

Package ‘BiocFHIR’

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Title Illustration of FHIR ingestion and transformation using R

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Description FHIR R4 bundles in JSON format are derived from <https://synthea.mitre.org/downloads>. Transformation inspired by a kaggle notebook published by Dr Alexander Scarlet, <https://www.kaggle.com/code/drscarlat/fhir-starter-parse-healthcare-bundles-into-tables>. This is a very limited illustration of some basic parsing and reorganization processes. Additional tooling will be required to move beyond the Synthea data illustrations.

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Encoding UTF-8

Depends R (>= 4.2)

Imports DT, shiny, jsonlite, graph, tidyr, visNetwork, igraph, utils, methods, BiocBaseUtils

Suggests knitr, testthat, rjsoncons

VignetteBuilder knitr

biocViews Infrastructure, DataImport, DataRepresentation

RoxygenNote 7.2.1

URL <https://github.com/vjcitn/BiocFHIR>

BugReports <https://github.com/vjcitn/BiocFHIR/issues>

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R topics documented:

add_procedures	2
allin	3
available_retention_schemas	3
build_procond_igraph	4
display_procond_igraph	4
FHIRtabs	5
FHIR_ResourceTypes	5
FHIR_retention_schemas	6
getHumanName	6
make_condition_graph	7
make_test_json_set	7
print.BiocFHIR.FHIRgraph	8
print.FHIR.bundle	8
process_AllergyIntolerance	9
process_CarePlan	10
process_Claim	10
process_Condition	11
process_Encounter	12
process_fhir_bundle	12
process_Immunization	13
process_MedicationRequest	14
process_Observation	14
process_Patient	15
process_Procedure	16

Index	17
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add_procedures	<i>update a fhir graph on patients and conditions with procedures</i>
----------------	---

Description

update a fhir graph on patients and conditions with procedures

Usage

```
add_procedures(fhirgraph, listOfProcessedBundles)
```

Arguments

fhirgraph	instance of BiocFHIR.FHIRgraph
listOfProcessedBundles	list

Value

instance of BiocFHIR.FHIRgraph

Examples

```
data("allin")
g <- make_condition_graph(allin)
g <- add_procedures(g, allin)
g
```

allin	<i>collection of synthea FHIR documents ingested</i>
-------	--

Description

collection of synthea FHIR documents ingested

Usage

```
data("allin", package = "BiocFHIR")
```

Format

list

Examples

```
data("allin", package="BiocFHIR")
allin[[1]]
```

available_retention_schemas	<i>list available 'retention schemas'</i>
-----------------------------	---

Description

list available 'retention schemas'

Usage

```
available_retention_schemas()
```

Value

character vector

Examples

```
available_retention_schemas()
```

build_prococond_igraph *build graph with patients, conditions and procedures*

Description

build graph with patients, conditions and procedures

Usage

```
build_prococond_igraph(listOfBundles)
```

Arguments

listOfBundles list of processed FHIR bundles, processed with ‘process_fhir_bundle‘

Value

instance of visIgraph from visNetworks

Examples

```
data("allin")
build_prococond_igraph( allin )
```

display_prococond_igraph
make network visualization

Description

make network visualization

Usage

```
display_prococond_igraph(igraph)
```

Arguments

igraph instance of igraph produced by ‘build_prococond_igraph‘

Value

visIgraph instance

Examples

```
data("allin")
g <- build_procond_igraph( allin )
if (interactive()) {
  display_procond_igraph( g )
}
```

FHIRtabs	<i>table app</i>
----------	------------------

Description

table app

Usage

```
FHIRtabs()
```

Value

No value returned.

Examples

```
if (interactive()) {
  FHIRtabs()
}
```

FHIR_ResourceTypes	<i>FHIR Resource types recognized in package</i>
--------------------	--

Description

FHIR Resource types recognized in package

Usage

```
FHIR_ResourceTypes()
```

Value

vector of strings

Examples

```
FHIR_ResourceTypes() # Oct 2022
```

FHIR_retention_schemas

collection of FHIR Resource components to be retained

Description

collection of FHIR Resource components to be retained

Usage

```
FHIR_retention_schemas()
```

Value

list of vectors of strings

Examples

```
FHIR_retention_schemas() # Oct 2022
```

getHumanName

get human name from a BiocFHIR.Patient instance

Description

get human name from a BiocFHIR.Patient instance

Usage

```
getHumanName(Patient)
```

Arguments

Patient BiocFHIR.Patient instance

Value

string with name components concatenated

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",  
  package="BiocFHIR")  
tbun <- process_fhir_bundle(testf)  
getHumanName(tbun$Patient)
```

make_condition_graph *create graph with links from patients to conditions*

Description

create graph with links from patients to conditions

Usage

