

Package ‘oeis.tools’

October 7, 2026

Title Access and Visualize Integer Sequences from the OEIS

Version 0.3.1

Description Programmatic access, analysis, and visualization of integer sequences from the On-Line Encyclopedia of Integer Sequences (OEIS) <<https://oeis.org>>. Fetches sequence metadata and b-files, stores terms as arbitrary-precision integers via 'gmp', and plots them with 'ggplot2'.

License MIT + file LICENSE

Encoding UTF-8

Language en-US

Depends R (>= 4.1.0)

Imports htr2 (>= 0.2.0), jsonlite (>= 1.8.0), ggplot2 (>= 3.4.0), gmp (>= 0.7-0)

Suggests testthat (>= 3.2.0), knitr, rmarkdown, lintr, IRdisplay, withr

URL <https://github.com/oeistools/oeis-tools-R>

BugReports <https://github.com/oeistools/oeis-tools-R/issues>

VignetteBuilder knitr

Config/roxygen2/version 8.1.0

Config/testthat/edition 3

NeedsCompilation no

Author Enrique Pérez Herrero [aut, cre]

Maintainer Enrique Pérez Herrero <energycode.org@gmail.com>

Repository CRAN

Date/Publication 2026-10-07 07:50:02 UTC

Contents

BFile	2
check_id	3

create_bfile	3
extract_oeis_ids	4
get_bfile_data	4
get_bfile_indices	5
get_bfile_info	6
get_bibtex	6
get_data_values	7
get_filename	7
get_graph_image	8
get_graph_png	8
get_keyword_description	9
get_url	10
get_xref_ids	10
oeis_available	11
oeis_bfile	11
oeis_keyword_description	12
plot.Sequence	12
plot_data	13
Sequence	14
Index	15

BFile	<i>OEIS B-file Class</i>
-------	--------------------------

Description

OEIS B-file Class

Usage

BFile(oeis_id)

Arguments

oeis_id Character string (e.g., "A000045")
Downloads the b-file (list of n $a(n)$ pairs) of an OEIS sequence. If the download or parsing fails, a warning is issued and the object holds no data.

Value

An object of class "BFile"

Examples

```
primes <- BFile("A000040")
primes
```

check_id	<i>Check if an OEIS ID is valid</i>
----------	-------------------------------------

Description

Validates that the OEIS ID follows the format: A followed by exactly 6 digits

Usage

```
check_id(oeis_id)
```

Arguments

oeis_id	Character string to validate
---------	------------------------------

Value

Logical TRUE if valid, FALSE otherwise

Examples

```
check_id("A000045") # TRUE
check_id("invalid")  # FALSE
```

create_bfile	<i>Create a b-file text file for an OEIS sequence</i>
--------------	---

Description

Writes sequence values in the standard b-file format ("n a(n)", one pair per line).

Usage

```
create_bfile(oeis_id, data, offset = 1L, output_path)
```

Arguments

oeis_id	Character string (e.g., "A213676")
data	Vector of sequence values (numeric, integer, character, or gmp::bigz)
offset	Integer starting index. Defaults to 1
output_path	Directory or exact file path to save the b-file. When a directory is given, the standard b-file name (e.g., "b213676.txt") is used inside it

Value

Character string: the path to the created b-file

Examples

```
path <- create_bfile("A000045", c(0, 1, 1, 2, 3, 5, 8), offset = 0,
                      output_path = tempdir())
readLines(path)
unlink(path)
```

extract_oeis_ids	<i>Extract OEIS IDs from text</i>
------------------	-----------------------------------

Description

Extract OEIS IDs from text

Usage

```
extract_oeis_ids(text)
```

Arguments

text	Character string to search
------	----------------------------

Value

Character vector of OEIS IDs

Examples

```
extract_oeis_ids("Cf. A000045, A000032 and A000045.")
```

get_bfile_data	<i>Get B-file Data</i>
----------------	------------------------

Description

Get B-file Data

Usage

```
get_bfile_data(bfile)
```

Arguments

bfile A BFile object

Value

A `gmp::bigz` vector or `NULL`

Examples

```
primes <- BFile("A000040")
head(get_bfile_data(primes))
```

get_bfile_indices	<i>Get B-file Indices</i>
-------------------	---------------------------

