

Package ‘gtfsio’

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Type Package

Title Read and Write General Transit Feed Specification (GTFS) Files

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Description Tools for the development of packages related to General Transit Feed Specification (GTFS) files. Establishes a standard for representing GTFS feeds using R data types. Provides fast and flexible functions to read and write GTFS feeds while sticking to this standard. Defines a basic 'gtfs' class which is meant to be extended by packages that depend on it. And offers utility functions that support checking the structure of GTFS objects.

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URL <https://r-transit.github.io/gtfsio/>,
<https://github.com/r-transit/gtfsio>

BugReports <https://github.com/r-transit/gtfsio/issues>

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'export_gtfs.R' 'get_gtfs_standards.R' 'gtfs_methods.R'
'gtfs_subset.R' 'gtfsio.R' 'import_gtfs.R' 'new_gtfs.R'

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assert_gtfs	<i>GTFS object validator</i>
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Description

Asserts that a GTFS object is valid. Valid objects are those in which:

- Every element is named.
- Every element inherits from `data.frames`.

The exception to the second rule are objects that contain an element named `"."`. In such case, this element is actually composed by a named list of elements who inherit from `data.frames`.

Usage

```
assert_gtfs(x)
```

Arguments

`x` A GTFS object.

Value

The same GTFS object passed to `x`.

See Also

Other constructors: [new_gtfs\(\)](#)

Examples

```
gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")

gtfs <- import_gtfs(gtfs_path)
gtfs <- assert_gtfs(gtfs)
```

check_field_class	<i>Check the classes of fields in a GTFS object element</i>
-------------------	---

Description

Checks the classes of fields, represented by columns, inside a GTFS object element.

Usage

```
check_field_class(x, file, fields, classes)

assert_field_class(x, file, fields, classes)
```

Arguments

x	A GTFS object.
file	A string. The element, that represents a GTFS text file, whose fields' classes should be checked.
fields	A character vector. The fields to have their classes checked.
classes	A character vector, with the same length of fields. The classes that each field must inherit from.

Value

check_field_class returns TRUE if the check is successful, and FALSE otherwise.
assert_field_class returns x invisibly if the check is successful, and throws an error otherwise.

See Also

Other checking functions: [check_field_exists\(\)](#), [check_file_exists\(\)](#)

Examples

```
gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")
gtfs <- import_gtfs(gtfs_path)

check_field_class(
  gtfs,
  "calendar",
  fields = c("monday", "tuesday"),
```

```

  classes = rep("integer", 2)
)

check_field_class(
  gtfs,
  "calendar",
  fields = c("monday", "tuesday"),
  classes = c("integer", "character")
)

```

check_field_exists *Check the existence of fields in a GTFS object element*

Description

Checks the existence of fields, represented by columns, inside a GTFS object element.

Usage

```

check_field_exists(x, file, fields)

assert_field_exists(x, file, fields)

```

Arguments

x	A GTFS object.
file	A string. The element, that represents a GTFS text file, where fields should be searched.
fields	A character vector. The fields to check the existence of.

Value

check_field_exists returns TRUE if the check is successful, and FALSE otherwise.
 assert_field_exists returns x invisibly if the check is successful, and throws an error otherwise.

See Also

Other checking functions: [check_field_class\(\)](#), [check_file_exists\(\)](#)

Examples

```

gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")
gtfs <- import_gtfs(gtfs_path)

check_field_exists(gtfs, "calendar", c("monday", "tuesday"))

check_field_exists(gtfs, "calendar", c("monday", "oi"))

```

check_file_exists	<i>Check the existence of text files in a GTFS object</i>
-------------------	---

Description

Checks the existence of elements inside a GTFS object that represent specific GTFS text files.

Usage

```
check_file_exists(x, files)
```

```
assert_file_exists(x, files)
```

Arguments

x	A GTFS object.
files	A character vector. The files to check the existence of.

Value

check_file_exists returns TRUE if the check is successful, and FALSE otherwise.
assert_file_exists returns x invisibly if the check is successful, and throws an error otherwise.

See Also

Other checking functions: [check_field_class\(\)](#), [check_field_exists\(\)](#)

Examples

```
gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")
gtfs <- import_gtfs(gtfs_path)

check_file_exists(gtfs, c("calendar", "agency"))

check_file_exists(gtfs, c("calendar", "oi"))
```

export_gtfs	<i>Export GTFS objects</i>
-------------	----------------------------

Description

Writes GTFS objects to disk as GTFS transit feeds. The object must be formatted according to the standards for reading and writing GTFS transit feeds, as specified in [get_gtfs_standards](#) (i.e. data types are not checked). If present, does not write auxiliary tables held in a sub-list named ". ".