```
make_condition_graph(listOfProcessedBundles, keep_with_condition_only = TRUE)
```

Arguments

listOfProcessedBundles
list with elements generated by 'process_fhir_bundle'
keep_with_condition_only
logical(1) omit bundles that lack a "Condition" element, defaults to TRUE

Value

instance of BiocFHIR.FHIRgraph

Examples

```
data("allin")  
make_condition_graph(allin, TRUE)
```

make_test_json_set *produce 50 json FHIR files in a folder*

Description

produce 50 json FHIR files in a folder

Usage

```
make_test_json_set(target = paste0(tempdir(), "/jstest"), reuse = TRUE)
```

Arguments

target
character(1) a path, defaults to 'jstest' under 'tempdir()'; the contents of syn-
thfhir.zip, in inst/zip of BiocFHIR, will be deposited there.
reuse
logical(1) if TRUE, just use what is there, if folder already exists

Value

a vector of paths to FHIR JSON, invisibly

Examples

```
z <- make_test_json_set()
z[1:3]
```

```
print.BiocFHIR.FHIRgraph
```

show a combination of graph and patient attributes

Description

show a combination of graph and patient attributes

Usage

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

Arguments

x	instance of BiocFHIR.FHIRgraph
...	not used

Value

print method

Examples

```
data("allin")
make_condition_graph(allin)
```

```
print.FHIR.bundle
```

print method

Description

print method

Usage

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


Arguments

x	BiocFHIR FHIR.bundle instance
...	not used

Value

print method

process_AllergyIntolerance

extract information from retained fields in AllergyIntolerance component of FHIR Bundle, produce simple data.frame

Description

extract information from retained fields in AllergyIntolerance component of FHIR Bundle, produce simple data.frame

Usage

```
process_AllergyIntolerance(AllergyIntolerance)
```

Arguments

AllergyIntolerance	component of FHIR.bundle instance
--------------------	-----------------------------------

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",  
  package="BiocFHIR")  
tbun <- process_fhir_bundle(testf)  
process_AllergyIntolerance(tbun$AllergyIntolerance)
```

process_CarePlan	<i>extract information from retained fields in CarePlan component of FHIR Bundle, produce simple data.frame</i>
------------------	---

Description

extract information from retained fields in CarePlan component of FHIR Bundle, produce simple data.frame

Usage

```
process_CarePlan(CarePlan)
```

Arguments

CarePlan	component of FHIR.bundle instance
----------	-----------------------------------

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",  
  package="BiocFHIR")  
tbun <- process_fhir_bundle(testf)  
process_CarePlan(tbun$CarePlan)
```

process_Claim	<i>extract information from retained fields in Claim component of FHIR Bundle, produce simple data.frame</i>
---------------	--

Description

extract information from retained fields in Claim component of FHIR Bundle, produce simple data.frame

Usage

```
process_Claim(Claim)
```

Arguments

Claim	component of FHIR.bundle instance
-------	-----------------------------------

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",
  package="BiocFHIR")
tbun <- process_fhir_bundle(testf)
process_Claim(tbun$Claim)
```

process_Condition	<i>extract information from retained fields in Condition component of FHIR Bundle, produce simple data.frame</i>
-------------------	--

Description

extract information from retained fields in Condition component of FHIR Bundle, produce simple data.frame

Usage

```
process_Condition(Condition)
```

Arguments

Condition component of FHIR.bundle instance

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",
  package="BiocFHIR")
tbun <- process_fhir_bundle(testf)
process_Condition(tbun$Condition)
```

process_Encounter *extract information from retained fields in Encounter component of FHIR Bundle, produce simple data.frame*

Description

extract information from retained fields in Encounter component of FHIR Bundle, produce simple data.frame

Usage

```
process_Encounter(Encounter)
```

Arguments

Encounter component of FHIR.bundle instance

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",
  package="BiocFHIR")
tbun <- process_fhir_bundle(testf)
process_Encounter(tbun$Encounter)
```

process_fhir_bundle *process a bundle of FHIR R4 JSON*

Description

process a bundle of FHIR R4 JSON

Usage

```
process_fhir_bundle(json_file, schemas = FHIR_retention_schemas())
```

Arguments

json_file character(1) path to text in JSON format
 schemas list of character vectors defining expected fields, defaults to FHIR_retention_schemas()

Value

instance of FHIR.bundle, extending list

Note

If one encounters the error "Element ... lacks field", the schemas argument can be modified by removing the noted field from the schema.

