

Package ‘FeatureExtraction’

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Type Package

Title Generating Features for a Cohort

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Description An R package for generating features (covariates) for a cohort using data in the Common Data Model.

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VignetteBuilder knitr

URL <https://github.com/OHDSI/FeatureExtraction>

BugReports <https://github.com/OHDSI/FeatureExtraction/issues>

Depends R (>= 3.2.2),
DatabaseConnector (>= 3.0.0),
Andromeda

Imports methods,
dplyr,
rJava,
jsonlite,
SqlRender (>= 1.6.0),
ParallelLogger,
cli,
pillar,
readr,
rlang

Suggests testthat,
knitr,
rmarkdown

NeedsCompilation no

RoxygenNote 7.1.0

Encoding UTF-8

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aggregateCovariates	<i>Aggregate covariate data</i>
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Description

Aggregate covariate data

Usage

```
aggregateCovariates(covariateData)
```

Arguments

`covariateData` An object of type `covariateData` as generated using `getDbCovariateData`.

Value

An object of class `covariateData`.

`computeStandardizedDifference`*Compute standardized difference of mean for all covariates.*

Description

Computes the standardized difference for all covariates between two cohorts. The standardized difference is defined as the difference between the mean divided by the overall standard deviation.

Usage

```
computeStandardizedDifference(covariateData1, covariateData2)
```

Arguments

`covariateData1` The covariate data of the first cohort. Needs to be in aggregated format.

`covariateData2` The covariate data of the second cohort. Needs to be in aggregated format.

Value

A data frame with means and standard deviations per cohort as well as the standardized difference of mean.

`convertPrespecSettingsToDetailedSettings`*Convert prespecified covariate settings into detailed covariate settings*

Description

Convert prespecified covariate settings into detailed covariate settings

Usage

```
convertPrespecSettingsToDetailedSettings(covariateSettings)
```

Arguments

`covariateSettings`

An object of type `covariateSettings` as created for example by the [createCovariateSettings](#) function.

Details

For advanced users only.

Value

An object of type `covariateSettings`, to be used in other functions.

CovariateData-class *Covariate Data*

Description

CovariateData is an S4 class that inherits from [Andromeda](#). It contains information on covariates, which can be either captured on a per-person basis, or aggregated across the cohort(s).

By default covariates refer to a specific time period, with for example different covariate IDs for whether a diagnosis code was observed in the year before and month before index date. However, a CovariateData can also be temporal, meaning that next to a covariate ID there is also a time ID, which identifies the (user specified) time window the covariate was captured.

A CovariateData object is typically created using [getDbCovariateData](#), can only be saved using [saveCovariateData](#), and loaded using [loadCovariateData](#).

Usage

```
## S4 method for signature 'CovariateData'
show(object)

## S4 method for signature 'CovariateData'
summary(object)
```

Arguments

object An object of class ‘CovariateData’.

See Also

[isCovariateData](#), [isAggregatedCovariateData](#), [isTemporalCovariateData](#)

createAnalysisDetails *Create detailed covariate settings*

Description

Create detailed covariate settings

Usage

```
createAnalysisDetails(
  analysisId,
  sqlFileName,
  parameters,
  includedCovariateConceptIds = c(),
  addDescendantsToInclude = FALSE,
  excludedCovariateConceptIds = c(),
  addDescendantsToExclude = FALSE,
  includedCovariateIds = c()
)
```

Arguments

analysisId	An integer between 0 and 999 that uniquely identifies this analysis.
sqlFileName	The name of the parameterized SQL file embedded in the featureExtraction package.
parameters	The list of parameter values used to render the template SQL.
includedCovariateConceptIds	A list of concept IDs that should be used to construct covariates.
addDescendantsToInclude	Should descendant concept IDs be added to the list of concepts to include?
excludedCovariateConceptIds	A list of concept IDs that should NOT be used to construct covariates.
addDescendantsToExclude	Should descendant concept IDs be added to the list of concepts to exclude?
includedCovariateIds	A list of covariate IDs that should be restricted to.

Details

creates an object specifying in detail how covariates should be constructed from data in the CDM model. Warning: this function is for advanced users only.

Value

An object of type analysisDetail, to be used in [createDetailedCovariateSettings](#) or [createDetailedTemporalC](#)

Examples

```
analysisDetails <- createAnalysisDetails(analysisId = 1,
                                         sqlFileName = "DemographicsGender.sql",
                                         parameters = list(analysisId = 1,
                                                             analysisName = "Gender",
                                                             domainId = "Demographics"),
                                         includedCovariateConceptIds = c(),
                                         addDescendantsToInclude = FALSE,
                                         excludedCovariateConceptIds = c(),
                                         addDescendantsToExclude = FALSE,
                                         includedCovariateIds = c())
```

```
createCohortAttrCovariateSettings
```

Create cohort attribute covariate settings

Description

Create cohort attribute covariate settings

Usage

```
createCohortAttrCovariateSettings(
  analysisId = -1,
  attrDatabaseSchema,
  attrDefinitionTable = "attribute_definition",
  cohortAttrTable = "cohort_attribute",
  includeAttrIds = c(),
  isBinary = FALSE,
  missingMeansZero = FALSE
)
```

Arguments

analysisId A unique identifier for this analysis.

attrDatabaseSchema The database schema where the attribute definition and cohort attribute table can be found.

attrDefinitionTable The name of the attribute definition table.

cohortAttrTable The name of the cohort attribute table.

includeAttrIds (optional) A list of attribute definition IDs to restrict to.

isBinary Needed for aggregation: Are these binary variables? Binary variables should only have the values 0 or 1.

missingMeansZero Needed for aggregation: For continuous values, should missing values be interpreted as 0?

Details

Creates an object specifying where the cohort attributes can be found to construct covariates. The attributes should be defined in a table with the same structure as the `attribute_definition` table in the Common Data Model. It should at least have these columns:

attribute_definition_id A unique identifier of type integer.

attribute_name A short description of the attribute.

The cohort attributes themselves should be stored in a table with the same format as the `cohort_attribute` table in the Common Data Model. It should at least have these columns:

cohort_definition_id A key to link to the cohort table.

subject_id A key to link to the cohort table.

cohort_start_date A key to link to the cohort table.

attribute_definition_id An foreign key linking to the attribute definition table.

value_as_number A real number.

