

Using ARQ to make SPARQL queries

mja@statgroup.dk

2016-02-15

Contents

SPARQL scripts for the demographics cube (DC-DEMO-sample.ttl)	1
Get dimensions	1
Get attributes	2
Get observations	2
Get definition for all descriptive statistics - class <code>code:procedure</code>	5
Get the codelists	5
Get the codelist definition for all descriptive statistics - class <code>code:procedure</code>	11
Get definition for all variables used for descriptive statistics - class <code>code:factor</code>	13
Get the codelist definition for all variables used for descriptive statistics - class <code>code:factor</code>	13
Get definition for descriptive statistics median	15
Get information for selection of data	15
Get information on the underlying data in D2RQ format	15
Get underlying data for one cube observation	18
 How to run this .Rmd file	 67

SPARQL scripts for the demographics cube (DC-DEMO-sample.ttl)

The examples below uses `arq` from Apache Jena (<http://jena.apache.org>). To install `arq` - download and unpack the latest version of `apache-jena` from (<http://jena.apache.org/download/index.cgi>). Then you need some way of invoking `arq`; I use a not-so-clever-approach: `cd ~/bin; ln -s /opt/apache-jena-2.13.0/bin/arq`.

Given a SPARQL query and RDF data, `arq` returns the result of the query. So this is the command line way of making a SPARQL query.

The use of `arq` is described many places, see for example (<http://www.learningsparql.com/>).

All `arq` commands below are to be run in the directory with the sample files, which is `inst/extdata/sample-rdf` directory or `extdata/sample-rdf` depending on the whether the development version or the installed version of the package is used.

The `cd` below in each code block is included because I could not find a quick way to get the code chunk executed in that directory. `knitr` is flexible enough to do it, I have not yet found the right way to do it. So, ignore the repeated `cd ..`

Get dimensions

```
cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOdimensions.rq
```

```
## -----
## | p |
## =====
## | crnd-dimension:ethnic |
## | crnd-dimension:race |
## | crnd-dimension:procedure |
## | crnd-dimension:agegr1 |
## | crnd-dimension:factor |
## | crnd-dimension:trt01a |
## | crnd-dimension:sex |
## -----
```

Get attributes

```
cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOattributes.rq
```

```
## -----
## | p |
## =====
## | crnd-attribute:cellpartno |
## | crnd-attribute:measurefmt |
## | crnd-attribute:colno |
## | crnd-attribute:denominator |
## | crnd-attribute:unit |
## | crnd-attribute:rowno |
## -----
```

Get observations

The SPARQL script shows for each observation the dimension, attributes and measures in a row. Note: in the HTML version the output below can be scrolled using the left and right arrow.

```
cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOobservations.rq
```

```
## -----
## | s | ethnic | race | procedure |
## =====
## | ds:obs103 | code:ethnic-_ALL_ | code:race-_ALL_ | code:procedure-_ALL_ |
## | ds:obs014 | code:ethnic-_ALL_ | code:race-_ALL_ | code:procedure-_ALL_ |
## | ds:obs089 | code:ethnic-_ALL_ | code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE | code:procedure-_ALL_ |
## | ds:obs019 | code:ethnic-_ALL_ | code:race-_ALL_ | code:procedure-_ALL_ |
## | ds:obs031 | code:ethnic-_ALL_ | code:race-_ALL_ | code:procedure-_ALL_ |
## | ds:obs013 | code:ethnic-_ALL_ | code:race-_ALL_ | code:procedure-_ALL_ |
```

##	ds:obs124	code:ethnic-NOT_HISPANIC_OR_LATINO	code:race-_ALL_	code
##	ds:obs084	code:ethnic-_ALL_	code:race-BLACK_OR_AFRICAN_AMERICAN	code
##	ds:obs129	code:ethnic-HISPANIC_OR_LATINO	code:race-_ALL_	code
##	ds:obs088	code:ethnic-_ALL_	code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE	code
##	ds:obs041	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs123	code:ethnic-NOT_HISPANIC_OR_LATINO	code:race-_ALL_	code
##	ds:obs094	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs098	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs048	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs093	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs097	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs021	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs058	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs132	code:ethnic-HISPANIC_OR_LATINO	code:race-_ALL_	code
##	ds:obs027	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs020	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs056	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs130	code:ethnic-HISPANIC_OR_LATINO	code:race-_ALL_	code
##	ds:obs051	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs007	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs055	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs076	code:ethnic-_ALL_	code:race-WHITE	code
##	ds:obs117	code:ethnic-_NONMISS_	code:race-_ALL_	code
##	ds:obs072	code:ethnic-_ALL_	code:race-_NONMISS_	code
##	ds:obs001	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs026	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs006	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs106	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs061	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs065	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs111	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs071	code:ethnic-_ALL_	code:race-_NONMISS_	code
##	ds:obs116	code:ethnic-_NONMISS_	code:race-_ALL_	code
##	ds:obs075	code:ethnic-_ALL_	code:race-WHITE	code
##	ds:obs100	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs105	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs060	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs016	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs064	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs036	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs110	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs126	code:ethnic-NOT_HISPANIC_OR_LATINO	code:race-_ALL_	code
##	ds:obs081	code:ethnic-_ALL_	code:race-BLACK_OR_AFRICAN_AMERICAN	code
##	ds:obs010	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs085	code:ethnic-_ALL_	code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE	code
##	ds:obs035	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs120	code:ethnic-_NONMISS_	code:race-_ALL_	code
##	ds:obs080	code:ethnic-_ALL_	code:race-BLACK_OR_AFRICAN_AMERICAN	code
##	ds:obs033	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs090	code:ethnic-_ALL_	code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE	code
##	ds:obs015	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs043	code:ethnic-_ALL_	code:race-_ALL_	code
##	ds:obs125	code:ethnic-NOT_HISPANIC_OR_LATINO	code:race-_ALL_	code
##	ds:obs042	code:ethnic-_ALL_	code:race-_ALL_	code