Examples

```
testf = system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",
  package="BiocFHIR")
tbun = process_fhir_bundle(testf)
tbun
```

process_Immunization *extract information from retained fields in Immunization component of FHIR Bundle, produce simple data.frame*

Description

extract information from retained fields in Immunization component of FHIR Bundle, produce simple data.frame

Usage

```
process_Immunization(Immunization)
```

Arguments

Immunization component of FHIR.bundle instance

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",
  package="BiocFHIR")
tbun <- process_fhir_bundle(testf)
process_Immunization(tbun$Immunization)
```

process_MedicationRequest *extract information from retained fields in MedicationRequest component of FHIR Bundle, produce simple data.frame*

Description

extract information from retained fields in MedicationRequest component of FHIR Bundle, produce simple data.frame

Usage

```
process_MedicationRequest(MedicationRequest)
```

Arguments

MedicationRequest
component of FHIR.bundle instance

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",  
  package="BiocFHIR")  
tbun <- process_fhir_bundle(testf)  
process_MedicationRequest(tbun$MedicationRequest)
```

process_Observation *extract information from retained fields in Observation component of FHIR Bundle, produce simple data.frame*

Description

extract information from retained fields in Observation component of FHIR Bundle, produce simple data.frame

Usage

```
process_Observation(Observation)
```

Arguments

Observation component of FHIR.bundle instance

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",
  package="BiocFHIR")
tbun <- process_fhir_bundle(testf)
process_Observation(tbun$Observation)
```

process_Patient	<i>flatten information in Patient component of a bundle to a one-line data.frame</i>
-----------------	--

Description

flatten information in Patient component of a bundle to a one-line data.frame

Usage

```
process_Patient(Patient)
```

Arguments

Patient element of FHIR.bundle instance

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",
  package="BiocFHIR")
tbun <- process_fhir_bundle(testf)
tpat <- process_Patient(tbun$Patient)
head(names(tpat))
tags <- c("identifier.system3", "identifier.value3")
tpat[tags,,FALSE]
tags2 <- grep("extension.extension", rownames(tpat), value=TRUE)
tpat[tags2,,FALSE]
```

process_Procedure	<i>extract information from retained fields in Procedure component of FHIR Bundle, produce simple data.frame</i>
-------------------	--

Description

extract information from retained fields in Procedure component of FHIR Bundle, produce simple data.frame

Usage

```
process_Procedure(Procedure)
```

Arguments

Procedure component of FHIR.bundle instance

Value

data.frame

Examples

```
testf <- system.file("json/Vince741_Rogahn59_6fa3d4ab-c0b6-424a-89d8-7d9105129296.json",  
  package="BiocFHIR")  
tbun <- process_fhir_bundle(testf)  
process_Procedure(tbun$Procedure)
```


Index

* datasets

- allin, [3](#)

- add_procedures, [2](#)
- allin, [3](#)
- available_retention_schemas, [3](#)

- build_prococond_igraph, [4](#)

- display_prococond_igraph, [4](#)

- FHIR_ResourceTypes, [5](#)
- FHIR_retention_schemas, [6](#)
- FHIRtabs, [5](#)

- getHumanName, [6](#)

- make_condition_graph, [7](#)
- make_test_json_set, [7](#)

- print.BiocFHIR.FHIRgraph, [8](#)
- print.FHIR.bundle, [8](#)
- process_AllergyIntolerance, [9](#)
- process_CarePlan, [10](#)
- process_Claim, [10](#)
- process_Condition, [11](#)
- process_Encounter, [12](#)
- process_fhir_bundle, [12](#)
- process_Immunization, [13](#)
- process_MedicationRequest, [14](#)
- process_Observation, [14](#)
- process_Patient, [15](#)
- process_Procedure, [16](#)