Value

An object of type `covariateSettings`, to be used in other functions.

createCovariateSettings

Create covariate settings

Description

Create covariate settings

Usage

```
createCovariateSettings(
  useDemographicsGender = FALSE,
  useDemographicsAge = FALSE,
  useDemographicsAgeGroup = FALSE,
  useDemographicsRace = FALSE,
  useDemographicsEthnicity = FALSE,
  useDemographicsIndexYear = FALSE,
  useDemographicsIndexMonth = FALSE,
  useDemographicsPriorObservationTime = FALSE,
  useDemographicsPostObservationTime = FALSE,
  useDemographicsTimeInCohort = FALSE,
  useDemographicsIndexYearMonth = FALSE,
  useConditionOccurrenceAnyTimePrior = FALSE,
  useConditionOccurrenceLongTerm = FALSE,
  useConditionOccurrenceMediumTerm = FALSE,
  useConditionOccurrenceShortTerm = FALSE,
  useConditionOccurrencePrimaryInpatientAnyTimePrior = FALSE,
  useConditionOccurrencePrimaryInpatientLongTerm = FALSE,
  useConditionOccurrencePrimaryInpatientMediumTerm = FALSE,
  useConditionOccurrencePrimaryInpatientShortTerm = FALSE,
  useConditionEraAnyTimePrior = FALSE,
  useConditionEraLongTerm = FALSE,
  useConditionEraMediumTerm = FALSE,
  useConditionEraShortTerm = FALSE,
  useConditionEraOverlapping = FALSE,
  useConditionEraStartLongTerm = FALSE,
  useConditionEraStartMediumTerm = FALSE,
  useConditionEraStartShortTerm = FALSE,
  useConditionGroupEraAnyTimePrior = FALSE,
  useConditionGroupEraLongTerm = FALSE,
  useConditionGroupEraMediumTerm = FALSE,
  useConditionGroupEraShortTerm = FALSE,
  useConditionGroupEraOverlapping = FALSE,
  useConditionGroupEraStartLongTerm = FALSE,
  useConditionGroupEraStartMediumTerm = FALSE,
  useConditionGroupEraStartShortTerm = FALSE,
  useDrugExposureAnyTimePrior = FALSE,
  useDrugExposureLongTerm = FALSE,
  useDrugExposureMediumTerm = FALSE,
  useDrugExposureShortTerm = FALSE,
  useDrugEraAnyTimePrior = FALSE,
```

```
useDrugEraLongTerm = FALSE,
useDrugEraMediumTerm = FALSE,
useDrugEraShortTerm = FALSE,
useDrugEraOverlapping = FALSE,
useDrugEraStartLongTerm = FALSE,
useDrugEraStartMediumTerm = FALSE,
useDrugEraStartShortTerm = FALSE,
useDrugGroupEraAnyTimePrior = FALSE,
useDrugGroupEraLongTerm = FALSE,
useDrugGroupEraMediumTerm = FALSE,
useDrugGroupEraShortTerm = FALSE,
useDrugGroupEraOverlapping = FALSE,
useDrugGroupEraStartLongTerm = FALSE,
useDrugGroupEraStartMediumTerm = FALSE,
useDrugGroupEraStartShortTerm = FALSE,
useProcedureOccurrenceAnyTimePrior = FALSE,
useProcedureOccurrenceLongTerm = FALSE,
useProcedureOccurrenceMediumTerm = FALSE,
useProcedureOccurrenceShortTerm = FALSE,
useDeviceExposureAnyTimePrior = FALSE,
useDeviceExposureLongTerm = FALSE,
useDeviceExposureMediumTerm = FALSE,
useDeviceExposureShortTerm = FALSE,
useMeasurementAnyTimePrior = FALSE,
useMeasurementLongTerm = FALSE,
useMeasurementMediumTerm = FALSE,
useMeasurementShortTerm = FALSE,
useMeasurementValueAnyTimePrior = FALSE,
useMeasurementValueLongTerm = FALSE,
useMeasurementValueMediumTerm = FALSE,
useMeasurementValueShortTerm = FALSE,
useMeasurementRangeGroupAnyTimePrior = FALSE,
useMeasurementRangeGroupLongTerm = FALSE,
useMeasurementRangeGroupMediumTerm = FALSE,
useMeasurementRangeGroupShortTerm = FALSE,
useObservationAnyTimePrior = FALSE,
useObservationLongTerm = FALSE,
useObservationMediumTerm = FALSE,
useObservationShortTerm = FALSE,
useCharlsonIndex = FALSE,
useDcsi = FALSE,
useChads2 = FALSE,
useChads2Vasc = FALSE,
useHfrs = FALSE,
useDistinctConditionCountLongTerm = FALSE,
useDistinctConditionCountMediumTerm = FALSE,
useDistinctConditionCountShortTerm = FALSE,
useDistinctIngredientCountLongTerm = FALSE,
useDistinctIngredientCountMediumTerm = FALSE,
useDistinctIngredientCountShortTerm = FALSE,
useDistinctProcedureCountLongTerm = FALSE,
useDistinctProcedureCountMediumTerm = FALSE,
```



```

useDistinctProcedureCountShortTerm = FALSE,
useDistinctMeasurementCountLongTerm = FALSE,
useDistinctMeasurementCountMediumTerm = FALSE,
useDistinctMeasurementCountShortTerm = FALSE,
useDistinctObservationCountLongTerm = FALSE,
useDistinctObservationCountMediumTerm = FALSE,
useDistinctObservationCountShortTerm = FALSE,
useVisitCountLongTerm = FALSE,
useVisitCountMediumTerm = FALSE,
useVisitCountShortTerm = FALSE,
useVisitConceptCountLongTerm = FALSE,
useVisitConceptCountMediumTerm = FALSE,
useVisitConceptCountShortTerm = FALSE,
longTermStartDays = -365,
mediumTermStartDays = -180,
shortTermStartDays = -30,
endDays = 0,
includedCovariateConceptIds = c(),
addDescendantsToInclude = FALSE,
excludedCovariateConceptIds = c(),
addDescendantsToExclude = FALSE,
includedCovariateIds = c()
)

```

Arguments

```

useDemographicsGender
    Gender of the subject. (analysis ID 1)
useDemographicsAge
    Age of the subject on the index date (in years). (analysis ID 2)
useDemographicsAgeGroup
    Age of the subject on the index date (in 5 year age groups) (analysis ID 3)
useDemographicsRace
    Race of the subject. (analysis ID 4)
useDemographicsEthnicity
    Ethnicity of the subject. (analysis ID 5)
useDemographicsIndexYear
    Year of the index date. (analysis ID 6)
useDemographicsIndexMonth
    Month of the index date. (analysis ID 7)
useDemographicsPriorObservationTime
    Number of continuous days of observation time preceding the index date. (analysis ID 8)
useDemographicsPostObservationTime
    Number of continuous days of observation time following the index date. (analysis ID 9)
useDemographicsTimeInCohort
    Number of days of observation time during cohort period. (analysis ID 10)
useDemographicsIndexYearMonth
    Both calendar year and month of the index date in a single variable. (analysis ID 11)