##		ds:obs095		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs099		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs052		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs029		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs023		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs059		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs028		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs022		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs009		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs057		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs038		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs003		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs119		code:ethnic-_NONMISS_		code:race-_ALL_		code
##		ds:obs078		code:ethnic-_ALL_		code:race-WHITE		code
##		ds:obs008		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs108		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs118		code:ethnic-_NONMISS_		code:race-_ALL_		code
##		ds:obs067		code:ethnic-_ALL_		code:race-_NONMISS_		code
##		ds:obs018		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs113		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs073		code:ethnic-_ALL_		code:race-WHITE		code
##		ds:obs002		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs102		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs077		code:ethnic-_ALL_		code:race-WHITE		code
##		ds:obs107		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs062		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs030		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs066		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs112		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs128		code:ethnic-HISPANIC_OR_LATINO		code:race-_ALL_		code
##		ds:obs083		code:ethnic-_ALL_		code:race-BLACK_OR_AFRICAN_AMERICAN		code
##		ds:obs101		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs012		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs017		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs087		code:ethnic-_ALL_		code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE		code
##		ds:obs037		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs122		code:ethnic-NOT_HISPANIC_OR_LATINO		code:race-_ALL_		code
##		ds:obs127		code:ethnic-HISPANIC_OR_LATINO		code:race-_ALL_		code
##		ds:obs011		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs082		code:ethnic-_ALL_		code:race-BLACK_OR_AFRICAN_AMERICAN		code
##		ds:obs086		code:ethnic-_ALL_		code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE		code
##		ds:obs047		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs121		code:ethnic-NOT_HISPANIC_OR_LATINO		code:race-_ALL_		code
##		ds:obs092		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs096		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs046		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs045		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs131		code:ethnic-HISPANIC_OR_LATINO		code:race-_ALL_		code
##		ds:obs091		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs040		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs044		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs050		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs054		code:ethnic-_ALL_		code:race-_ALL_		code
##		ds:obs005		code:ethnic-_ALL_		code:race-_ALL_		code

```
## | ds:obs053 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs025 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs115 | code:ethnic-_NONMISS_ | code:race-_ALL_ | code
## | ds:obs070 | code:ethnic-_ALL_ | code:race-_NONMISS_ | code
## | ds:obs074 | code:ethnic-_ALL_ | code:race-WHITE | code
## | ds:obs104 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs024 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs063 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs034 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs039 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs069 | code:ethnic-_ALL_ | code:race-_NONMISS_ | code
## | ds:obs004 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs079 | code:ethnic-_ALL_ | code:race-BLACK_OR_AFRICAN_AMERICAN | code
## | ds:obs109 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs068 | code:ethnic-_ALL_ | code:race-_NONMISS_ | code
## | ds:obs032 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs049 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## | ds:obs114 | code:ethnic-_ALL_ | code:race-_ALL_ | code
## -----
```

Get definition for all descriptive statistics - class code:procedure

The SPARQL script shows how the R function definition for the descriptive statistics is stored in the cube.

```
cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOprocedure.rq
```

```
## -----
## | procedure | prefLabel | functiondef
## =====
## | code:procedure-max | "max" | "function (x) { max(x, na.rm = TRUE) }"
## | code:procedure-std | "std" | "function (x) { sd(x, na.rm = TRUE) }"
## | code:procedure-mean | "mean" | "function (x) { mean(x, na.rm = TRUE) }"
## | code:procedure-min | "min" | "function (x) { min(x, na.rm = TRUE) }"
## | code:procedure-percent | "percent" | "function (x) { -1 }"
## | code:procedure-count | "count" | "function (x) { length(x) }"
## | code:procedure-q3 | "q3" | "function (x) { quantile(x, probs = c(0.75), na.rm = TRUE) }"
## | code:procedure-n | "n" | "function (x) { length(x[!is.na(x)]) }"
## | code:procedure-median | "median" | "function (x) { median(x, na.rm = TRUE) }"
## | code:procedure-q1 | "q1" | "function (x) { quantile(x, probs = c(0.25), na.rm = TRUE) }"
## -----
```

Get the codelists

The SPARQL script shows the codelist.

```
cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOcodelist.rq
```

```
## -----
## | codeList | codelevel | codelist | prefLabel
```

```

## =====
## | code:ethnic | code:factor-quantity | code:factor | "quantity"
## | code:ethnic | code:procedure-max | code:procedure | "max"
## | code:ethnic | code:procedure-q3 | code:procedure | "q3"
## | code:ethnic | code:sex-F | code:sex | "F"
## | code:ethnic | code:agegr1-_65 | code:agegr1 | "<65"
## | code:ethnic | code:factor-proportion | code:factor | "proportion"
## | code:ethnic | code:agegr1-_80 | code:agegr1 | ">80"
## | code:ethnic | code:race-_ALL_ | code:race | "_ALL_"
## | code:ethnic | code:procedure-mean | code:procedure | "mean"
## | code:ethnic | code:trt01a-_ALL_ | code:trt01a | "_ALL_"
## | code:ethnic | code:sex-M | code:sex | "M"
## | code:ethnic | code:ethnic-HISPANIC_OR_LATINO | code:ethnic | "HISPANIC OR LATINO"
## | code:ethnic | code:race-NATIVE_HAWAIIAN_OR_OTHER_PACIFIC_ISLANDER | code:race | "NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER"
## | code:ethnic | code:ethnic-NOT_HISPANIC_OR_LATINO | code:ethnic | "NOT HISPANIC OR LATINO"
## | code:ethnic | code:procedure-median | code:procedure | "median"
## | code:ethnic | code:ethnic-_NONMISS_ | code:ethnic | "_NONMISS_"
## | code:ethnic | code:procedure-q1 | code:procedure | "q1"
## | code:ethnic | code:trt01a-Xanomeline_High_Dose | code:trt01a | "Xanomeline_High_Dose"
## | code:ethnic | code:agegr1-_ALL_ | code:agegr1 | "_ALL_"
## | code:ethnic | code:sex-UN | code:sex | "UN"
## | code:ethnic | code:sex-_ALL_ | code:sex | "_ALL_"
## | code:ethnic | code:race-ASIAN | code:race | "ASIAN"
## | code:ethnic | code:race-WHITE | code:race | "WHITE"
## | code:ethnic | code:trt01a-_NONMISS_ | code:trt01a | "_NONMISS_"
## | code:ethnic | code:sex-_NONMISS_ | code:sex | "_NONMISS_"
## | code:ethnic | code:factor-age | code:factor | "age"
## | code:ethnic | code:ethnic-_ALL_ | code:ethnic | "_ALL_"
## | code:ethnic | code:procedure-n | code:procedure | "n"
## | code:ethnic | code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE | code:race | "AMERICAN INDIAN OR ALASKA NATIVE"
## | code:ethnic | code:trt01a-Placebo | code:trt01a | "Placebo"
## | code:ethnic | code:factor-weightbl | code:factor | "weightbl"
## | code:ethnic | code:trt01a-Xanomeline_Low_Dose | code:trt01a | "Xanomeline_Low_Dose"
## | code:ethnic | code:factor-_ALL_ | code:factor | "_ALL_"
## | code:ethnic | code:procedure-percent | code:procedure | "percent"
## | code:ethnic | code:agegr1-65-80 | code:agegr1 | "65-80"
## | code:ethnic | code:procedure-min | code:procedure | "min"
## | code:ethnic | code:race-_NONMISS_ | code:race | "_NONMISS_"
## | code:ethnic | code:agegr1-_NONMISS_ | code:agegr1 | "_NONMISS_"
## | code:ethnic | code:race-BLACK_OR_AFRICAN_AMERICAN | code:race | "BLACK OR AFRICAN AMERICAN"
## | code:ethnic | code:factor-_NONMISS_ | code:factor | "_NONMISS_"
## | code:ethnic | code:sex-U | code:sex | "U"
## | code:ethnic | code:procedure-count | code:procedure | "count"
## | code:ethnic | code:procedure-std | code:procedure | "std"
## | code:agegr1 | code:factor-quantity | code:factor | "quantity"
## | code:agegr1 | code:procedure-max | code:procedure | "max"
## | code:agegr1 | code:procedure-q3 | code:procedure | "q3"
## | code:agegr1 | code:sex-F | code:sex | "F"
## | code:agegr1 | code:agegr1-_65 | code:agegr1 | "<65"
## | code:agegr1 | code:factor-proportion | code:factor | "proportion"
## | code:agegr1 | code:agegr1-_80 | code:agegr1 | ">80"
## | code:agegr1 | code:race-_ALL_ | code:race | "_ALL_"
## | code:agegr1 | code:procedure-mean | code:procedure | "mean"
## | code:agegr1 | code:trt01a-_ALL_ | code:trt01a | "_ALL_"