Usage

```
export_gtfs(
  gtfs,
  path,
  files = NULL,
  standard_only = FALSE,
  compression_level = 9,
  as_dir = FALSE,
  overwrite = TRUE,
  quiet = TRUE
)
```

Arguments

gtfs	A GTFS object.
path	A string. Where the resulting .zip file must be written to.
files	A character vector. The name of the elements to be written to the feed.
standard_only	A logical. Whether only standard files and fields should be written (defaults to TRUE, which drops extra files and fields).
compression_level	A numeric, between 1 and 9. The higher the value, the best the compression, which demands more processing time. Defaults to 9 (best compression).
as_dir	A logical. Whether the feed should be exported as a directory, instead of a .zip file. Defaults to FALSE.
overwrite	A logical. Whether to overwrite an existing .zip file (defaults to TRUE).
quiet	A logical. Whether to hide log messages and progress bars (defaults to TRUE).

Value

Invisibly returns the same GTFS object passed to gtfs.

See Also

[get_gtfs_standards](#)

Other io functions: [import_gtfs\(\)](#)

Examples

```
gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")

gtfs <- import_gtfs(gtfs_path)

tmpf <- tempfile(pattern = "gtfs", fileext = ".zip")

export_gtfs(gtfs, tmpf)
zip::zip_list(tmpf)$filename
```

```
export_gtfs(gtfs, tmpf, files = c("shapes", "trips"))
zip::zip_list(tmpf)$filename
```

get_gtfs_standards *Generate GTFS standards*

Description

Generates a list specifying the standards to be used when reading and writing GTFS feeds with R. Each element (also a list) represents a distinct GTFS text file, and describes:

- whether this file is required, optional or conditionally required;
- the fields that compose each file, including which R data type is best suited to represent it, whether the field is required, optional or conditionally required, and which values it can assume (most relevant to GTFS ENUMs).

Usage

```
get_gtfs_standards()
```

Value

A named list, in which each element represents the R equivalent of each GTFS text file standard.

Details

GTFS standards were derived from [Google's Static GTFS Reference](#). The R data types chosen to represent each GTFS data type are described below:

- Color = character
- Currency code = character
- Date = integer
- Email = character
- ENUM = integer
- ID = character
- Integer = integer
- Language code = character
- Latitude = numeric
- Longitude = numeric
- Float = numeric
- Phone number = character
- Text = character
- Time = character
- Timezone = character
- URL = character

Examples

```
gtfs_standards <- get_gtfs_standards()
```

gtfsio	<i>gtfsio: Read and Write General Transit Feed Specification (GTFS) Data</i>
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Description

Tools for the development of GTFS-related packages. Establishes a standard for representing GTFS feeds using R data types. Provides fast and flexible functions to read and write GTFS feeds while sticking to this standard. Defines a basic `gtfs` class which is meant to be extended by packages that depend on it. And offers utility functions that support checking the structure of GTFS objects.

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See Also

Useful links:

- <https://r-transit.github.io/gtfsio/>
- <https://github.com/r-transit/gtfsio>
- Report bugs at <https://github.com/r-transit/gtfsio/issues>

import_gtfs

*Import GTFS transit feeds***Description**

Imports GTFS transit feeds from either a local .zip file or an URL. Columns are parsed according to the standards for reading and writing GTFS feeds specified in [get_gtfs_standards](#).

Usage

```
import_gtfs(
  path,
  files = NULL,
  fields = NULL,
  extra_spec = NULL,
  skip = NULL,
  quiet = TRUE,
  encoding = "unknown"
)
```

Arguments

path	A string. The path to a GTFS .zip file.
files	A character vector. The text files to be read from the GTFS, without the .txt extension. If NULL (the default), all existing text files are read.
fields	A named list. The fields to be read from each text file, in the format <code>list(file1 = c("field1", "field2"))</code> . If NULL (the default), all fields from the files specified in <code>files</code> are read. If a file is specified in <code>files</code> but not in <code>fields</code> , all fields from that file will be read (i.e. you may specify in <code>fields</code> only files whose fields you want to subset).
extra_spec	A named list. Custom specification used when reading undocumented fields, in the format <code>list(file1 = c(field1 = "type1", field2 = "type2"))</code> . If NULL (the default), all undocumented fields are read as character. Similarly, if an undocumented field is not specified in <code>extra_spec</code> , it is read as character (i.e. you may specify in <code>extra_spec</code> only the fields that you want to read as a different type). Only supports the character, integer and numeric types, also used in get_gtfs_standards .
skip	A character vector. Text files that should not be read from the GTFS, without the .txt extension. If NULL (the default), no files are skipped. Cannot be used if <code>files</code> is set.
quiet	A logical. Whether to hide log messages and progress bars (defaults to TRUE).
encoding	A string. Passed to <code>fread</code> , defaults to "unknown". Other possible options are "UTF-8" and "Latin-1". Please note that this is not used to re-encode the input, but to enable handling encoded strings in their native encoding.