```

useConditionOccurrenceAnyTimePrior
One covariate per condition in the condition_occurrence table starting any time prior to index. (analysis ID 101)

useConditionOccurrenceLongTerm
One covariate per condition in the condition_occurrence table starting in the long term window. (analysis ID 102)

useConditionOccurrenceMediumTerm
One covariate per condition in the condition_occurrence table starting in the medium term window. (analysis ID 103)

useConditionOccurrenceShortTerm
One covariate per condition in the condition_occurrence table starting in the short term window. (analysis ID 104)

useConditionOccurrencePrimaryInpatientAnyTimePrior
One covariate per condition observed as a primary diagnosis in an inpatient setting in the condition_occurrence table starting any time prior to index. (analysis ID 105)

useConditionOccurrencePrimaryInpatientLongTerm
One covariate per condition observed as a primary diagnosis in an inpatient setting in the condition_occurrence table starting in the long term window. (analysis ID 106)

useConditionOccurrencePrimaryInpatientMediumTerm
One covariate per condition observed as a primary diagnosis in an inpatient setting in the condition_occurrence table starting in the medium term window. (analysis ID 107)

useConditionOccurrencePrimaryInpatientShortTerm
One covariate per condition observed as a primary diagnosis in an inpatient setting in the condition_occurrence table starting in the short term window. (analysis ID 108)

useConditionEraAnyTimePrior
One covariate per condition in the condition_era table overlapping with any time prior to index. (analysis ID 201)

useConditionEraLongTerm
One covariate per condition in the condition_era table overlapping with any part of the long term window. (analysis ID 202)

useConditionEraMediumTerm
One covariate per condition in the condition_era table overlapping with any part of the medium term window. (analysis ID 203)

useConditionEraShortTerm
One covariate per condition in the condition_era table overlapping with any part of the short term window. (analysis ID 204)

useConditionEraOverlapping
One covariate per condition in the condition_era table overlapping with the end of the risk window. (analysis ID 205)

useConditionEraStartLongTerm
One covariate per condition in the condition_era table starting in the long term window. (analysis ID 206)

useConditionEraStartMediumTerm
One covariate per condition in the condition_era table starting in the medium term window. (analysis ID 207)

useConditionEraStartShortTerm	One covariate per condition in the condition_era table starting in the short term window. (analysis ID 208)
useConditionGroupEraAnyTimePrior	One covariate per condition era rolled up to groups in the condition_era table overlapping with any time prior to index. (analysis ID 209)
useConditionGroupEraLongTerm	One covariate per condition era rolled up to groups in the condition_era table overlapping with any part of the long term window. (analysis ID 210)
useConditionGroupEraMediumTerm	One covariate per condition era rolled up to groups in the condition_era table overlapping with any part of the medium term window. (analysis ID 211)
useConditionGroupEraShortTerm	One covariate per condition era rolled up to groups in the condition_era table overlapping with any part of the short term window. (analysis ID 212)
useConditionGroupEraOverlapping	One covariate per condition era rolled up to groups in the condition_era table overlapping with the end of the risk window. (analysis ID 213)
useConditionGroupEraStartLongTerm	One covariate per condition era rolled up to groups in the condition_era table starting in the long term window. (analysis ID 214)
useConditionGroupEraStartMediumTerm	One covariate per condition era rolled up to groups in the condition_era table starting in the medium term window. (analysis ID 215)
useConditionGroupEraStartShortTerm	One covariate per condition era rolled up to groups in the condition_era table starting in the short term window. (analysis ID 216)
useDrugExposureAnyTimePrior	One covariate per drug in the drug_exposure table starting any time prior to index. (analysis ID 301)
useDrugExposureLongTerm	One covariate per drug in the drug_exposure table starting in the long term window. (analysis ID 302)
useDrugExposureMediumTerm	One covariate per drug in the drug_exposure table starting in the medium term window. (analysis ID 303)
useDrugExposureShortTerm	One covariate per drug in the drug_exposure table starting in the short term window. (analysis ID 304)
useDrugEraAnyTimePrior	One covariate per drug in the drug_era table overlapping with any time prior to index. (analysis ID 401)
useDrugEraLongTerm	One covariate per drug in the drug_era table overlapping with any part of the long term window. (analysis ID 402)
useDrugEraMediumTerm	One covariate per drug in the drug_era table overlapping with any part of the medium term window. (analysis ID 403)
useDrugEraShortTerm	One covariate per drug in the drug_era table overlapping with any part of the short window. (analysis ID 404)

useDrugEraOverlapping
 One covariate per drug in the drug_era table overlapping with the end of the risk window. (analysis ID 405)

useDrugEraStartLongTerm
 One covariate per drug in the drug_era table starting in the long term window. (analysis ID 406)

useDrugEraStartMediumTerm
 One covariate per drug in the drug_era table starting in the medium term window. (analysis ID 407)

useDrugEraStartShortTerm
 One covariate per drug in the drug_era table starting in the long short window. (analysis ID 408)

useDrugGroupEraAnyTimePrior
 One covariate per drug rolled up to ATC groups in the drug_era table overlapping with any time prior to index. (analysis ID 409)

useDrugGroupEraLongTerm
 One covariate per drug rolled up to ATC groups in the drug_era table overlapping with any part of the long term window. (analysis ID 410)

useDrugGroupEraMediumTerm
 One covariate per drug rolled up to ATC groups in the drug_era table overlapping with any part of the medium term window. (analysis ID 411)

useDrugGroupEraShortTerm
 One covariate per drug rolled up to ATC groups in the drug_era table overlapping with any part of the short term window. (analysis ID 412)

useDrugGroupEraOverlapping
 One covariate per drug rolled up to ATC groups in the drug_era table overlapping with the end of the risk window. (analysis ID 413)

useDrugGroupEraStartLongTerm
 One covariate per drug rolled up to ATC groups in the drug_era table starting in the long term window. (analysis ID 414)

useDrugGroupEraStartMediumTerm
 One covariate per drug rolled up to ATC groups in the drug_era table starting in the medium term window. (analysis ID 415)

useDrugGroupEraStartShortTerm
 One covariate per drug rolled up to ATC groups in the drug_era table starting in the short term window. (analysis ID 416)

useProcedureOccurrenceAnyTimePrior
 One covariate per procedure in the procedure_occurrence table any time prior to index. (analysis ID 501)

useProcedureOccurrenceLongTerm
 One covariate per procedure in the procedure_occurrence table in the long term window. (analysis ID 502)

useProcedureOccurrenceMediumTerm
 One covariate per procedure in the procedure_occurrence table in the medium term window. (analysis ID 503)

useProcedureOccurrenceShortTerm
 One covariate per procedure in the procedure_occurrence table in the short term window. (analysis ID 504)

useDeviceExposureAnyTimePrior
 One covariate per device in the device exposure table starting any time prior to index. (analysis ID 601)

useDeviceExposureLongTerm	One covariate per device in the device exposure table starting in the long term window. (analysis ID 602)
useDeviceExposureMediumTerm	One covariate per device in the device exposure table starting in the medium term window. (analysis ID 603)
useDeviceExposureShortTerm	One covariate per device in the device exposure table starting in the short term window. (analysis ID 604)
useMeasurementAnyTimePrior	One covariate per measurement in the measurement table any time prior to index. (analysis ID 701)
useMeasurementLongTerm	One covariate per measurement in the measurement table in the long term window. (analysis ID 702)
useMeasurementMediumTerm	One covariate per measurement in the measurement table in the medium term window. (analysis ID 703)
useMeasurementShortTerm	One covariate per measurement in the measurement table in the short term window. (analysis ID 704)
useMeasurementValueAnyTimePrior	One covariate containing the value per measurement-unit combination any time prior to index. (analysis ID 705)
useMeasurementValueLongTerm	One covariate containing the value per measurement-unit combination in the long term window. (analysis ID 706)
useMeasurementValueMediumTerm	One covariate containing the value per measurement-unit combination in the medium term window. (analysis ID 707)
useMeasurementValueShortTerm	One covariate containing the value per measurement-unit combination in the short term window. (analysis ID 708)
useMeasurementRangeGroupAnyTimePrior	Covariates indicating whether measurements are below, within, or above normal range any time prior to index. (analysis ID 709)
useMeasurementRangeGroupLongTerm	Covariates indicating whether measurements are below, within, or above normal range in the long term window. (analysis ID 710)
useMeasurementRangeGroupMediumTerm	Covariates indicating whether measurements are below, within, or above normal range in the medium term window. (analysis ID 711)
useMeasurementRangeGroupShortTerm	Covariates indicating whether measurements are below, within, or above normal range in the short term window. (analysis ID 712)
useObservationAnyTimePrior	One covariate per observation in the observation table any time prior to index. (analysis ID 801)
useObservationLongTerm	One covariate per observation in the observation table in the long term window. (analysis ID 802)