```

##		code:agegr1		code:sex-M		code:sex		"M"
##		code:agegr1		code:ethnic-HISPANIC_OR_LATINO		code:ethnic		"HISPANIC O
##		code:agegr1		code:race-NATIVE_HAWAIIAN_OR_OTHER_PACIFIC_ISLANDER		code:race		"NATIVE HAW
##		code:agegr1		code:ethnic-NOT_HISPANIC_OR_LATINO		code:ethnic		"NOT HISPAN
##		code:agegr1		code:procedure-median		code:procedure		"median"
##		code:agegr1		code:ethnic-_NONMISS_		code:ethnic		"_NONMISS
##		code:agegr1		code:procedure-q1		code:procedure		"q1"
##		code:agegr1		code:trt01a-Xanomeline_High_Dose		code:trt01a		"Xanomeline
##		code:agegr1		code:agegr1-_ALL_		code:agegr1		"_ALL_"
##		code:agegr1		code:sex-UN		code:sex		"UN"
##		code:agegr1		code:sex-_ALL_		code:sex		"_ALL_"
##		code:agegr1		code:race-ASIAN		code:race		"ASIAN"
##		code:agegr1		code:race-WHITE		code:race		"WHITE"
##		code:agegr1		code:trt01a-_NONMISS_		code:trt01a		"_NONMISS_
##		code:agegr1		code:sex-_NONMISS_		code:sex		"_NONMISS_
##		code:agegr1		code:factor-age		code:factor		"age"
##		code:agegr1		code:ethnic-_ALL_		code:ethnic		"_ALL_"
##		code:agegr1		code:procedure-n		code:procedure		"n"
##		code:agegr1		code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE		code:race		"AMERICAN I
##		code:agegr1		code:trt01a-Placebo		code:trt01a		"Placebo"
##		code:agegr1		code:factor-weightbl		code:factor		"weightbl"
##		code:agegr1		code:trt01a-Xanomeline_Low_Dose		code:trt01a		"Xanomeline
##		code:agegr1		code:factor-_ALL_		code:factor		"_ALL_"
##		code:agegr1		code:procedure-percent		code:procedure		"percent"
##		code:agegr1		code:agegr1-65-80		code:agegr1		"65-80"
##		code:agegr1		code:procedure-min		code:procedure		"min"
##		code:agegr1		code:race-_NONMISS_		code:race		"_NONMISS_
##		code:agegr1		code:agegr1-_NONMISS_		code:agegr1		"_NONMISS_
##		code:agegr1		code:race-BLACK_OR_AFRICAN_AMERICAN		code:race		"BLACK OR A
##		code:agegr1		code:factor-_NONMISS_		code:factor		"_NONMISS_
##		code:agegr1		code:sex-U		code:sex		"U"
##		code:agegr1		code:procedure-count		code:procedure		"count"
##		code:agegr1		code:procedure-std		code:procedure		"std"
##		code:procedure		code:factor-quantity		code:factor		"quantity"
##		code:procedure		code:procedure-max		code:procedure		"max"
##		code:procedure		code:procedure-q3		code:procedure		"q3"
##		code:procedure		code:sex-F		code:sex		"F"
##		code:procedure		code:agegr1-_65		code:agegr1		"<65"
##		code:procedure		code:factor-proportion		code:factor		"proportion
##		code:procedure		code:agegr1-_80		code:agegr1		">80"
##		code:procedure		code:race-_ALL_		code:race		"_ALL_"
##		code:procedure		code:procedure-mean		code:procedure		"mean"
##		code:procedure		code:trt01a-_ALL_		code:trt01a		"_ALL_"
##		code:procedure		code:sex-M		code:sex		"M"
##		code:procedure		code:ethnic-HISPANIC_OR_LATINO		code:ethnic		"HISPANIC O
##		code:procedure		code:race-NATIVE_HAWAIIAN_OR_OTHER_PACIFIC_ISLANDER		code:race		"NATIVE HAW
##		code:procedure		code:ethnic-NOT_HISPANIC_OR_LATINO		code:ethnic		"NOT HISPAN
##		code:procedure		code:procedure-median		code:procedure		"median"
##		code:procedure		code:ethnic-_NONMISS_		code:ethnic		"_NONMISS_
##		code:procedure		code:procedure-q1		code:procedure		"q1"
##		code:procedure		code:trt01a-Xanomeline_High_Dose		code:trt01a		"Xanomeline
##		code:procedure		code:agegr1-_ALL_		code:agegr1		"_ALL_"
##		code:procedure		code:sex-UN		code:sex		"UN"
##		code:procedure		code:sex-_ALL_		code:sex		"_ALL_"

