S

Schleswig-Holstein  
   - Rudolf von, Herzog ..... VII/2/1 : 758-761, 765

### Z

Zwingl, Haldrich ..... IX : 479, 692

The config file `xindex-dtk.lua` defines a special page output:

```

function specialGetPageList(v,hyperpage) -- Entry table, boolean
    local Pages = {}

```

```

[.]
if (Pages[1]["special"] == nil) or (Pages[1]["number"] == nil) then return "" end
if #Pages == 1 then
  return "\\relax"..Pages[1]["number"].."\\@nil"
else
  pageNo = "\\relax"..Pages[1]["number"]
  for i=2,#Pages do
    if Pages[i]["number"] then
      pageNo = pageNo..", "..Pages[i]["number"].."\\@nil"
      Pages[i] = {}
    end
  end
end
[.]
end

```

The following example runs `xindex -c dtk -l de -n <input>`

<code>\usepackage{makeidx}</code>	??			
	<b>Autorenliste</b>			
<code>\mbox{}\ref{president}</code>	<b>Elke Baehrendtsen</b>	[14]	<b>Martin Severs</b>	[4]
<code>\printindex</code>	dori@xyz.de		siehe Seite ??	
	<b>Horst Fannt</b>	[48]	<b>Herbert Voß</b>	[5]
	Friedrichallee 74		Wasgensteig 12	
	13233 Neu-Isenburg		10127 Potsdam	
	juergen.fannt@gmxnet.de		herbert@xyz.de	
	<b>Jonasson Jared Jazek</b>	[20]	<b>Herbert Voß</b>	[3]
	mail@jones.net		Wasgenstraße 121	
	<b>Martin Koomer</b>	[24, 31]	10127 Potsdam	
	Freiherr-von-Stein-Weg 16		herbert@xyz.de	
	15525 Erdingen-Neckar			
	kooma@xyz.info			
	<b>Eike Schuster</b>	[40]	<b>Michael Ziegenderaten</b>	[9]
	Haussteig 15		Lokostr. 19	
	36396 Stuttens		20713 Kalln	
	elke.schuster@kabelxyz.de		ziegenderaten@mail.com	

xindex-ll

## 7.1 Sublabels

There are three predefined sublabels for `\subitems`. The program itself can handle more, there is no limit for `xindex`.

xindex-12

```

\makeatletter
\g@addto@macro{\theindex}{%
  \def\subsubsubitem{\@idxitem\hspace*{35\p@}}
  \def\subsubsubsubitem{\@idxitem\hspace*{40\p@}}
}
\makeatother
\usepackage{makeidx}\makeindex

foo\index{foo} bar\index{foo!bar}
baz\index{foo!bar!baz} foobar%
\index{foo!bar!baz!foobar} Kuba
\index{foo!bar!baz!foobar!Kuba}
\newpage \printindex

```

## Index

**F**  
 foo, 1  
     - bar, 1  
       - baz, 1  
       — foobar, 1  
       — Kuba, 1

## 8 Including $\LaTeX$ commands into the .idx file

The command `\addtocontents` doesn't work for the index file. With the  $\LaTeX$  package `xindex` (same name as the Lua program `xindex`) defines a macro `\writeidx` which writes its argument into the .idx file. This can be useful to insert a pagebreak/"columnbreak before a new letter in the output of the index file:

```

\documentclass{article}
\usepackage{makeidx}
\makeindex
\usepackage{xindex}
\begin{document}

\index{foo}foo and
\writeidx{\clearpage}
\index{bar}bar

\printindex
\end{document}

```

Such commands are then taken into account by the program `xindex`. With the often used program `makeindex` such commands are ignored. In the following example we put an horizontal line after the first entry:

```
\usepackage{xindex}
\makeindex
```

```
\index{foo}foo and
\writeidx{\item\protect\hrulefill}
\index{bar}bar
\index{gex}gex
\printindex
```

## Index

### B

bar, 1

### F

foo, 1

### G

gex, 1

xindex-l3

## 9 Headings

By default the output uses the english headings: *Symbols*, *Numbers*, and *A ...* There are three predefined languages en, de, and fr. The definition is in the file `xindex-cfg-common.lua` (see also section 2 on page 4). It can easily be extended for other languages. Sometimes the headers are not needed, for example in a name list. With the optional argument `-n` or `--noheadings` the created `.ind` file has only the vertical space between different first letters:

```
\usepackage{makeidx}\makeindex
```

```
Ein foo\index{foo}\index{bar|()}
\newpage und \index{foo}
ein foo\index{foo|textit} \newpage
und foo\index{foo|textbf} \newpage
und foo\index{foo|fbox}
\index{bar|)}
\newpage
\verb|xindex -n <file>|
\printindex
```

`xindex -n <file>`

## Index

bar, 1–4

foo, 1f, 2, 3, 4

xindex-l4

The headings are printed by default as `\textbf`. This can be changed in the config file by setting the variable `idxnewletter`, for example: `idxnewletter = "\\textit"`. If you need some more code here then define an own macro for it, which can be seen in the following example. It has an own config file `xindex-header.lua` which has the line

```
idxnewletter = "\\idxnewletter"
```