<code>useObservationMediumTerm</code>	One covariate per observation in the observation table in the medium term window. (analysis ID 803)
<code>useObservationShortTerm</code>	One covariate per observation in the observation table in the short term window. (analysis ID 804)
<code>useCharlsonIndex</code>	The Charlson comorbidity index (Romano adaptation) using all conditions prior to the window end. (analysis ID 901)
<code>useDcsi</code>	The Diabetes Comorbidity Severity Index (DCSI) using all conditions prior to the window end. (analysis ID 902)
<code>useChads2</code>	The CHADS2 score using all conditions prior to the window end. (analysis ID 903)
<code>useChads2Vasc</code>	The CHADS2VAsC score using all conditions prior to the window end. (analysis ID 904)
<code>useHfrs</code>	The Hospital Frailty Risk Score score using all conditions prior to the window end. (analysis ID 926)
<code>useDistinctConditionCountLongTerm</code>	The number of distinct condition concepts observed in the long term window. (analysis ID 905)
<code>useDistinctConditionCountMediumTerm</code>	The number of distinct condition concepts observed in the medium term window. (analysis ID 906)
<code>useDistinctConditionCountShortTerm</code>	The number of distinct condition concepts observed in the short term window. (analysis ID 907)
<code>useDistinctIngredientCountLongTerm</code>	The number of distinct ingredients observed in the long term window. (analysis ID 908)
<code>useDistinctIngredientCountMediumTerm</code>	The number of distinct ingredients observed in the medium term window. (analysis ID 909)
<code>useDistinctIngredientCountShortTerm</code>	The number of distinct ingredients observed in the short term window. (analysis ID 910)
<code>useDistinctProcedureCountLongTerm</code>	The number of distinct procedures observed in the long term window. (analysis ID 911)
<code>useDistinctProcedureCountMediumTerm</code>	The number of distinct procedures observed in the medium term window. (analysis ID 912)
<code>useDistinctProcedureCountShortTerm</code>	The number of distinct procedures observed in the short term window. (analysis ID 913)
<code>useDistinctMeasurementCountLongTerm</code>	The number of distinct measurements observed in the long term window. (analysis ID 914)
<code>useDistinctMeasurementCountMediumTerm</code>	The number of distinct measurements observed in the medium term window. (analysis ID 915)

useDistinctMeasurementCountShortTerm	The number of distinct measurements observed in the short term window. (analysis ID 916)
useDistinctObservationCountLongTerm	The number of distinct observations observed in the long term window. (analysis ID 917)
useDistinctObservationCountMediumTerm	The number of distinct observations observed in the medium term window. (analysis ID 918)
useDistinctObservationCountShortTerm	The number of distinct observations observed in the short term window. (analysis ID 919)
useVisitCountLongTerm	The number of visits observed in the long term window. (analysis ID 920)
useVisitCountMediumTerm	The number of visits observed in the medium term window. (analysis ID 921)
useVisitCountShortTerm	The number of visits observed in the short term window. (analysis ID 922)
useVisitConceptCountLongTerm	The number of visits observed in the long term window, stratified by visit concept ID. (analysis ID 923)
useVisitConceptCountMediumTerm	The number of visits observed in the medium term window, stratified by visit concept ID. (analysis ID 924)
useVisitConceptCountShortTerm	The number of visits observed in the short term window, stratified by visit concept ID. (analysis ID 925)
longTermStartDays	What is the start day (relative to the index date) of the long-term window?
mediumTermStartDays	What is the start day (relative to the index date) of the medium-term window?
shortTermStartDays	What is the start day (relative to the index date) of the short-term window?
endDays	What is the end day (relative to the index date) of the window?
includedCovariateConceptIds	A list of concept IDs that should be used to construct covariates.
addDescendantsToInclude	Should descendant concept IDs be added to the list of concepts to include?
excludedCovariateConceptIds	A list of concept IDs that should NOT be used to construct covariates.
addDescendantsToExclude	Should descendant concept IDs be added to the list of concepts to exclude?
includedCovariateIds	A list of covariate IDs that should be restricted to.

Details

creates an object specifying how covariates should be constructed from data in the CDM model.