##		code:procedure		code:race-ASIAN		code:race		"ASIAN"
##		code:procedure		code:race-WHITE		code:race		"WHITE"
##		code:procedure		code:trt01a-_NONMISS_		code:trt01a		"_NONMISS_"
##		code:procedure		code:sex-_NONMISS_		code:sex		"_NONMISS_"
##		code:procedure		code:factor-age		code:factor		"age"
##		code:procedure		code:ethnic-_ALL_		code:ethnic		"_ALL_"
##		code:procedure		code:procedure-n		code:procedure		"n"
##		code:procedure		code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE		code:race		"AMERICAN_INDIAN_OR_ALASKA_NATIVE"
##		code:procedure		code:trt01a-Placebo		code:trt01a		"Placebo"
##		code:procedure		code:factor-weightbl		code:factor		"weightbl"
##		code:procedure		code:trt01a-Xanomeline_Low_Dose		code:trt01a		"Xanomeline_Low_Dose"
##		code:procedure		code:factor-_ALL_		code:factor		"_ALL_"
##		code:procedure		code:procedure-percent		code:procedure		"percent"
##		code:procedure		code:agegr1-65-80		code:agegr1		"65-80"
##		code:procedure		code:procedure-min		code:procedure		"min"
##		code:procedure		code:race-_NONMISS_		code:race		"_NONMISS_"
##		code:procedure		code:agegr1-_NONMISS_		code:agegr1		"_NONMISS_"
##		code:procedure		code:race-BLACK_OR_AFRICAN_AMERICAN		code:race		"BLACK_OR_AFRICAN_AMERICAN"
##		code:procedure		code:factor-_NONMISS_		code:factor		"_NONMISS_"
##		code:procedure		code:sex-U		code:sex		"U"
##		code:procedure		code:procedure-count		code:procedure		"count"
##		code:procedure		code:procedure-std		code:procedure		"std"
##		code:factor		code:factor-quantity		code:factor		"quantity"
##		code:factor		code:procedure-max		code:procedure		"max"
##		code:factor		code:procedure-q3		code:procedure		"q3"
##		code:factor		code:sex-F		code:sex		"F"
##		code:factor		code:agegr1-_65		code:agegr1		"<65"
##		code:factor		code:factor-proportion		code:factor		"proportion"
##		code:factor		code:agegr1-_80		code:agegr1		">80"
##		code:factor		code:race-_ALL_		code:race		"_ALL_"
##		code:factor		code:procedure-mean		code:procedure		"mean"
##		code:factor		code:trt01a-_ALL_		code:trt01a		"_ALL_"
##		code:factor		code:sex-M		code:sex		"M"
##		code:factor		code:ethnic-HISPANIC_OR_LATINO		code:ethnic		"HISPANIC_OR_LATINO"
##		code:factor		code:race-NATIVE_HAWAIIAN_OR_OTHER_PACIFIC_ISLANDER		code:race		"NATIVE_HAWAIIAN_OR_OTHER_PACIFIC_ISLANDER"
##		code:factor		code:ethnic-NOT_HISPANIC_OR_LATINO		code:ethnic		"NOT_HISPANIC_OR_LATINO"
##		code:factor		code:procedure-median		code:procedure		"median"
##		code:factor		code:ethnic-_NONMISS_		code:ethnic		"_NONMISS_"
##		code:factor		code:procedure-q1		code:procedure		"q1"
##		code:factor		code:trt01a-Xanomeline_High_Dose		code:trt01a		"Xanomeline_High_Dose"
##		code:factor		code:agegr1-_ALL_		code:agegr1		"_ALL_"
##		code:factor		code:sex-UN		code:sex		"UN"
##		code:factor		code:sex-_ALL_		code:sex		"_ALL_"
##		code:factor		code:race-ASIAN		code:race		"ASIAN"
##		code:factor		code:race-WHITE		code:race		"WHITE"
##		code:factor		code:trt01a-_NONMISS_		code:trt01a		"_NONMISS_"
##		code:factor		code:sex-_NONMISS_		code:sex		"_NONMISS_"
##		code:factor		code:factor-age		code:factor		"age"
##		code:factor		code:ethnic-_ALL_		code:ethnic		"_ALL_"
##		code:factor		code:procedure-n		code:procedure		"n"
##		code:factor		code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE		code:race		"AMERICAN_INDIAN_OR_ALASKA_NATIVE"
##		code:factor		code:trt01a-Placebo		code:trt01a		"Placebo"
##		code:factor		code:factor-weightbl		code:factor		"weightbl"
##		code:factor		code:trt01a-Xanomeline_Low_Dose		code:trt01a		"Xanomeline_Low_Dose"

##		code:factor		code:factor-_ALL_		code:factor		"_ALL_"
##		code:factor		code:procedure-percent		code:procedure		"percent"
##		code:factor		code:agegr1-65-80		code:agegr1		"65-80"
##		code:factor		code:procedure-min		code:procedure		"min"
##		code:factor		code:race-_NONMISS_		code:race		"_NONMISS_"
##		code:factor		code:agegr1-_NONMISS_		code:agegr1		"_NONMISS_"
##		code:factor		code:race-BLACK_OR_AFRICAN_AMERICAN		code:race		"BLACK OR AFRICAN AMERICAN"
##		code:factor		code:factor-_NONMISS_		code:factor		"_NONMISS_"
##		code:factor		code:sex-U		code:sex		"U"
##		code:factor		code:procedure-count		code:procedure		"count"
##		code:factor		code:procedure-std		code:procedure		"std"
##		code:trt01a		code:factor-quantity		code:factor		"quantity"
##		code:trt01a		code:procedure-max		code:procedure		"max"
##		code:trt01a		code:procedure-q3		code:procedure		"q3"
##		code:trt01a		code:sex-F		code:sex		"F"
##		code:trt01a		code:agegr1-_65		code:agegr1		"<65"
##		code:trt01a		code:factor-proportion		code:factor		"proportion"
##		code:trt01a		code:agegr1-_80		code:agegr1		">80"
##		code:trt01a		code:race-_ALL_		code:race		"_ALL_"
##		code:trt01a		code:procedure-mean		code:procedure		"mean"
##		code:trt01a		code:trt01a-_ALL_		code:trt01a		"_ALL_"
##		code:trt01a		code:sex-M		code:sex		"M"
##		code:trt01a		code:ethnic-HISPANIC_OR_LATINO		code:ethnic		"HISPANIC OR LATINO"
##		code:trt01a		code:race-NATIVE_HAWAIIAN_OR_OTHER_PACIFIC_ISLANDER		code:race		"NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER"
##		code:trt01a		code:ethnic-NOT_HISPANIC_OR_LATINO		code:ethnic		"NOT HISPANIC OR LATINO"
##		code:trt01a		code:procedure-median		code:procedure		"median"
##		code:trt01a		code:ethnic-_NONMISS_		code:ethnic		"_NONMISS_"
##		code:trt01a		code:procedure-q1		code:procedure		"q1"
##		code:trt01a		code:trt01a-Xanomeline_High_Dose		code:trt01a		"Xanomeline High Dose"
##		code:trt01a		code:agegr1-_ALL_		code:agegr1		"_ALL_"
##		code:trt01a		code:sex-UN		code:sex		"UN"
##		code:trt01a		code:sex-_ALL_		code:sex		"_ALL_"
##		code:trt01a		code:race-ASIAN		code:race		"ASIAN"
##		code:trt01a		code:race-WHITE		code:race		"WHITE"
##		code:trt01a		code:trt01a-_NONMISS_		code:trt01a		"_NONMISS_"
##		code:trt01a		code:sex-_NONMISS_		code:sex		"_NONMISS_"
##		code:trt01a		code:factor-age		code:factor		"age"
##		code:trt01a		code:ethnic-_ALL_		code:ethnic		"_ALL_"
##		code:trt01a		code:procedure-n		code:procedure		"n"
##		code:trt01a		code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE		code:race		"AMERICAN INDIAN OR ALASKA NATIVE"
##		code:trt01a		code:trt01a-Placebo		code:trt01a		"Placebo"
##		code:trt01a		code:factor-weightbl		code:factor		"weightbl"
##		code:trt01a		code:trt01a-Xanomeline_Low_Dose		code:trt01a		"Xanomeline Low Dose"
##		code:trt01a		code:factor-_ALL_		code:factor		"_ALL_"
##		code:trt01a		code:procedure-percent		code:procedure		"percent"
##		code:trt01a		code:agegr1-65-80		code:agegr1		"65-80"
##		code:trt01a		code:procedure-min		code:procedure		"min"
##		code:trt01a		code:race-_NONMISS_		code:race		"_NONMISS_"
##		code:trt01a		code:agegr1-_NONMISS_		code:agegr1		"_NONMISS_"
##		code:trt01a		code:race-BLACK_OR_AFRICAN_AMERICAN		code:race		"BLACK OR AFRICAN AMERICAN"
##		code:trt01a		code:factor-_NONMISS_		code:factor		"_NONMISS_"
##		code:trt01a		code:sex-U		code:sex		"U"
##		code:trt01a		code:procedure-count		code:procedure		"count"
##		code:trt01a		code:procedure-std		code:procedure		"std"