Description

Get B-file Indices

Usage

```
get_bfile_indices(bfile)
```

Arguments

bfile A BFile object

Value

Integer vector of the first-column indices, or `NULL` when parsing failed

Examples

```
primes <- BFile("A000040")
head(get_bfile_indices(primes))
```

get_bfile_info	<i>Get B-file Information</i>
----------------	-------------------------------

Description

Get B-file Information

Usage

```
get_bfile_info(seq)
```

Arguments

seq	A Sequence object
-----	-------------------

Value

List with b-file metadata: available, filename, url, length, first, last, min, max

Examples

```
fib <- Sequence("A000045")
get_bfile_info(fib)
```

get_bibtex	<i>Build a BibTeX @misc entry citing this OEIS sequence</i>
------------	---

Description

Build a BibTeX @misc entry citing this OEIS sequence

Usage

```
get_bibtex(seq)
```

Arguments

seq	A Sequence object
-----	-------------------

Value

Character string with a BibTeX @misc entry

Examples

```
fib <- Sequence("A000045")
cat(get_bibtex(fib))
```

get_data_values	<i>Return the parsed sequence data terms</i>
-----------------	--

Description

Return the parsed sequence data terms

Usage

```
get_data_values(seq)
```

Arguments

seq	A Sequence object
-----	-------------------

Value

A `gmp::bigz` vector of terms

Examples

```
fib <- Sequence("A000045")
get_data_values(fib)[1:10]
```

get_filename	<i>Get B-file Filename</i>
--------------	----------------------------

Description

Get B-file Filename

Usage

```
get_filename(bfile)
```

Arguments

bfile	A BFile object
-------	----------------

Value

Character string

Examples

```
primes <- BFile("A000040")
get_filename(primes)
```

get_graph_image	<i>Retrieve the OEIS graph image for display</i>
-----------------	--

Description

Uses `IRdisplay::display_png()` when running inside a Jupyter/IRkernel session; otherwise returns the raw PNG bytes.

Usage

```
get_graph_image(
  seq,
  width = NULL,
  height = NULL,
  timeout = 10,
  use_cache = TRUE
)
```

Arguments

seq	A Sequence object
width	Optional display width in pixels
height	Optional display height in pixels
timeout	Numeric timeout in seconds
use_cache	Logical; reuse a previously downloaded PNG when TRUE

Value

Raw vector of PNG bytes (invisibly, when displayed via `IRdisplay`)

Examples

```
fib <- Sequence("A000045")
img <- get_graph_image(fib)
```

get_graph_png	<i>Download the OEIS graph image as PNG bytes</i>
---------------	---

Description

Download the OEIS graph image as PNG bytes

Usage

```
get_graph_png(seq, timeout = 10, use_cache = TRUE)
```

Arguments

seq	A Sequence object
timeout	Numeric timeout in seconds
use_cache	Logical; reuse a previously downloaded PNG when TRUE (default)

Value

Raw vector of PNG bytes

Examples

```
fib <- Sequence("A000045")
png_bytes <- get_graph_png(fib)
length(png_bytes)
```

get_keyword_description

Return the OEIS keyword description for a given tag

Description

Instance-method wrapper around [oeis_keyword_description\(\)](#).

Usage

```
get_keyword_description(seq, keyword_tag)
```

Arguments

seq	A Sequence object
keyword_tag	Character string

Value

Character string with description, or NULL

Examples

```
fib <- Sequence("A000045")
get_keyword_description(fib, fib$keyword[1])
```

get_url	<i>Get B-file URL</i>
---------	-----------------------

Description

Get B-file URL

Usage

```
get_url(bfile)
```

Arguments

bfile A BFile object

Value

Character string

Examples

```
primes <- BFile("A000040")
get_url(primes)
```

get_xref_ids	<i>Extract cross-reference IDs</i>
--------------	------------------------------------

Description

Extract cross-reference IDs

Usage

```
get_xref_ids(seq)
```

Arguments

seq A Sequence object

Value

Character vector of unique OEIS IDs, in first-seen order

Examples

```
fib <- Sequence("A000045")
head(get_xref_ids(fib))
```

oeis_available	<i>Check whether the OEIS web service is reachable</i>
----------------	--

Description

Sends a small request to the OEIS search API. Useful to guard code that needs the network, since the OEIS may be down or may refuse requests from some hosts (for example, cloud or continuous-integration servers).