An object of type `covariateSettings`, to be used in other functions.

```
settings <- createCovariateSettings(useDemographicsGender = TRUE,
  useDemographicsAge = FALSE,
  useDemographicsAgeGroup = TRUE,
  useDemographicsRace = TRUE,
  useDemographicsEthnicity = TRUE,
  useDemographicsIndexYear = TRUE,
  useDemographicsIndexMonth = TRUE,
  useDemographicsPriorObservationTime = FALSE,
  useDemographicsPostObservationTime = FALSE,
  useDemographicsTimeInCohort = FALSE,
  useDemographicsIndexYearMonth = FALSE,
  useConditionOccurrenceAnyTimePrior = FALSE,
  useConditionOccurrenceLongTerm = FALSE,
  useConditionOccurrenceMediumTerm = FALSE,
  useConditionOccurrenceShortTerm = FALSE,
  useConditionOccurrencePrimaryInpatientAnyTimePrior = FALSE,
  useConditionOccurrencePrimaryInpatientLongTerm = FALSE,
  useConditionOccurrencePrimaryInpatientMediumTerm = FALSE,
  useConditionOccurrencePrimaryInpatientShortTerm = FALSE,
  useConditionEraAnyTimePrior = FALSE,
  useConditionEraLongTerm = FALSE,
  useConditionEraMediumTerm = FALSE,
  useConditionEraShortTerm = FALSE,
  useConditionEraOverlapping = FALSE,
  useConditionEraStartLongTerm = FALSE,
  useConditionEraStartMediumTerm = FALSE,
  useConditionEraStartShortTerm = FALSE,
  useConditionGroupEraAnyTimePrior = FALSE,
  useConditionGroupEraLongTerm = TRUE,
  useConditionGroupEraMediumTerm = FALSE,
  useConditionGroupEraShortTerm = TRUE,
  useConditionGroupEraOverlapping = FALSE,
  useConditionGroupEraStartLongTerm = FALSE,
  useConditionGroupEraStartMediumTerm = FALSE,
  useConditionGroupEraStartShortTerm = FALSE,
  useDrugExposureAnyTimePrior = FALSE,
  useDrugExposureLongTerm = FALSE,
  useDrugExposureMediumTerm = FALSE,
  useDrugExposureShortTerm = FALSE,
  useDrugEraAnyTimePrior = FALSE,
  useDrugEraLongTerm = FALSE,
  useDrugEraMediumTerm = FALSE,
  useDrugEraShortTerm = FALSE,
  useDrugEraOverlapping = FALSE,
  useDrugEraStartLongTerm = FALSE,
  useDrugEraStartMediumTerm = FALSE,
  useDrugEraStartShortTerm = FALSE,
  useDrugGroupEraAnyTimePrior = FALSE,
  useDrugGroupEraLongTerm = TRUE,
  useDrugGroupEraMediumTerm = FALSE,
  useDrugGroupEraShortTerm = TRUE,
```



```
useDrugGroupEraOverlapping = TRUE,
useDrugGroupEraStartLongTerm = FALSE,
useDrugGroupEraStartMediumTerm = FALSE,
useDrugGroupEraStartShortTerm = FALSE,
useProcedureOccurrenceAnyTimePrior = FALSE,
useProcedureOccurrenceLongTerm = TRUE,
useProcedureOccurrenceMediumTerm = FALSE,
useProcedureOccurrenceShortTerm = TRUE,
useDeviceExposureAnyTimePrior = FALSE,
useDeviceExposureLongTerm = TRUE,
useDeviceExposureMediumTerm = FALSE,
useDeviceExposureShortTerm = TRUE,
useMeasurementAnyTimePrior = FALSE,
useMeasurementLongTerm = TRUE,
useMeasurementMediumTerm = FALSE,
useMeasurementShortTerm = TRUE,
useMeasurementValueAnyTimePrior = FALSE,
useMeasurementValueLongTerm = FALSE,
useMeasurementValueMediumTerm = FALSE,
useMeasurementValueShortTerm = FALSE,
useMeasurementRangeGroupAnyTimePrior = FALSE,
useMeasurementRangeGroupLongTerm = TRUE,
useMeasurementRangeGroupMediumTerm = FALSE,
useMeasurementRangeGroupShortTerm = FALSE,
useObservationAnyTimePrior = FALSE,
useObservationLongTerm = TRUE,
useObservationMediumTerm = FALSE,
useObservationShortTerm = TRUE,
useCharlsonIndex = TRUE,
useDcsi = TRUE,
useChads2 = TRUE,
useChads2Vasc = TRUE,
useHfrs = FALSE,
useDistinctConditionCountLongTerm = FALSE,
useDistinctConditionCountMediumTerm = FALSE,
useDistinctConditionCountShortTerm = FALSE,
useDistinctIngredientCountLongTerm = FALSE,
useDistinctIngredientCountMediumTerm = FALSE,
useDistinctIngredientCountShortTerm = FALSE,
useDistinctProcedureCountLongTerm = FALSE,
useDistinctProcedureCountMediumTerm = FALSE,
useDistinctProcedureCountShortTerm = FALSE,
useDistinctMeasurementCountLongTerm = FALSE,
useDistinctMeasurementCountMediumTerm = FALSE,
useDistinctMeasurementCountShortTerm = FALSE,
useDistinctObservationCountLongTerm = FALSE,
useDistinctObservationCountMediumTerm = FALSE,
useDistinctObservationCountShortTerm = FALSE,
useVisitCountLongTerm = FALSE,
useVisitCountMediumTerm = FALSE,
useVisitCountShortTerm = FALSE,
useVisitConceptCountLongTerm = FALSE,
useVisitConceptCountMediumTerm = FALSE,
useVisitConceptCountShortTerm = FALSE,
longTermStartDays = -365,
mediumTermStartDays = -180,
shortTermStartDays = -30,
```

```

endDays = 0,
includedCovariateConceptIds = c(),
addDescendantsToInclude = FALSE,
excludedCovariateConceptIds = c(),
addDescendantsToExclude = FALSE,
includedCovariateIds = c())

```

```
createDefaultCovariateSettings
```

Create default covariate settings

Description

Create default covariate settings

Usage

```

createDefaultCovariateSettings(
  includedCovariateConceptIds = c(),
  addDescendantsToInclude = FALSE,
  excludedCovariateConceptIds = c(),
  addDescendantsToExclude = FALSE,
  includedCovariateIds = c()
)

```

Arguments

includedCovariateConceptIds
A list of concept IDs that should be used to construct covariates.

addDescendantsToInclude
Should descendant concept IDs be added to the list of concepts to include?

excludedCovariateConceptIds
A list of concept IDs that should NOT be used to construct covariates.

addDescendantsToExclude
Should descendant concept IDs be added to the list of concepts to exclude?

includedCovariateIds
A list of covariate IDs that should be restricted to.

Value

An object of type `covariateSettings`, to be used in other functions.

```
createDefaultTemporalCovariateSettings
      Create default covariate settings
```

Description

Create default covariate settings

Usage

```
createDefaultTemporalCovariateSettings(
  includedCovariateConceptIds = c(),
  addDescendantsToInclude = FALSE,
  excludedCovariateConceptIds = c(),
  addDescendantsToExclude = FALSE,
  includedCovariateIds = c()
)
```

Arguments

`includedCovariateConceptIds`
A list of concept IDs that should be used to construct covariates.

`addDescendantsToInclude`
Should descendant concept IDs be added to the list of concepts to include?

`excludedCovariateConceptIds`
A list of concept IDs that should NOT be used to construct covariates.

`addDescendantsToExclude`
Should descendant concept IDs be added to the list of concepts to exclude?

`includedCovariateIds`
A list of covariate IDs that should be restricted to.

Value

An object of type `covariateSettings`, to be used in other functions.

```
createDetailedCovariateSettings
      Create detailed covariate settings
```

Description

Create detailed covariate settings

Usage

```
createDetailedCovariateSettings(analyses = list())
```

Arguments

`analyses` A list of `analysisDetail` objects as created using [createAnalysisDetails](#).

Details

creates an object specifying in detail how covariates should be constructed from data in the CDM model. Warning: this function is for advanced users only.

Value

An object of type covariateSettings, to be used in other functions.

```
createDetailedTemporalCovariateSettings
```

Create detailed temporal covariate settings

Description

Create detailed temporal covariate settings

Usage

```
createDetailedTemporalCovariateSettings(
  analyses = list(),
  temporalStartDays = -365:-1,
  temporalEndDays = -365:-1
)
```

Arguments

analyses	A list of analysis detail objects as created using createAnalysisDetails .
temporalStartDays	A list of integers representing the start of a time period, relative to the index date. 0 indicates the index date, -1 indicates the day before the index date, etc. The start day is included in the time period.
temporalEndDays	A list of integers representing the end of a time period, relative to the index date. 0 indicates the index date, -1 indicates the day before the index date, etc. The end day is included in the time period.

Details

creates an object specifying in detail how temporal covariates should be constructed from data in the CDM model. Warning: this function is for advanced users only.