##		code:sex		code:factor-quantity		code:factor		"quantity"
##		code:sex		code:procedure-max		code:procedure		"max"
##		code:sex		code:procedure-q3		code:procedure		"q3"
##		code:sex		code:sex-F		code:sex		"F"
##		code:sex		code:agegr1-_65		code:agegr1		"<65"
##		code:sex		code:factor-proportion		code:factor		"proportion"
##		code:sex		code:agegr1-_80		code:agegr1		">80"
##		code:sex		code:race-_ALL_		code:race		"_ALL_"
##		code:sex		code:procedure-mean		code:procedure		"mean"
##		code:sex		code:trt01a-_ALL_		code:trt01a		"_ALL_"
##		code:sex		code:sex-M		code:sex		"M"
##		code:sex		code:ethnic-HISPANIC_OR_LATINO		code:ethnic		"HISPANIC OR LATINO"
##		code:sex		code:race-NATIVE_HAWAIIAN_OR_OTHER_PACIFIC_ISLANDER		code:race		"NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER"
##		code:sex		code:ethnic-NOT_HISPANIC_OR_LATINO		code:ethnic		"NOT HISPANIC OR LATINO"
##		code:sex		code:procedure-median		code:procedure		"median"
##		code:sex		code:ethnic-_NONMISS_		code:ethnic		"_NONMISS_"
##		code:sex		code:procedure-q1		code:procedure		"q1"
##		code:sex		code:trt01a-Xanomeline_High_Dose		code:trt01a		"Xanomeline_High_Dose"
##		code:sex		code:agegr1-_ALL_		code:agegr1		"_ALL_"
##		code:sex		code:sex-UN		code:sex		"UN"
##		code:sex		code:sex-_ALL_		code:sex		"_ALL_"
##		code:sex		code:race-ASIAN		code:race		"ASIAN"
##		code:sex		code:race-WHITE		code:race		"WHITE"
##		code:sex		code:trt01a-_NONMISS_		code:trt01a		"_NONMISS_"
##		code:sex		code:sex-_NONMISS_		code:sex		"_NONMISS_"
##		code:sex		code:factor-age		code:factor		"age"
##		code:sex		code:ethnic-_ALL_		code:ethnic		"_ALL_"
##		code:sex		code:procedure-n		code:procedure		"n"
##		code:sex		code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE		code:race		"AMERICAN INDIAN OR ALASKA NATIVE"
##		code:sex		code:trt01a-Placebo		code:trt01a		"Placebo"
##		code:sex		code:factor-weighttbl		code:factor		"weighttbl"
##		code:sex		code:trt01a-Xanomeline_Low_Dose		code:trt01a		"Xanomeline_Low_Dose"
##		code:sex		code:factor-_ALL_		code:factor		"_ALL_"
##		code:sex		code:procedure-percent		code:procedure		"percent"
##		code:sex		code:agegr1-65-80		code:agegr1		"65-80"
##		code:sex		code:procedure-min		code:procedure		"min"
##		code:sex		code:race-_NONMISS_		code:race		"_NONMISS_"
##		code:sex		code:agegr1-_NONMISS_		code:agegr1		"_NONMISS_"
##		code:sex		code:race-BLACK_OR_AFRICAN_AMERICAN		code:race		"BLACK OR AFRICAN AMERICAN"
##		code:sex		code:factor-_NONMISS_		code:factor		"_NONMISS_"
##		code:sex		code:sex-U		code:sex		"U"
##		code:sex		code:procedure-count		code:procedure		"count"
##		code:sex		code:procedure-std		code:procedure		"std"
##		code:race		code:factor-quantity		code:factor		"quantity"
##		code:race		code:procedure-max		code:procedure		"max"
##		code:race		code:procedure-q3		code:procedure		"q3"
##		code:race		code:sex-F		code:sex		"F"
##		code:race		code:agegr1-_65		code:agegr1		"<65"
##		code:race		code:factor-proportion		code:factor		"proportion"
##		code:race		code:agegr1-_80		code:agegr1		">80"
##		code:race		code:race-_ALL_		code:race		"_ALL_"
##		code:race		code:procedure-mean		code:procedure		"mean"
##		code:race		code:trt01a-_ALL_		code:trt01a		"_ALL_"
##		code:race		code:sex-M		code:sex		"M"

##	code:race	code:ethnic-HISPANIC_OR_LATINO	code:ethnic	"HISPANIC OR LATINO"
##	code:race	code:race-NATIVE_HAWAIIAN_OR_OTHER_PACIFIC_ISLANDER	code:race	"NATIVE_HAWAIIAN_OR_OTHER_PACIFIC_ISLANDER"
##	code:race	code:ethnic-NOT_HISPANIC_OR_LATINO	code:ethnic	"NOT_HISPANIC_OR_LATINO"
##	code:race	code:procedure-median	code:procedure	"median"
##	code:race	code:ethnic-_NONMISS_	code:ethnic	"_NONMISS_"
##	code:race	code:procedure-q1	code:procedure	"q1"
##	code:race	code:trt01a-Xanomeline_High_Dose	code:trt01a	"Xanomeline_High_Dose"
##	code:race	code:agegr1-_ALL_	code:agegr1	"_ALL_"
##	code:race	code:sex-UN	code:sex	"UN"
##	code:race	code:sex-_ALL_	code:sex	"_ALL_"
##	code:race	code:race-ASIAN	code:race	"ASIAN"
##	code:race	code:race-WHITE	code:race	"WHITE"
##	code:race	code:trt01a-_NONMISS_	code:trt01a	"_NONMISS_"
##	code:race	code:sex-_NONMISS_	code:sex	"_NONMISS_"
##	code:race	code:factor-age	code:factor	"age"
##	code:race	code:ethnic-_ALL_	code:ethnic	"_ALL_"
##	code:race	code:procedure-n	code:procedure	"n"
##	code:race	code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE	code:race	"AMERICAN_INDIAN_OR_ALASKA_NATIVE"
##	code:race	code:trt01a-Placebo	code:trt01a	"Placebo"
##	code:race	code:factor-weightbl	code:factor	"weightbl"
##	code:race	code:trt01a-Xanomeline_Low_Dose	code:trt01a	"Xanomeline_Low_Dose"
##	code:race	code:factor-_ALL_	code:factor	"_ALL_"
##	code:race	code:procedure-percent	code:procedure	"percent"
##	code:race	code:agegr1-65-80	code:agegr1	"65-80"
##	code:race	code:procedure-min	code:procedure	"min"
##	code:race	code:race-_NONMISS_	code:race	"_NONMISS_"
##	code:race	code:agegr1-_NONMISS_	code:agegr1	"_NONMISS_"
##	code:race	code:race-BLACK_OR_AFRICAN_AMERICAN	code:race	"BLACK_OR_AFRICAN_AMERICAN"
##	code:race	code:factor-_NONMISS_	code:factor	"_NONMISS_"
##	code:race	code:sex-U	code:sex	"U"
##	code:race	code:procedure-count	code:procedure	"count"
##	code:race	code:procedure-std	code:procedure	"std"
##	-----			

