Using ARQ to make SPARQL queries

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Contents

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                                          | proc
## =========================================================================================================
## | ds:obs001 | code:ethnic-_ALL_                  | code:race-_ALL_                               | code
## | ds:obs002 | code:ethnic-_ALL_                  | code:race-_ALL_                               | code
## | ds:obs003 | code:ethnic-_ALL_                  | code:race-_ALL_                               | code
## | ds:obs004 | code:ethnic-_ALL_                  | code:race-_ALL_                               | code
## | ds:obs005 | code:ethnic-_ALL_                  | code:race-_ALL_                               | code
## | ds:obs006 | code:ethnic-_ALL_                  | code:race-_ALL_                               | code
```

```
## | ds:obs007 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs008 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs009 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs010 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs011 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs012 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs013 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs014 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs015 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs016 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs017 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs018 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs019 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs020 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs021 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs022 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs023 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs024 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs025 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs026 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs027 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs028 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs029 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs030 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs031 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs032 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs033 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs034 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs035 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs036 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs037 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs038 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs039 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs040 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs041 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs042 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs043 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs044 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs045 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs046 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs047 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs048 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs049 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs050 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs051 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs052 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs053 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs054 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs055 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs056 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs057 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs058 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs059 | code:ethnic-_ALL_                | code:race-_ALL_                | code
## | ds:obs060 | code:ethnic-_ALL_                | code:race-_ALL_                | code
```

```
## | ds:obs061 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs062 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs063 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs064 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs065 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs066 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs067 | code:ethnic-_ALL_                | code:race-_NONMISS_                            | code
## | ds:obs068 | code:ethnic-_ALL_                | code:race-_NONMISS_                            | code
## | ds:obs069 | code:ethnic-_ALL_                | code:race-_NONMISS_                            | code
## | ds:obs070 | code:ethnic-_ALL_                | code:race-_NONMISS_                            | code
## | ds:obs071 | code:ethnic-_ALL_                | code:race-_NONMISS_                            | code
## | ds:obs072 | code:ethnic-_ALL_                | code:race-_NONMISS_                            | code
## | ds:obs073 | code:ethnic-_ALL_                | code:race-WHITE                                | code
## | ds:obs074 | code:ethnic-_ALL_                | code:race-WHITE                                | code
## | ds:obs075 | code:ethnic-_ALL_                | code:race-WHITE                                | code
## | ds:obs076 | code:ethnic-_ALL_                | code:race-WHITE                                | code
## | ds:obs077 | code:ethnic-_ALL_                | code:race-WHITE                                | code
## | ds:obs078 | code:ethnic-_ALL_                | code:race-WHITE                                | code
## | ds:obs079 | code:ethnic-_ALL_                | code:race-BLACK_OR_AFRICAN_AMERICAN            | code
## | ds:obs080 | code:ethnic-_ALL_                | code:race-BLACK_OR_AFRICAN_AMERICAN            | code
## | ds:obs081 | code:ethnic-_ALL_                | code:race-BLACK_OR_AFRICAN_AMERICAN            | code
## | ds:obs082 | code:ethnic-_ALL_                | code:race-BLACK_OR_AFRICAN_AMERICAN            | code
## | ds:obs083 | code:ethnic-_ALL_                | code:race-BLACK_OR_AFRICAN_AMERICAN            | code
## | ds:obs084 | code:ethnic-_ALL_                | code:race-BLACK_OR_AFRICAN_AMERICAN            | code
## | ds:obs085 | code:ethnic-_ALL_                | code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE     | code
## | ds:obs086 | code:ethnic-_ALL_                | code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE     | code
## | ds:obs087 | code:ethnic-_ALL_                | code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE     | code
## | ds:obs088 | code:ethnic-_ALL_                | code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE     | code
## | ds:obs089 | code:ethnic-_ALL_                | code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE     | code
## | ds:obs090 | code:ethnic-_ALL_                | code:race-AMERICAN_INDIAN_OR_ALASKA_NATIVE     | code
## | ds:obs091 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs092 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs093 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs094 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs095 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs096 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs097 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs098 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs099 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs100 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs101 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs102 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs103 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs104 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs105 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs106 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs107 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs108 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs109 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs110 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs111 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs112 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs113 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
## | ds:obs114 | code:ethnic-_ALL_                | code:race-_ALL_                                | code
```