Usage

```
oeis_available(timeout = 5)
```

Arguments

timeout	Numeric timeout in seconds
---------	----------------------------

Value

TRUE if the OEIS answered successfully, FALSE otherwise

Examples

```
oeis_available()
```

oeis_bfile	<i>Generate OEIS b-file filename</i>
------------	--------------------------------------

Description

Generate OEIS b-file filename

Usage

```
oeis_bfile(oeis_id)
```

Arguments

oeis_id	Character string (e.g., "A000045")
---------	------------------------------------

Value

Character string (e.g., "b000045.txt")

Examples

```
oeis_bfile("A000045")
```

```
oeis_keyword_description
    Get OEIS keyword description
```

Description

Get OEIS keyword description

Usage

```
oeis_keyword_description(keyword_tag)
```

Arguments

keyword_tag Character string

Value

Character string with description or NULL

Examples

```
oeis_keyword_description("core")
oeis_keyword_description("nonn")
```

```
plot.Sequence      Plot Sequence Data
```

Description

Prefers the sequence's embedded b-file (richer, longer) and falls back to the terms parsed from the OEIS JSON entry.

Usage

```
## S3 method for class 'Sequence'
plot(x, ...)
```

Arguments

x A Sequence object
 ... Additional arguments passed to [plot_data\(\)](#)

Value

The value returned by `plot_data()`: a ggplot object when `return_plot = TRUE`, otherwise invisible NULL

Examples

```
fib <- Sequence("A000045")
plot(fib, n = 50)
```

plot_data	<i>Plot B-file Data</i>
-----------	-------------------------

Description

Plot B-file Data

Usage

```
plot_data(bfile, n = NULL, plot_style = "line", ...)

## S3 method for class 'BFile'
plot_data(
  bfile,
  n = NULL,
  plot_style = "line",
  p = NULL,
  show = TRUE,
  return_plot = FALSE,
  ...
)
```

Arguments

bfile	A BFile object
n	Number of leading points to plot. When NULL (default), all available points are plotted
plot_style	One of "line" (default), "joined" (alias for "line"), or "scatter"
...	Additional aesthetic parameters forwarded to <code>geom_line()</code> or <code>geom_point()</code>
p	An existing ggplot object to layer onto, or NULL to create a new plot
show	Logical; print the plot when TRUE (default)
return_plot	Logical; return the ggplot object when TRUE. Defaults to FALSE

Value

A ggplot2 plot object when `return_plot = TRUE`; otherwise invisible NULL

Examples

```
primes <- BFile("A000040")
plot_data(primes, n = 100, plot_style = "scatter")
g <- plot_data(primes, n = 100, show = FALSE, return_plot = TRUE)
```

Sequence

OEIS Sequence Class

Description

OEIS Sequence Class

Usage

```
Sequence(oeis_id)
```

Arguments

oeis_id Character string (e.g., "A000045")

Value

An object of class "Sequence"

Fetches an OEIS entry (and its b-file) over the internet.

Examples

```
fib <- Sequence("A000045")
fib$name
```

Index

BFile, [2](#)

check_id, [3](#)

create_bfile, [3](#)

extract_oeis_ids, [4](#)

get_bfile_data, [4](#)

get_bfile_indices, [5](#)

get_bfile_info, [6](#)

get_bibtex, [6](#)

get_data_values, [7](#)

get_filename, [7](#)

get_graph_image, [8](#)

get_graph_png, [8](#)

get_keyword_description, [9](#)

get_url, [10](#)

get_xref_ids, [10](#)

oeis_available, [11](#)

oeis_bfile, [11](#)

oeis_keyword_description, [12](#)

oeis_keyword_description(), [9](#)

plot.Sequence, [12](#)

plot_data, [13](#)

plot_data(), [12](#), [13](#)

Sequence, [14](#)