Get the codelist definition for all descriptive statistics - class code:procedure

The SPARQL script shows how the R function definition for the descriptive statistics is stored in the cube.

```
cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOprocedure-codelist.rq
```

##	s	p	o
##	=====		
##	code:procedure-min	skos:topConceptOf	code:procedure
##	code:procedure-min	skos:prefLabel	"min"
##	code:procedure-min	skos:inScheme	code:procedure
##	code:procedure-min	rrdfqbcrnd0:RdescStatDefFun	"function (x) { min(x, na.rm = TRUE)"
##	code:procedure-min	rrdfqbcrnd0:R-selectionvalue	"min"
##	code:procedure-min	rrdfqbcrnd0:R-selectionoperator	"=="
##	code:procedure-min	rdfs:comment	"Descriptive statistics min"@en
##	code:procedure-min	rdf:type	skos:Concept
##	code:procedure-min	rdf:type	code:Procedure

##		code:procedure-std		skos:topConceptOf		code:procedure
##		code:procedure-std		skos:prefLabel		"std"
##		code:procedure-std		skos:inScheme		code:procedure
##		code:procedure-std		rrdfqbcrnd0:RdescStatDefFun		"function (x) { sd(x, na.rm = TRUE
##		code:procedure-std		rrdfqbcrnd0:R-selectionvalue		"std"
##		code:procedure-std		rrdfqbcrnd0:R-selectionoperator		"=="
##		code:procedure-std		rdfs:comment		"Descriptive statistics std"@en
##		code:procedure-std		rdf:type		skos:Concept
##		code:procedure-std		rdf:type		code:Procedure
##		code:procedure-q3		skos:topConceptOf		code:procedure
##		code:procedure-q3		skos:prefLabel		"q3"
##		code:procedure-q3		skos:inScheme		code:procedure
##		code:procedure-q3		rrdfqbcrnd0:RdescStatDefFun		"function (x) { quantile(x, probs :
##		code:procedure-q3		rrdfqbcrnd0:R-selectionvalue		"q3"
##		code:procedure-q3		rrdfqbcrnd0:R-selectionoperator		"=="
##		code:procedure-q3		rdfs:comment		"Descriptive statistics q3"@en
##		code:procedure-q3		rdf:type		skos:Concept
##		code:procedure-q3		rdf:type		code:Procedure
##		code:procedure-median		skos:topConceptOf		code:procedure
##		code:procedure-median		skos:prefLabel		"median"
##		code:procedure-median		skos:inScheme		code:procedure
##		code:procedure-median		rrdfqbcrnd0:RdescStatDefFun		"function (x) { median(x, na.rm = "
##		code:procedure-median		rrdfqbcrnd0:R-selectionvalue		"median"
##		code:procedure-median		rrdfqbcrnd0:R-selectionoperator		"=="
##		code:procedure-median		rdfs:comment		"Descriptive statistics median"@en
##		code:procedure-median		rdf:type		skos:Concept
##		code:procedure-median		rdf:type		code:Procedure
##		code:procedure-count		skos:topConceptOf		code:procedure
##		code:procedure-count		skos:prefLabel		"count"
##		code:procedure-count		skos:inScheme		code:procedure
##		code:procedure-count		rrdfqbcrnd0:RdescStatDefFun		"function (x) { length(x) }"
##		code:procedure-count		rrdfqbcrnd0:R-selectionvalue		"count"
##		code:procedure-count		rrdfqbcrnd0:R-selectionoperator		"=="
##		code:procedure-count		rdfs:comment		"Descriptive statistics count"@en
##		code:procedure-count		rdf:type		skos:Concept
##		code:procedure-count		rdf:type		code:Procedure
##		code:procedure-max		skos:topConceptOf		code:procedure
##		code:procedure-max		skos:prefLabel		"max"
##		code:procedure-max		skos:inScheme		code:procedure
##		code:procedure-max		rrdfqbcrnd0:RdescStatDefFun		"function (x) { max(x, na.rm = TRUE
##		code:procedure-max		rrdfqbcrnd0:R-selectionvalue		"max"
##		code:procedure-max		rrdfqbcrnd0:R-selectionoperator		"=="
##		code:procedure-max		rdfs:comment		"Descriptive statistics max"@en
##		code:procedure-max		rdf:type		skos:Concept
##		code:procedure-max		rdf:type		code:Procedure
##		code:procedure-mean		skos:topConceptOf		code:procedure
##		code:procedure-mean		skos:prefLabel		"mean"
##		code:procedure-mean		skos:inScheme		code:procedure
##		code:procedure-mean		rrdfqbcrnd0:RdescStatDefFun		"function (x) { mean(x, na.rm = TRUE
##		code:procedure-mean		rrdfqbcrnd0:R-selectionvalue		"mean"
##		code:procedure-mean		rrdfqbcrnd0:R-selectionoperator		"=="
##		code:procedure-mean		rdfs:comment		"Descriptive statistics mean"@en
##		code:procedure-mean		rdf:type		skos:Concept
##		code:procedure-mean		rdf:type		code:Procedure

```

## | code:procedure-q1 | skos:topConceptOf | code:procedure
## | code:procedure-q1 | skos:prefLabel | "q1"
## | code:procedure-q1 | skos:inScheme | code:procedure
## | code:procedure-q1 | rrdfqbc rnd0:RdescStatDefFun | "function (x) { quantile(x, probs :
## | code:procedure-q1 | rrdfqbc rnd0:R-selectionvalue | "q1"
## | code:procedure-q1 | rrdfqbc rnd0:R-selectionoperator | "=="
## | code:procedure-q1 | rdfs:comment | "Descriptive statistics q1"@en
## | code:procedure-q1 | rdf:type | skos:Concept
## | code:procedure-q1 | rdf:type | code:Procedure
## | code:procedure-n | skos:topConceptOf | code:procedure
## | code:procedure-n | skos:prefLabel | "n"
## | code:procedure-n | skos:inScheme | code:procedure
## | code:procedure-n | rrdfqbc rnd0:RdescStatDefFun | "function (x) { length(x[!is.na(x)
## | code:procedure-n | rrdfqbc rnd0:R-selectionvalue | "n"
## | code:procedure-n | rrdfqbc rnd0:R-selectionoperator | "=="
## | code:procedure-n | rdfs:comment | "Descriptive statistics n"@en
## | code:procedure-n | rdf:type | skos:Concept
## | code:procedure-n | rdf:type | code:Procedure
## | code:procedure-percent | skos:topConceptOf | code:procedure
## | code:procedure-percent | skos:prefLabel | "percent"
## | code:procedure-percent | skos:inScheme | code:procedure
## | code:procedure-percent | rrdfqbc rnd0:RdescStatDefFun | "function (x) { -1 }"
## | code:procedure-percent | rrdfqbc rnd0:R-selectionvalue | "percent"
## | code:procedure-percent | rrdfqbc rnd0:R-selectionoperator | "=="
## | code:procedure-percent | rdfs:comment | "Descriptive statistics percent"@en
## | code:procedure-percent | rdf:type | skos:Concept
## | code:procedure-percent | rdf:type | code:Procedure
## -----