In the documents preamble there is the definition:

```
\newcommand\idxnewletter[1]{\textbf{\textit{#1}}}
```

xindex-15

```

\usepackage{makeidx}\makeindex
\newcommand\idxnewletter[1]{\textbf{\textit{#1}}}

```

```

\section{Escaping characters}
\begin{itemize}
\item Exclamation mark ! \index{exclaim ("!)}
\item Vertical bar| \index{Vertical bar ("|)}
\item Doublequote \verb|"| \index{""}
\item Double doublequote \verb|" "| \index{" ""}
\item At character @ \index{At ("@)}
\end{itemize}
run \verb|xindex -c header <file.idx>|
\index{<file.idx>@\texttt{<file.idx>}}
\index{123}
\newpage
\printindex

```

## Index

### *Symbols*

“, 1  
 ”, 1  
 <file.idx>, 1

### *Numbers*

123, 1

### *A*

At (@), 1

### *E*

exclaim (!), 1

### *V*

Vertical bar (|), 1

## 10 Case sensitive index entries

By default foo and Foo are two different entries and will be handled differently by xindex: Foo will be as an own entry *before* foo. Let's see a more complex example. In the index the entry xindex-DIN2.lua is the first one of the xindex-??? series because uppercase letters are sorted before lowercase letters.

xindex-16

```

\usepackage{makeidx}
\usepackage{hyperref}

```

```

foo\newpage
\printindex

```

## Index

### **X**

xindex package, 2, 15  
 xindex program, 4, 13f  
 xindex-DIN2.lua file, 6  
 xindex-HAdW-eK0.lua file, 10  
 xindex-cfg-common.cfg file, 9  
 xindex-cfg-common.lua file, 14  
 xindex-cfg.lua file, 6, 10  
 xindex-dtk.lua file, 12  
 xindex-newfile.lua file, 6

The same example sorted with the -a or --nocasesensitive has another output: now xindex-cfg-common.lua is the first one of the xindex-??? series.



```
\usepackage{makeidx}
\usepackage{hyperref}
```

```
foo\newpage
\printindex
```

## Index

### X

xindex package, 2, 15  
 xindex program, 4, 13f  
 xindex-cfg-common.cfg file, 9  
 xindex-cfg-common.lua file, 14  
 xindex-cfg.lua file, 6, 10  
 xindex-DIN2.lua file, 6  
 xindex-dtk.lua file, 12  
 xindex-HAdW-eKO.lua file, 10  
 xindex-newfile.lua file, 6

xindex-17

## 11 Automatic index creation

With package xindex one can define several different index files, e.g. an index of names. With the optional argument imakeidx the package itself loads imakeidx and adds the program xindex as the default program to imakeidx.

xindex-18

```
\usepackage[imakeidx]{xindex}
\makeindex[name=persons,title=Index of names,
  columns=1,options=--noheadings]
\def\ThanhVN{Hàn Thê\protect\llap{%
  \raise 0.5ex\hbox{\'{}{}}}}
```

```
foo\index[persons]{Niepraschk,~ Rolf}
foo\index[persons]{Lamport,~ Leslie}
foo\index[persons]{Knuth,~ Donald}
foo\index[persons]{Knuth,~ Donald}
\newpage
foo\index[persons]{Lamport,~ Leslie}
foo\index[persons]{Thành,~ \ThanhVN}
foo\index[persons]{Kew,~ Jonathan}
foo\index[persons]{Kohm,~ Markus}
foo\index[persons]{Preining,~ Norbert}
\newpage
foo\index[persons]{Schenk,~ Christian}
foo\index[persons]{Feuerstack,~ Thomas}
foo\index[persons]{Tobin,~ Geoffrey}
foo\index[persons]{Wilson,~ Peter}
\newpage
foo\index[persons]{Kohm,~ Markus}
foo\index[persons]{Theiling,~ Henrik}
foo\index[persons]{Pégourié-Gonnard,~ Manuel}
foo\index[persons]{Roux,~ Élie}
\newpage
foo\index[persons]{Mittelbach,~ Frank}
foo\index[persons]{Fairbairns,~ Robin}
foo\index[persons]{Lemberg,~ Werner}
foo\index[persons]{Volovich,~ Vladimir}

\printindex[persons]
```

## Index of names

Fairbairns, Robin,  
Feuerstack, Thomas,

Kew, Jonathan,  
Knuth, Donald,  
Kohm, Markus,

Lamport, Leslie,  
Lemberg, Werner,

Mittelbach, Frank,

Niepraschk, Rolf,

Pégourié-Gonnard, Manuel,  
Preining, Norbert,

Roux, Élie,

Schenk, Christian,

Thành, Hàn Thê,  
Theiling, Henrik,  
Tobin, Geoffrey,

Volovich, Vladimir,

Wilson, Peter,

You have to run  $\LaTeX$  with the `--shell-escape` option to run `xindex` from within the  $\LaTeX$  document.

## 12 Demerits

- For more than 5000 entries in the `.idx` file the internal Lua function for sorting may take some time.
- The `.idx` file is not checked for  $\LaTeX$  errors in the argument of `\indexentry`.

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