Value

An object of type covariateSettings, to be used in other functions.

createTable1	<i>Create a table 1</i>
--------------	-------------------------

Description

Creates a formatted table of cohort characteristics, to be included in publications or reports. Allows for creating a table describing a single cohort, or a table comparing two cohorts.

Usage

```
createTable1(
  covariateData1,
  covariateData2 = NULL,
  specifications = getDefaultTable1Specifications(),
  output = "two columns",
  showCounts = FALSE,
  showPercent = TRUE,
  percentDigits = 1,
  valueDigits = 1,
  stdDiffDigits = 2
)
```

Arguments

covariateData1	The covariate data of the cohort to be included in the table.
covariateData2	The covariate data of the cohort to also be included, when comparing two cohorts.
specifications	Specifications of which covariates to display, and how.
output	The output format for the table. Options are output = "two columns", output = "one column", or output = "list".
showCounts	Show the number of cohort entries having the binary covariate?
showPercent	Show the percentage of cohort entries having the binary covariate?
percentDigits	Number of digits to be used for percentages.
valueDigits	Number of digits to be used for the values of continuous variables.
stdDiffDigits	Number of digits to be used for the standardized differences.

Value

A data frame, or, when output = "list" a list of two data frames.

```
createTable1CovariateSettings
```

Create covariate settings for a table 1

Description

Creates a covariate settings object for generating only those covariates that will be included in a table 1. This function works by filtering the covariateSettings object for the covariates in the specifications object.

Usage

```
createTable1CovariateSettings(
  specifications = getDefaultTable1Specifications(),
  covariateSettings = createDefaultCovariateSettings(),
  includedCovariateConceptIds = c(),
  addDescendantsToInclude = FALSE,
  excludedCovariateConceptIds = c(),
  addDescendantsToExclude = FALSE,
  includedCovariateIds = c()
)
```

Arguments

specifications A specifications object for generating a table using the [createTable1](#) function.

covariateSettings The covariate settings object to use as the basis for the filtered covariate settings.

includedCovariateConceptIds A list of concept IDs that should be used to construct covariates.

addDescendantsToInclude Should descendant concept IDs be added to the list of concepts to include?

excludedCovariateConceptIds A list of concept IDs that should NOT be used to construct covariates.

addDescendantsToExclude Should descendant concept IDs be added to the list of concepts to exclude?

includedCovariateIds A list of covariate IDs that should be restricted to.

Value

A covariate settings object, for example to be used when calling the [getDbCovariateData](#) function.

```
createTemporalCovariateSettings
    Create covariate settings
```

Description

Create covariate settings

Usage

```
createTemporalCovariateSettings(
  useDemographicsGender = FALSE,
  useDemographicsAge = FALSE,
  useDemographicsAgeGroup = FALSE,
  useDemographicsRace = FALSE,
  useDemographicsEthnicity = FALSE,
  useDemographicsIndexYear = FALSE,
  useDemographicsIndexMonth = FALSE,
  useDemographicsPriorObservationTime = FALSE,
  useDemographicsPostObservationTime = FALSE,
  useDemographicsTimeInCohort = FALSE,
  useDemographicsIndexYearMonth = FALSE,
  useConditionOccurrence = FALSE,
  useConditionOccurrencePrimaryInpatient = FALSE,
  useConditionEraStart = FALSE,
  useConditionEraOverlap = FALSE,
  useConditionEraGroupStart = FALSE,
  useConditionEraGroupOverlap = FALSE,
  useDrugExposure = FALSE,
  useDrugEraStart = FALSE,
  useDrugEraOverlap = FALSE,
  useDrugEraGroupStart = FALSE,
  useDrugEraGroupOverlap = FALSE,
  useProcedureOccurrence = FALSE,
  useDeviceExposure = FALSE,
  useMeasurement = FALSE,
  useMeasurementValue = FALSE,
  useMeasurementRangeGroup = FALSE,
  useObservation = FALSE,
  useCharlsonIndex = FALSE,
  useDcsi = FALSE,
  useChads2 = FALSE,
  useChads2Vasc = FALSE,
  useHfrs = FALSE,
  useDistinctConditionCount = FALSE,
  useDistinctIngredientCount = FALSE,
  useDistinctProcedureCount = FALSE,
  useDistinctMeasurementCount = FALSE,
  useDistinctObservationCount = FALSE,
  useVisitCount = FALSE,
  useVisitConceptCount = FALSE,
```

```

temporalStartDays = -365:-1,
temporalEndDays = -365:-1,
includedCovariateConceptIds = c(),
addDescendantsToInclude = FALSE,
excludedCovariateConceptIds = c(),
addDescendantsToExclude = FALSE,
includedCovariateIds = c()
)

```

Arguments

```

useDemographicsGender
    Gender of the subject. (analysis ID 1)
useDemographicsAge
    Age of the subject on the index date (in years). (analysis ID 2)
useDemographicsAgeGroup
    Age of the subject on the index date (in 5 year age groups) (analysis ID 3)
useDemographicsRace
    Race of the subject. (analysis ID 4)
useDemographicsEthnicity
    Ethnicity of the subject. (analysis ID 5)
useDemographicsIndexYear
    Year of the index date. (analysis ID 6)
useDemographicsIndexMonth
    Month of the index date. (analysis ID 7)
useDemographicsPriorObservationTime
    Number of days of observation time preceding the index date. (analysis ID 8)
useDemographicsPostObservationTime
    Number of days of observation time preceding the index date. (analysis ID 9)
useDemographicsTimeInCohort
    Number of days of observation time preceding the index date. (analysis ID 10)
useDemographicsIndexYearMonth
    Calendar month of the index date. (analysis ID 11)
useConditionOccurrence
    One covariate per condition in the condition_occurrence table starting in the
    time window. (analysis ID 101)
useConditionOccurrencePrimaryInpatient
    One covariate per condition observed as a primary diagnosis in an inpatient set-
    ting in the condition_occurrence table starting in the time window. (analysis ID
    102)
useConditionEraStart
    One covariate per condition in the condition_era table starting in the time win-
    dow. (analysis ID 201)
useConditionEraOverlap
    One covariate per condition in the condition_era table overlapping with any part
    of the time window. (analysis ID 202)
useConditionEraGroupStart
    One covariate per condition era rolled up to SNOMED groups in the condi-
    tion_era table starting in the time window. (analysis ID 203)