```

Get definition for all variables used for descriptive statistics - class `code:factor`

The SPARQL script shows how the R function definition for the descriptive statistics is stored in the cube.

```

cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOfactor.rq

```

```

## -----
## | factor | prefLabel | DataSetRefD2RQ | Rselectionvalue |
## =====
## | code:factor-_ALL_ | "_ALL_" | | |
## | code:factor-proportion | "proportion" | | "proportion" |
## | code:factor-weightbl | "weightbl" | rrdfqbc rnd0:ADSL_WEIGHTBL | "weightbl" |
## | code:factor-_NONMISS_ | "_NONMISS_" | | |
## | code:factor-quantity | "quantity" | | "quantity" |
## | code:factor-age | "age" | rrdfqbc rnd0:ADSL_AGE | "age" |
## -----

```

Get the codelist definition for all variables used for descriptive statistics - class `code:factor`

The SPARQL script shows how the R function definition for the descriptive statistics is stored in the cube.

```
cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOfactor-codelist.rq
```

```
## -----
## | s | p | o |
## =====
## | code:factor-weightbl | skos:topConceptOf | code:factor |
## | code:factor-weightbl | skos:prefLabel | "weightbl" |
## | code:factor-weightbl | skos:inScheme | code:factor |
## | code:factor-weightbl | rrdfqbcrnd0:R-selectionvalue | "weightbl" |
## | code:factor-weightbl | rrdfqbcrnd0:R-selectionoperator | "==" |
## | code:factor-weightbl | rrdfqbcrnd0:DataSetRefD2RQ | rrdfqbcrnd0:ADSL_WEIGHTBL |
## | code:factor-weightbl | rdfs:comment | "Coded values from data source. No record" |
## | code:factor-weightbl | rdf:type | skos:Concept |
## | code:factor-weightbl | rdf:type | code:Factor |
## | code:factor-age | skos:topConceptOf | code:factor |
## | code:factor-age | skos:prefLabel | "age" |
## | code:factor-age | skos:inScheme | code:factor |
## | code:factor-age | rrdfqbcrnd0:R-selectionvalue | "age" |
## | code:factor-age | rrdfqbcrnd0:R-selectionoperator | "==" |
## | code:factor-age | rrdfqbcrnd0:DataSetRefD2RQ | rrdfqbcrnd0:ADSL_AGE |
## | code:factor-age | rdfs:comment | "Coded values from data source. No record" |
## | code:factor-age | rdf:type | skos:Concept |
## | code:factor-age | rdf:type | code:Factor |
## | code:factor-_ALL_ | skos:topConceptOf | code:factor |
## | code:factor-_ALL_ | skos:prefLabel | "_ALL_" |
## | code:factor-_ALL_ | skos:inScheme | code:factor |
## | code:factor-_ALL_ | rdfs:comment | "NON-CDISC: Represents all codelist categories" |
## | code:factor-_ALL_ | rdf:type | skos:Concept |
## | code:factor-_ALL_ | rdf:type | code:Factor |
## | code:factor-quantity | skos:topConceptOf | code:factor |
## | code:factor-quantity | skos:prefLabel | "quantity" |
## | code:factor-quantity | skos:inScheme | code:factor |
## | code:factor-quantity | rrdfqbcrnd0:R-selectionvalue | "quantity" |
## | code:factor-quantity | rrdfqbcrnd0:R-selectionoperator | "==" |
## | code:factor-quantity | rdfs:comment | "Coded values from data source. No record" |
## | code:factor-quantity | rdf:type | skos:Concept |
## | code:factor-quantity | rdf:type | code:Factor |
## | code:factor-_NONMISS_ | skos:topConceptOf | code:factor |
## | code:factor-_NONMISS_ | skos:prefLabel | "_NONMISS_" |
## | code:factor-_NONMISS_ | skos:inScheme | code:factor |
## | code:factor-_NONMISS_ | rrdfqbcrnd0:R-selectionfunction | "is.na" |
## | code:factor-_NONMISS_ | rdfs:comment | "NON-CDISC: Represents the non-missing categories" |
## | code:factor-_NONMISS_ | rdf:type | skos:Concept |
## | code:factor-_NONMISS_ | rdf:type | code:Factor |
## | code:factor-proportion | skos:topConceptOf | code:factor |
## | code:factor-proportion | skos:prefLabel | "proportion" |
## | code:factor-proportion | skos:inScheme | code:factor |
## | code:factor-proportion | rrdfqbcrnd0:R-selectionvalue | "proportion" |
## | code:factor-proportion | rrdfqbcrnd0:R-selectionoperator | "==" |
## | code:factor-proportion | rdfs:comment | "Coded values from data source. No record" |
## | code:factor-proportion | rdf:type | skos:Concept |
## | code:factor-proportion | rdf:type | code:Factor |
```

```
## -----
```

Get definition for descriptive statistics median

The SPARQL script shows how the function definition for the descriptive statistics is stored in the cube.

```
cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOprocedure-median.rq
```

```
## -----
```

s	p	o
code:procedure-median	skos:topConceptOf	code:procedure
code:procedure-median	skos:prefLabel	"median"
code:procedure-median	skos:inScheme	code:procedure
code:procedure-median	rrdfqbcrnd0:RdescStatDefFun	"function (x) { median(x, na.rm = T
code:procedure-median	rrdfqbcrnd0:R-selectionvalue	"median"
code:procedure-median	rrdfqbcrnd0:R-selectionoperator	"=="
code:procedure-median	rdfs:comment	"Descriptive statistics median"@en
code:procedure-median	rdf:type	skos:Concept
code:procedure-median	rdf:type	code:Procedure

```
## -----
```

Get information for selection of data

The SPARQL script shows how the information for selecting data for derivation of univariate statistics is present in the cube.

```
cd ../extdata/sample-rdf
arq --data DC-DEMO-sample.ttl --query DEMOobservations-R-selection.rq
```

```
## -----
```

obs	rrdfqbcrnd0Rcolumnname	Rselectionoperator	Rselectionvalue
ds:obs027	"trt01a"	"=="	"Xanomeline High Dose"
ds:obs056	"agegr1"	"=="	"65-80"
ds:obs056	"trt01a"	"=="	"Xanomeline Low Dose"

```
## -----
```

Get information on the underlying data in D2RQ format

The following two SPARQL scripts are from taken from create-ADSL-ttl.Rmd.

