

Creating custom covariate builders (Korean)

Jeon Ga Bin & Martijn J. Schuemie

2025-10-28

1

condition_occurrence 1 .
, .
:
, R cohort_attribute . creating covariates using cohort attributes

2

1. covariateSettings .
2. .

3

1. covariateSettings .
2. fun .

3.1

```
createLooCovariateSettings <- function(useLengthOfObs = TRUE) {  
  covariateSettings <- list(useLengthOfObs = useLengthOfObs)  
  attr(covariateSettings, "fun") <- "getDbLooCovariateData"  
  class(covariateSettings) <- "covariateSettings"  
  return(covariateSettings)  
}
```

useLengthOfObs . covariateSettings . getDbLooCovariateData

4

4.1

```

      :

      • connection : DatabaseConnector      connect
      • oracleTempSchema :
      • cdmDatabaseSchema : OMOP CDM      . SQL SQL      ( :
        cdm_instance.dbo)
      • cdmVersion : OMOP CDM : "4" "5"
      • cohortTable :      .      ( : '#cohort_table')      ( :
        'cdm_schema.dbo.cohort)
      • cohortIds : ID. -1
      • cdmVersion :
      • rowIdField : row_id . 1 1
      • covariateSettings :
      • aggregated : 1 , ?

      cohort
      cohort_definition_id). 1 ( , cohort_start_date)      (subject_id,cohort_start_date, and
      . rowIdField      subject_id-cohort_start_date

```

4.2

```

      covariateData

      • covariates : ID      ffd      0      (rowId,covariateId, and covariateValue)
      • covariateRef : ffd      (covariateId, covariateName, analysisId, conceptId)
      • analysisRef : ffd      (analysisId,analysisName,domainIdsta,startDay,endDay,isBinary,missingMe
      • metaData : covariateData

```

4.3

```

getDbLooCovariateData <- function(connection,
                                oracleTempSchema = NULL,
                                cdmDatabaseSchema,
                                cohortTable = "#cohort_person",
                                cohortIds = c(-1),
                                cdmVersion = "5",
                                rowIdField = "subject_id",
                                covariateSettings,
                                aggregated = FALSE) {
  writeLines("Constructing length of observation covariates")
  if (covariateSettings$useLengthOfObs == FALSE) {
    return(NULL)
  }
  if (aggregated) {
    stop("Aggregation not supported")
  }
}

```

```

# Some SQL to construct the covariate:
sql <- paste(
  "SELECT @row_id_field AS row_id, 1 AS covariate_id,",
  "DATEDIFF(DAY, observation_period_start_date, cohort_start_date)",
  "AS covariate_value",
  "FROM @cohort_table c",
  "INNER JOIN @cdm_database_schema.observation_period op",
  "ON op.person_id = c.subject_id",
  "WHERE cohort_start_date >= observation_period_start_date",
  "AND cohort_start_date <= observation_period_end_date",
  "{@cohort_ids != -1} ? {AND cohort_definition_id IN @cohort_ids}"
)
sql <- SqlRender::render(sql,
  cohort_table = cohortTable,
  cohort_ids = cohortIds,
  row_id_field = rowIdField,
  cdm_database_schema = cdmDatabaseSchema
)
sql <- SqlRender::translate(sql, targetDialect = attr(connection, "dbms"))

# Retrieve the covariate:
covariates <- DatabaseConnector::querySql.ffdf(connection, sql)

# Convert column names to camelCase:
colnames(covariates) <- SqlRender::snakeCaseToCamelCase(colnames(covariates))

# Construct covariate reference:
covariateRef <- data.frame(
  covariateId = 1,
  covariateName = "Length of observation",
  analysisId = 1,
  conceptId = 0
)
covariateRef <- ff::as.ffdf(covariateRef)

# Construct analysis reference:
analysisRef <- data.frame(
  analysisId = 1,
  analysisName = "Length of observation",
  domainId = "Demographics",
  startDay = 0,
  endDay = 0,
  isBinary = "N",
  missingMeansZero = "Y"
)
analysisRef <- ff::as.ffdf(analysisRef)

# Construct analysis reference:
metaData <- list(sql = sql, call = match.call())
result <- list(
  covariates = covariates,
  covariateRef = covariateRef,
  analysisRef = analysisRef,

```

```

      metaData = metaData
    )
    class(result) <- "covariateData"
    return(result)
  }
}

```

observation_period_start_date	,	,	.	SQL	SqlRender
SQL	.	DatabaseConnector	ffdf	.	,
covariate, covariateRef	analysisRef	.			

5

PatientLevelPrediction cohortMethod FeatureExtraction .
, .
:

```
looCovSet <- createLooCovariateSettings(useLengthOfObs = TRUE)

covariates <- getDbCovariateData(
  connectionDetails = connectionDetails,
  cdmDatabaseSchema = cdmDatabaseSchema,
  cohortDatabaseSchema = resultsDatabaseSchema,
  cohortTable = "rehospitalization",
  cohortIds = c(1),
  covariateSettings = looCovSet
)
```

```

covariateSettings <- createCovariateSettings(
  useDemographicsGender = TRUE,
  useDemographicsAgeGroup = TRUE,
  useDemographicsRace = TRUE,
  useDemographicsEthnicity = TRUE,
  useDemographicsIndexYear = TRUE,
  useDemographicsIndexMonth = TRUE
)

looCovSet <- createLooCovariateSettings(useLengthOfObs = TRUE)

covariateSettingsList <- list(covariateSettings, looCovSet)

covariates <- getDbCovariateData(
  connectionDetails = connectionDetails,
  cdmDatabaseSchema = cdmDatabaseSchema,
  cohortDatabaseSchema = resultsDatabaseSchema,
  cohortTable = "rehospitalization",
  cohortIds = c(1),
  covariateSettings = covariateSettingsList
)

```