Value

A GTFS object: a named list of data frames, each one corresponding to a distinct text file from the given GTFS feed.

See Also

[get_gtfs_standards](#)

Other io functions: [export_gtfs\(\)](#)

Examples

```
gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")

# read all files and columns
gtfs <- import_gtfs(gtfs_path)
names(gtfs)
names(gtfs$trips)

# read all columns from selected files
gtfs <- import_gtfs(gtfs_path, files = c("trips", "stops"))
names(gtfs)
names(gtfs$trips)

# read specific columns from selected files
gtfs <- import_gtfs(
  gtfs_path,
  files = c("trips", "stops"),
  fields = list(
    trips = c("route_id", "trip_id"),
    stops = c("stop_id", "stop_lat", "stop_lon")
  )
)
```

new_gtfs

GTFS object constructor

Description

Creates a GTFS object. Mostly useful for package authors who may want to either create `gtfs` objects in their packages or create subclasses of the main `gtfs` class. The usage of this function assumes some knowledge on `gtfs` objects, thus inputs are not extensively checked. See [assert_gtfs](#) for more thorough checks.

Usage

```
new_gtfs(x, subclass = character(), ...)
```

Arguments

x	A GTFS-like object (either a GTFS object or a named list). Each element must represent a distinct GTFS text file.
subclass	A character vector. Subclasses to be assigned to the gtfs object.
...	Name-value pairs. Additional attributes.

Value

A GTFS object: a named list of data frames, each one corresponding to a distinct GTFS text file, with `gtfs` and `list` classes.

See Also

Other constructors: [assert_gtfs\(\)](#)

Examples

```
gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")

tmpdir <- tempfile(pattern = "new_gtfs_example")
zip::unzip(gtfs_path, exdir = tmpdir)

agency <- data.table::fread(file.path(tmpdir, "agency.txt"))
stops <- data.table::fread(file.path(tmpdir, "stops.txt"))
routes <- data.table::fread(file.path(tmpdir, "routes.txt"))
trips <- data.table::fread(file.path(tmpdir, "trips.txt"))
stop_times <- data.table::fread(file.path(tmpdir, "stop_times.txt"))
calendar <- data.table::fread(file.path(tmpdir, "calendar.txt"))

txt_files <- list(
  agency = agency,
  stops = stops,
  routes = routes,
  trips = trips,
  stop_times = stop_times,
  calendar = calendar
)

gtfs <- new_gtfs(txt_files)

class(gtfs)
names(gtfs)
```

print.gtfs *Print a GTFS object*

Description

Prints a GTFS object suppressing the class attribute.

Usage

```
## S3 method for class 'gtfs'  
print(x, ...)
```

Arguments

x A GTFS object.
... Optional arguments ultimately passed to format.

Value

The GTFS object that was printed, invisibly.

Examples

```
gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")  
gtfs <- import_gtfs(gtfs_path)  
  
# subset 'gtfs' for a smaller output  
gtfs <- gtfs[c("routes", "trips")]  
  
print(gtfs)
```

summary.gtfs *Print summary of a GTFS object*

Description

Print summary of a GTFS object

Usage

```
## S3 method for class 'gtfs'  
summary(object, ...)
```

Arguments

object	A GTFS object.
...	Ignored.

Examples

```
gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")
gtfs <- import_gtfs(gtfs_path)

summary(gtfs)
```

[.gtfs *Subset a GTFS object*

Description

Subsetting a GTFS object using [preserves the object class.

Usage

```
## S3 method for class 'gtfs'
x[value]
```

Arguments

x	A GTFS object.
value	Either a numeric or a character vector. Designates the elements to be returned.

Value

A GTFS object.

Examples

```
gtfs_path <- system.file("extdata/ggl_gtfs.zip", package = "gtfsio")

gtfs <- import_gtfs(gtfs_path)
names(gtfs)
class(gtfs)

small_gtfs <- gtfs[1:5]
names(small_gtfs)
class(small_gtfs)

small_gtfs <- gtfs[c("shapes", "trips")]
names(small_gtfs)
class(small_gtfs)
```

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