```


useConditionEraGroupOverlap	One covariate per condition era rolled up to SNOMED groups in the condition_era table overlapping with any part of the time window. (analysis ID 203)
useDrugExposure	One covariate per drug in the drug_exposure table starting in the time window. (analysis ID 301)
useDrugEraStart	One covariate per drug in the drug_era table starting in the time window. (analysis ID 401)
useDrugEraOverlap	One covariate per drug in the drug_era table overlapping with any part of the time window. (analysis ID 402)
useDrugEraGroupStart	One covariate per drug rolled up to ATC groups in the drug_era table starting in the time window. (analysis ID 403)
useDrugEraGroupOverlap	One covariate per drug rolled up to ATC groups in the drug_era table overlapping with any part of the time window. (analysis ID 403)
useProcedureOccurrence	One covariate per procedure in the procedure_occurrence table in the time window. (analysis ID 501)
useDeviceExposure	One covariate per device in the device exposure table starting in the time window. (analysis ID 601)
useMeasurement	One covariate per measurement in the measurement table in the time window. (analysis ID 701)
useMeasurementValue	One covariate containing the value per measurement-unit combination in the time window. If multiple values are found, the last is taken. (analysis ID 702)
useMeasurementRangeGroup	Covariates indicating whether measurements are below, within, or above normal range within the time period. (analysis ID 703)
useObservation	One covariate per observation in the observation table in the time window. (analysis ID 801)
useCharlsonIndex	The Charlson comorbidity index (Romano adaptation) using all conditions prior to the window end. (analysis ID 901)
useDcsi	The Diabetes Comorbidity Severity Index (DCSI) using all conditions prior to the window end. (analysis ID 902)
useChads2	The CHADS2 score using all conditions prior to the window end. (analysis ID 903)
useChads2Vasc	The CHADS2VAsC score using all conditions prior to the window end. (analysis ID 904)
useHfrs	The Hospital Frailty Risk Score score using all conditions prior to the window end. (analysis ID 926)
useDistinctConditionCount	The number of distinct condition concepts observed in the time window. (analysis ID 905)

Details

Value

Examples

[illegible]

```

useDemographicsPriorObservationTime = FALSE,
useDemographicsPostObservationTime = FALSE,
useDemographicsTimeInCohort = FALSE,
useDemographicsIndexYearMonth = FALSE,
useConditionOccurrence = FALSE,
useConditionOccurrencePrimaryInpatient = FALSE,
useConditionEraStart = FALSE,
useConditionEraOverlap = FALSE,
useConditionEraGroupStart = FALSE,
useConditionEraGroupOverlap = TRUE,
useDrugExposure = FALSE,
useDrugEraStart = FALSE,
useDrugEraOverlap = FALSE,
useDrugEraGroupStart = FALSE,
useDrugEraGroupOverlap = TRUE,
useProcedureOccurrence = TRUE,
useDeviceExposure = TRUE,
useMeasurement = TRUE,
useMeasurementValue = FALSE,
useMeasurementRangeGroup = TRUE,
useObservation = TRUE,
useCharlsonIndex = TRUE,
useDcsi = TRUE,
useChads2 = TRUE,
useChads2Vasc = TRUE,
useHfrs = FALSE,
useDistinctConditionCount = FALSE,
useDistinctIngredientCount = FALSE,
useDistinctProcedureCount = FALSE,
useDistinctMeasurementCount = FALSE,
useDistinctObservationCount = FALSE,
useVisitCount = FALSE,
useVisitConceptCount = FALSE,
temporalStartDays = -365:-1,
temporalEndDays = -365:-1,
includedCovariateConceptIds = c(),
addDescendantsToInclude = FALSE,
excludedCovariateConceptIds = c(),
addDescendantsToExclude = FALSE,
includedCovariateIds = c())

```

filterByRowId

Filter covariates by row ID

Description

Filter covariates by row ID

Usage

```
filterByRowId(covariateData, rowIds)
```

Arguments

covariateData An object of type CovariateData
 rowIds A vector containing the rowIds to keep.

Value

An object of type covariateData.

getDbCohortAttrCovariatesData

Getcovariate information from the database through the cohort_attribute table

Description

Constructs covariates using the cohort_attribute table.

Usage

```
getDbCohortAttrCovariatesData(
  connection,
  oracleTempSchema = NULL,
  cdmDatabaseSchema,
  cohortTable = "#cohort_person",
  cohortId = -1,
  cdmVersion = "5",
  rowIdField = "subject_id",
  covariateSettings,
  aggregated = FALSE
)
```

Arguments

connection A connection to the server containing the schema as created using the connect function in the DatabaseConnector package.
 oracleTempSchema A schema where temp tables can be created in Oracle.
 cdmDatabaseSchema The name of the database schema that contains the OMOP CDM instance. Requires read permissions to this database. On SQL Server, this should specify both the database and the schema, so for example 'cdm_instance.dbo'.
 cohortTable Name of the table holding the cohort for which we want to construct covariates. If it is a temp table, the name should have a hash prefix, e.g. '#temp_table'. If it is a non-temp table, it should include the database schema, e.g. 'cdm_database.cohort'.
 cohortId For which cohort ID should covariates be constructed? If set to -1, covariates will be constructed for all cohorts in the specified cohort table.
 cdmVersion The version of the Common Data Model used. Currently only cdmVersion = "5" is supported.

rowIdField	The name of the field in the cohort temp table that is to be used as the row_id field in the output table. This can be especially usefull if there is more than one period per person.
covariateSettings	An object of type covariateSettings as created using the createCohortAttrCovariateSettings function.
aggregated	Should aggregate statistics be computed instead of covariates per cohort entry?

Details

This function uses the data in the CDM to construct a large set of covariates for the provided cohort. The cohort is assumed to be in an existing temp table with these fields: 'subject_id', 'cohort_definition_id', 'cohort_start_date'. Optionally, an extra field can be added containing the unique identifier that will be used as rowID in the output. Typically, users don't call this function directly but rather use the [getDbCovariateData](#) function instead.

Value

Returns an object of type CovariateData, which is an Andromeda object containing information on the baseline covariates. Information about multiple outcomes can be captured at once for efficiency reasons. This object is a list with the following components:

covariates An ffdF object listing the baseline covariates per person in the cohorts. This is done using a sparse representation: covariates with a value of 0 are omitted to save space. The covariates object will have three columns: rowId, covariateId, and covariateValue. The rowId is usually equal to the person_id, unless specified otherwise in the rowIdField argument.

covariateRef A table describing the covariates that have been extracted.

. The CovariateData object will also have a metaData attribute, a list of objects with information on how the covariateData object was constructed.

getDbCovariateData	<i>Get covariate information from the database</i>
--------------------	--

Description

Uses one or several covariate builder functions to construct covariates.

Usage

```
getDbCovariateData(
  connectionDetails = NULL,
  connection = NULL,
  oracleTempSchema = NULL,
  cdmDatabaseSchema,
  cdmVersion = "5",
  cohortTable = "cohort",
  cohortDatabaseSchema = cdmDatabaseSchema,
  cohortTableIsTemp = FALSE,
  cohortId = -1,
  rowIdField = "subject_id",
```

```

    covariateSettings,
    aggregated = FALSE
  )

```

Arguments

connectionDetails	An R object of type connectionDetails created using the function createConnectionDetails in the DatabaseConnector package. Either the connection or connectionDetails argument should be specified.
connection	A connection to the server containing the schema as created using the connect function in the DatabaseConnector package. Either the connection or connectionDetails argument should be specified.
oracleTempSchema	A schema where temp tables can be created in Oracle.
cdmDatabaseSchema	The name of the database schema that contains the OMOP CDM instance. Requires read permissions to this database. On SQL Server, this should specify both the database and the schema, so for example 'cdm_instance.dbo'.
cdmVersion	Define the OMOP CDM version used: currently supported is "5".
cohortTable	Name of the (temp) table holding the cohort for which we want to construct covariates
cohortDatabaseSchema	If the cohort table is not a temp table, specify the database schema where the cohort table can be found. On SQL Server, this should specify both the database and the schema, so for example 'cdm_instance.dbo'.
cohortTableIsTemp	Is the cohort table a temp table?
cohortId	For which cohort ID should covariates be constructed? If set to -1, covariates will be constructed for all cohorts in the specified cohort table.
rowIdField	The name of the field in the cohort table that is to be used as the row_id field in the output table. This can be especially usefull if there is more than one period per person.
covariateSettings	Either an object of type covariateSettings as created using one of the create-Covariate functions, or a list of such objects.
aggregated	Should aggregate statistics be computed instead of covariates per cohort entry?