First get the mapping information.

```
cd ../extdata/sample-rdf
arq --data adsl-map.ttl --query ADSL-mapping.rq
```

```
## -----
```

mapColumn	d2rqcolumn	d2rqdatatype
-----------	------------	--------------

```

## =====
## | <adsl-map.ttl#ADSL_COMP24FL> | "ADSL.COMP24FL" |
## | <adsl-map.ttl#ADSL_DCREASCD> | "ADSL.DCREASCD" |
## | <adsl-map.ttl#ADSL_DTHFL> | "ADSL.DTHFL" |
## | <adsl-map.ttl#ADSL_TRTSDT> | "ADSL.TRSDT" | xsd:double
## | <adsl-map.ttl#ADSL_RFENDT> | "ADSL.RFENDT" | xsd:double
## | <adsl-map.ttl#ADSL_DCDECOD> | "ADSL.DCDECOD" |
## | <adsl-map.ttl#ADSL_RFENDTC> | "ADSL.RFENDTC" |
## | <adsl-map.ttl#ADSL_CUMDOSE> | "ADSL.CUMDOSE" | xsd:double
## | <adsl-map.ttl#ADSL_TRT01A> | "ADSL.TR01A" |
## | <adsl-map.ttl#ADSL_AGEGR1> | "ADSL.AGEGR1" |
## | <adsl-map.ttl#ADSL_USUBJID> | "ADSL.USUBJID" |
## | <adsl-map.ttl#ADSL_TRT01PN> | "ADSL.TR01PN" | xsd:double
## | <adsl-map.ttl#ADSL_ITTFL> | "ADSL.ITTFL" |
## | <adsl-map.ttl#ADSL_SITEGR1> | "ADSL.SITEGR1" |
## | <adsl-map.ttl#ADSL_SEX> | "ADSL.SEX" |
## | <adsl-map.ttl#ADSL_ETHNIC> | "ADSL.ETHNIC" |
## | <adsl-map.ttl#ADSL_COMP8FL> | "ADSL.COMP8FL" |
## | <adsl-map.ttl#ADSL_RFSTDTC> | "ADSL.RFSTDTC" |
## | <adsl-map.ttl#ADSL_AGE> | "ADSL.AGE" | xsd:double
## | <adsl-map.ttl#ADSL_VISNUMEN> | "ADSL.VISNUMEN" | xsd:double
## | <adsl-map.ttl#ADSL_EFFFL> | "ADSL.EFFFL" |
## | <adsl-map.ttl#ADSL_SAFFL> | "ADSL.SAFFL" |
## | <adsl-map.ttl#ADSL_HEIGHTBL> | "ADSL.HEIGHTBL" | xsd:double
## | <adsl-map.ttl#ADSL_MMSETOT> | "ADSL.MMSETOT" | xsd:double
## | <adsl-map.ttl#ADSL_STUDYID> | "ADSL.STUDYID" |
## | <adsl-map.ttl#ADSL_RACEN> | "ADSL.RACEN" | xsd:double
## | <adsl-map.ttl#ADSL_DISONSDT> | "ADSL.DISONSDT" | xsd:double
## | <adsl-map.ttl#ADSL_BMIBL> | "ADSL.BMIBL" | xsd:double
## | <adsl-map.ttl#ADSL_DSRAEFL> | "ADSL.DSRAEFL" |
## | <adsl-map.ttl#ADSL_AGEU> | "ADSL.AGEU" |
## | <adsl-map.ttl#ADSL_DURDIS> | "ADSL.DURDIS" | xsd:double
## | <adsl-map.ttl#ADSL_TRTDUR> | "ADSL.TRDUR" | xsd:double
## | <adsl-map.ttl#ADSL_VISIT1DT> | "ADSL.VISIT1DT" | xsd:double
## | <adsl-map.ttl#ADSL_SUBJID> | "ADSL.SUBJID" |
## | <adsl-map.ttl#ADSL_AVGDD> | "ADSL.AVGDD" | xsd:double
## | <adsl-map.ttl#ADSL_WEIGHTBL> | "ADSL.WEIGHTBL" | xsd:double
## | <adsl-map.ttl#ADSL_EDUCLVL> | "ADSL.EDUCLVL" | xsd:double
## | <adsl-map.ttl#ADSL_SITEID> | "ADSL.SITEID" |
## | <adsl-map.ttl#ADSL_COMP16FL> | "ADSL.COMP16FL" |
## | <adsl-map.ttl#ADSL_RACE> | "ADSL.RACE" |
## | <adsl-map.ttl#ADSL_TRTEDT> | "ADSL.TRTEDT" | xsd:double
## | <adsl-map.ttl#ADSL_DISCONFL> | "ADSL.DISCONFL" |
## | <adsl-map.ttl#ADSL_ARM> | "ADSL.ARM" |
## | <adsl-map.ttl#ADSL_DURDSGR1> | "ADSL.DURDSGR1" |
## | <adsl-map.ttl#ADSL_AGEGR1N> | "ADSL.AGEGR1N" | xsd:double
## | <adsl-map.ttl#ADSL_TRT01P> | "ADSL.TR01P" |
## | <adsl-map.ttl#ADSL_TRT01AN> | "ADSL.TR01AN" | xsd:double
## | <adsl-map.ttl#ADSL_BMIBLGR1> | "ADSL.BMIBLGR1" |
## -----

```

Then dump the contents of a record in the database.


```
cd ../extdata/sample-rdf
arq --data adsl.ttl --query ADSL-record.rq
```

[illegible]

```
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_A
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_S
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_E
## -----
```

Get underlying data for one cube observation

```
cd ../extdata/sample-rdf
arg --data adsl.ttl --data DC-DEMO-sample.ttl --query DEMOobservations-R-data.rq
```

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

```
## | <http://www.example.org/datasets/ADSL/01-701-1387> | <http://www.example.org/datasets/vocab/ADSL_01-701-1387>  
## | <http://www.example.org/datasets/ADSL/01-701-1387> | <http://www.example.org/datasets/vocab/ADSL_SU<br></pre>
```

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

```
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_RL
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_RL
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_HI
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_C
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_E
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_S
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_A
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_A
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_A
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_C
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_RL
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_S
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_S
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_M
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_D
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_RL
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_I
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_A
## | <http://www.example.org/datasets/ADSL/01-710-1271> | <http://www.example.org/datasets/vocab/ADSL_RL
## | -----
```

How to run this .Rmd file

.. add text ..