```
## | ds:obs115 | code:ethnic-_NONMISS_              | code:race-_ALL_                          | code
## | ds:obs116 | code:ethnic-_NONMISS_              | code:race-_ALL_                          | code
## | ds:obs117 | code:ethnic-_NONMISS_              | code:race-_ALL_                          | code
## | ds:obs118 | code:ethnic-_NONMISS_              | code:race-_ALL_                          | code
## | ds:obs119 | code:ethnic-_NONMISS_              | code:race-_ALL_                          | code
## | ds:obs120 | code:ethnic-_NONMISS_              | code:race-_ALL_                          | code
## | ds:obs121 | code:ethnic-NOT_HISPANIC_OR_LATINO | code:race-_ALL_                          | code
## | ds:obs122 | code:ethnic-NOT_HISPANIC_OR_LATINO | code:race-_ALL_                          | code
## | ds:obs123 | code:ethnic-NOT_HISPANIC_OR_LATINO | code:race-_ALL_                          | code
## | ds:obs124 | code:ethnic-NOT_HISPANIC_OR_LATINO | code:race-_ALL_                          | code
## | ds:obs125 | code:ethnic-NOT_HISPANIC_OR_LATINO | code:race-_ALL_                          | code
## | ds:obs126 | code:ethnic-NOT_HISPANIC_OR_LATINO | code:race-_ALL_                          | code
## | ds:obs127 | code:ethnic-HISPANIC_OR_LATINO     | code:race-_ALL_                          | code
## | ds:obs128 | code:ethnic-HISPANIC_OR_LATINO     | code:race-_ALL_                          | code
## | ds:obs129 | code:ethnic-HISPANIC_OR_LATINO     | code:race-_ALL_                          | code
## | ds:obs130 | code:ethnic-HISPANIC_OR_LATINO     | code:race-_ALL_                          | code
## | ds:obs131 | code:ethnic-HISPANIC_OR_LATINO     | code:race-_ALL_                          | code
## | ds:obs132 | code:ethnic-HISPANIC_OR_LATINO     | 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"^^xsd:string     | "function (x)  {     max(x, na.rm = TRUE) }"
## | code:procedure-std     | "std"^^xsd:string     | "function (x)  {     sd(x, na.rm = TRUE) }"
## | code:procedure-mean    | "mean"^^xsd:string    | "function (x)  {     mean(x, na.rm = TRUE) }"
## | code:procedure-min     | "min"^^xsd:string     | "function (x)  {     min(x, na.rm = TRUE) }"
## | code:procedure-percent | "percent"^^xsd:string | "function (x)  {     -1 }"
## | code:procedure-count   | "count"^^xsd:string   | "function (x)  {     length(x) }"
## | code:procedure-q3      | "q3"^^xsd:string      | "function (x)  {     quantile(x, probs = c(0.75),
## | code:procedure-n       | "n"^^xsd:string       | "function (x)  {     length(x[!is.na(x)]) }"
## | code:procedure-median  | "median"^^xsd:string  | "function (x)  {     median(x, na.rm = TRUE) }"
## | code:procedure-q1      | "q1"^^xsd:string      | "function (x)  {     quantile(x, probs = c(0.25),
## ------------------------------------------------------------------------------------------------------
```

Get the codelists

The SPARQL script shows the codelist.

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

```
## ------------------------------------------------------------------------------------------------------
## | DataStructureDefinition | dimension               | cprefLabel                    | cl
```