Details

This function uses the data in the CDM to construct a large set of covariates for the provided cohort. The cohort is assumed to be in an existing table with these fields: 'subject_id', 'cohort_definition_id', 'cohort_start_date'. Optionally, an extra field can be added containing the unique identifier that will be used as rowID in the output.

Value

Returns an object of type covariateData, containing information on the covariates.

getDbDefaultCovariateData

Get default covariate information from the database

Description

Constructs a large default set of covariates for one or more cohorts using data in the CDM schema. Includes covariates for all drugs, drug classes, condition, condition classes, procedures, observations, etc.

Usage

```
getDbDefaultCovariateData(
    connection,
    oracleTempSchema = NULL,
    cdmDatabaseSchema,
    cohortTable = "#cohort_person",
    cohortId = -1,
    cdmVersion = "5",
    rowIdField = "subject_id",
    covariateSettings,
    targetDatabaseSchema,
    targetCovariateTable,
    targetCovariateRefTable,
    targetAnalysisRefTable,
    aggregated = FALSE
)
```

Arguments

connection	A connection to the server containing the schema as created using the connect function in the DatabaseConnector package.
oracleTempSchema	A schema where temp tables can be created in Oracle.
cdmDatabaseSchema	The name of the database schema that contains the OMOP CDM instance. Requires read permissions to this database. On SQL Server, this should specify both the database and the schema, so for example 'cdm_instance.dbo'.
cohortTable	Name of the table holding the cohort for which we want to construct covariates. If it is a temp table, the name should have a hash prefix, e.g. '#temp_table'. If it is a non-temp table, it should include the database schema, e.g. 'cdm_database.cohort'.
cohortId	For which cohort ID should covariates be constructed? If set to -1, covariates will be constructed for all cohorts in the specified cohort table.
cdmVersion	The version of the Common Data Model used. Currently only cdmVersion = "5" is supported.
rowIdField	The name of the field in the cohort temp table that is to be used as the row_id field in the output table. This can be especially usefull if there is more than one period per person.

covariateSettings	Either an object of type covariateSettings as created using one of the create-Covariate functions, or a list of such objects.
targetDatabaseSchema	(Optional) The name of the database schema where the resulting covariates should be stored.
targetCovariateTable	(Optional) The name of the table where the resulting covariates will be stored. If not provided, results will be fetched to R. The table can be a permanent table in the targetDatabaseSchema or a temp table. If it is a temp table, do not specify targetDatabaseSchema.
targetCovariateRefTable	(Optional) The name of the table where the covariate reference will be stored.
targetAnalysisRefTable	(Optional) The name of the table where the analysis reference will be stored.
aggregated	Should aggregate statistics be computed instead of covariates per cohort entry?

Details

This function uses the data in the CDM to construct a large set of covariates for the provided cohort. The cohort is assumed to be in an existing temp table with these fields: 'subject_id', 'cohort_definition_id', 'cohort_start_date'. Optionally, an extra field can be added containing the unique identifier that will be used as rowID in the output. Typically, users don't call this function directly but rather use the [getDbCovariateData](#) function instead.

Value

Returns an object of type CovariateData, which is an Andromeda object containing information on the baseline covariates. Information about multiple outcomes can be captured at once for efficiency reasons. This object is a list with the following components:

covariates An ffdm object listing the baseline covariates per person in the cohorts. This is done using a sparse representation: covariates with a value of 0 are omitted to save space. The covariates object will have three columns: rowId, covariateId, and covariateValue. The rowId is usually equal to the person_id, unless specified otherwise in the rowIdField argument.

covariateRef A table describing the covariates that have been extracted.

. The CovariateData object will also have a metaData attribute, a list of objects with information on how the covariateData object was constructed.

```
getDefaultTable1Specifications
```

Get the default table 1 specifications

Description

Loads the default specifications for a table 1, to be used with the [createTable1](#) function.

Usage

```
getDefaultTable1Specifications()
```


Value

A specifications objects.

`isAggregatedCovariateData`

Check whether covariate data is aggregated

Description

Check whether covariate data is aggregated

Usage

```
isAggregatedCovariateData(x)
```

Arguments

<code>x</code>	The covariate data object to check.
----------------	-------------------------------------

Value

A logical value.

`isCovariateData`

Check whether an object is a CovariateData object

Description

Check whether an object is a CovariateData object

Usage

```
isCovariateData(x)
```

Arguments

<code>x</code>	The object to check.
----------------	----------------------

Value

A logical value.

isTemporalCovariateData

Check whether covariate data is temporal

Description

Check whether covariate data is temporal

Usage

```
isTemporalCovariateData(x)
```

Arguments

x The covariate data object to check.

Value

A logical value.

loadCovariateData

Load the covariate data from a folder

Description

loadCovariateData loads an object of type covariateData from a folder in the file system.

Usage

```
loadCovariateData(file, readOnly)
```

Arguments

file The name of the folder containing the data.
readOnly DEPRECATED: If true, the data is opened read only.

Details

The data will be written to a set of files in the folder specified by the user.

Value

An object of class CovariateData.

Examples

```
# todo
```

saveCovariateData	<i>Save the covariate data to folder</i>
-------------------	--

Description

saveCovariateData saves an object of type covariateData to folder.

Usage

```
saveCovariateData(covariateData, file)
```

Arguments

covariateData	An object of type covariateData as generated using getDbCovariateData.
file	The name of the folder where the data will be written. The folder should not yet exist.

Details

The data will be written to a set of files in the folder specified by the user.

Examples

```
# todo
```

tidyCovariateData	<i>Tidy covariate data</i>
-------------------	----------------------------

Description

Tidy covariate data

Usage

```
tidyCovariateData(
  covariateData,
  minFraction = 0.001,
  normalize = TRUE,
  removeRedundancy = TRUE
)
```

Arguments

covariateData	An object as generated using the getDbCovariateData function.
minFraction	Minimum fraction of the population that should have a non-zero value for a covariate for that covariate to be kept. Set to 0 to don't filter on frequency.
normalize	Normalize the covariates? (dividing by the max).
removeRedundancy	Should redundant covariates be removed?

Details

Normalize covariate values by dividing by the max and/or remove redundant covariates and/or remove infrequent covariates. For temporal covariates, redundancy is evaluated per time ID.

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