```
## ==========================================================================
## | ds:dsd-DEMO             | crnd-dimension:agegr1    | "Codelist scheme: agegr1"@en    | code:agegr1-
## | ds:dsd-DEMO             | crnd-dimension:agegr1    | "Codelist scheme: agegr1"@en    | code:agegr1-
## | ds:dsd-DEMO             | crnd-dimension:agegr1    | "Codelist scheme: agegr1"@en    | code:agegr1-
## | ds:dsd-DEMO             | crnd-dimension:agegr1    | "Codelist scheme: agegr1"@en    | code:agegr1-
## | ds:dsd-DEMO             | crnd-dimension:agegr1    | "Codelist scheme: agegr1"@en    | code:agegr1-
## | ds:dsd-DEMO             | crnd-dimension:ethnic    | "Codelist scheme: ethnic"@en    | code:ethnic-
## | ds:dsd-DEMO             | crnd-dimension:ethnic    | "Codelist scheme: ethnic"@en    | code:ethnic-
## | ds:dsd-DEMO             | crnd-dimension:ethnic    | "Codelist scheme: ethnic"@en    | code:ethnic-
## | ds:dsd-DEMO             | crnd-dimension:ethnic    | "Codelist scheme: ethnic"@en    | code:ethnic-
## | ds:dsd-DEMO             | crnd-dimension:factor    | "Codelist scheme: factor"@en    | code:factor-
## | ds:dsd-DEMO             | crnd-dimension:factor    | "Codelist scheme: factor"@en    | code:factor-
## | ds:dsd-DEMO             | crnd-dimension:factor    | "Codelist scheme: factor"@en    | code:factor-
## | ds:dsd-DEMO             | crnd-dimension:factor    | "Codelist scheme: factor"@en    | code:factor-
## | ds:dsd-DEMO             | crnd-dimension:factor    | "Codelist scheme: factor"@en    | code:factor-
## | ds:dsd-DEMO             | crnd-dimension:factor    | "Codelist scheme: factor"@en    | code:factor-
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:procedure | "Codelist scheme: procedure"@en | code:procedu
## | ds:dsd-DEMO             | crnd-dimension:race      | "Codelist scheme: race"@en      | code:race-AM
## | ds:dsd-DEMO             | crnd-dimension:race      | "Codelist scheme: race"@en      | code:race-AS
## | ds:dsd-DEMO             | crnd-dimension:race      | "Codelist scheme: race"@en      | code:race-BL
## | ds:dsd-DEMO             | crnd-dimension:race      | "Codelist scheme: race"@en      | code:race-NA
## | ds:dsd-DEMO             | crnd-dimension:race      | "Codelist scheme: race"@en      | code:race-WH
## | ds:dsd-DEMO             | crnd-dimension:race      | "Codelist scheme: race"@en      | code:race-_A
## | ds:dsd-DEMO             | crnd-dimension:race      | "Codelist scheme: race"@en      | code:race-_N
## | ds:dsd-DEMO             | crnd-dimension:sex       | "Codelist scheme: sex"@en       | code:sex-F
## | ds:dsd-DEMO             | crnd-dimension:sex       | "Codelist scheme: sex"@en       | code:sex-M
## | ds:dsd-DEMO             | crnd-dimension:sex       | "Codelist scheme: sex"@en       | code:sex-U
## | ds:dsd-DEMO             | crnd-dimension:sex       | "Codelist scheme: sex"@en       | code:sex-UN
## | ds:dsd-DEMO             | crnd-dimension:sex       | "Codelist scheme: sex"@en       | code:sex-_AL
## | ds:dsd-DEMO             | crnd-dimension:sex       | "Codelist scheme: sex"@en       | code:sex-_NO
## | ds:dsd-DEMO             | crnd-dimension:trt01a    | "Codelist scheme: trt01a"@en    | code:trt01a-
## | ds:dsd-DEMO             | crnd-dimension:trt01a    | "Codelist scheme: trt01a"@en    | code:trt01a-
## | ds:dsd-DEMO             | crnd-dimension:trt01a    | "Codelist scheme: trt01a"@en    | code:trt01a-
## | ds:dsd-DEMO             | crnd-dimension:trt01a    | "Codelist scheme: trt01a"@en    | code:trt01a-
## | ds:dsd-DEMO             | crnd-dimension:trt01a    | "Codelist scheme: trt01a"@en    | code:trt01a-
## --------------------------------------------------------------------------
```

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"^^xsd:string
## | code:procedure-min      | skos:inScheme                      | code:procedure
## | code:procedure-min      | rrdfqbcrnd0:RdescStatDefFun        | "function (x)  {     min(x, na.rm = TRU
## | code:procedure-min      | rrdfqbcrnd0:R-selectionvalue       | "min"^^xsd:string
## | code:procedure-min      | rrdfqbcrnd0:R-selectionoperator    | "=="^^xsd:string
## | 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"^^xsd:string
## | 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"^^xsd:string
## | code:procedure-std      | rrdfqbcrnd0:R-selectionoperator    | "=="^^xsd:string
## | 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"^^xsd:string
## | code:procedure-q3       | skos:inScheme                      | code:procedure
## | code:procedure-q3       | rrdfqbcrnd0:RdescStatDefFun        | "function (x)  {     quantile(x, probs =
## | code:procedure-q3       | rrdfqbcrnd0:R-selectionvalue       | "q3"^^xsd:string
## | code:procedure-q3       | rrdfqbcrnd0:R-selectionoperator    | "=="^^xsd:string
## | 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"^^xsd:string
## | 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"^^xsd:string
## | code:procedure-median   | rrdfqbcrnd0:R-selectionoperator    | "=="^^xsd:string
## | 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"^^xsd:string
## | code:procedure-count    | skos:inScheme                      | code:procedure
## | code:procedure-count    | rrdfqbcrnd0:RdescStatDefFun        | "function (x)  {     length(x) }"
## | code:procedure-count    | rrdfqbcrnd0:R-selectionvalue       | "count"^^xsd:string
## | code:procedure-count    | rrdfqbcrnd0:R-selectionoperator    | "=="^^xsd:string
## | 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"^^xsd:string
## | code:procedure-max      | skos:inScheme                      | code:procedure
## | code:procedure-max      | rrdfqbcrnd0:RdescStatDefFun        | "function (x)  {     max(x, na.rm = TRU
## | code:procedure-max      | rrdfqbcrnd0:R-selectionvalue       | "max"^^xsd:string
## | code:procedure-max      | rrdfqbcrnd0:R-selectionoperator    | "=="^^xsd:string
```

```
## | 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"^^xsd:string
## | code:procedure-mean    | skos:inScheme                  | code:procedure
## | code:procedure-mean    | rrdfqbcrnd0:RdescStatDefFun    | "function (x)  {     mean(x, na.rm = TRU
## | code:procedure-mean    | rrdfqbcrnd0:R-selectionvalue   | "mean"^^xsd:string
## | code:procedure-mean    | rrdfqbcrnd0:R-selectionoperator | "=="^^xsd:string
## | 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"^^xsd:string
## | code:procedure-q1      | skos:inScheme                  | code:procedure
## | code:procedure-q1      | rrdfqbcrnd0:RdescStatDefFun    | "function (x)  {     quantile(x, probs =
## | code:procedure-q1      | rrdfqbcrnd0:R-selectionvalue   | "q1"^^xsd:string
## | code:procedure-q1      | rrdfqbcrnd0:R-selectionoperator | "=="^^xsd:string
## | 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"^^xsd:string
## | code:procedure-n       | skos:inScheme                  | code:procedure
## | code:procedure-n       | rrdfqbcrnd0:RdescStatDefFun    | "function (x)  {     length(x[!is.na(x)]
## | code:procedure-n       | rrdfqbcrnd0:R-selectionvalue   | "n"^^xsd:string
## | code:procedure-n       | rrdfqbcrnd0:R-selectionoperator | "=="^^xsd:string
## | 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"^^xsd:string
## | code:procedure-percent | skos:inScheme                  | code:procedure
## | code:procedure-percent | rrdfqbcrnd0:RdescStatDefFun    | "function (x)  {     -1 }"
## | code:procedure-percent | rrdfqbcrnd0:R-selectionvalue   | "percent"^^xsd:string
## | code:procedure-percent | rrdfqbcrnd0:R-selectionoperator | "=="^^xsd:string
## | 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_"^^xsd:string      |                          |
## | code:factor-proportion | "proportion"^^xsd:string |                          | "proportion"^^xsd:s
```

```
## | code:factor-weightbl   | "weightbl"^^xsd:string   | rrdfqbcrnd0:ADSL_WEIGHTBL | "weightbl"^^xsd:st
## | code:factor-_NONMISS_  | "_NONMISS_"^^xsd:string  |                           |
## | code:factor-quantity   | "quantity"^^xsd:string   |                           | "quantity"^^xsd:st
## | code:factor-age        | "age"^^xsd:string        | rrdfqbcrnd0:ADSL_AGE      | "age"^^xsd:string
## ------------------------------------------------------------------------------------------------------
```

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"^^xsd:string
## | code:factor-weightbl   | skos:inScheme                    | code:factor
## | code:factor-weightbl   | rrdfqbcrnd0:R-selectionvalue     | "weightbl"^^xsd:string
## | code:factor-weightbl   | rrdfqbcrnd0:R-selectionoperator  | "=="^^xsd:string
## | code:factor-weightbl   | rrdfqbcrnd0:DataSetRefD2RQ       | rrdfqbcrnd0:ADSL_WEIGHTBL
## | code:factor-weightbl   | rdfs:comment                     | "Coded values from data source. No reco
## | 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"^^xsd:string
## | code:factor-age        | skos:inScheme                    | code:factor
## | code:factor-age        | rrdfqbcrnd0:R-selectionvalue     | "age"^^xsd:string
## | code:factor-age        | rrdfqbcrnd0:R-selectionoperator  | "=="^^xsd:string
## | code:factor-age        | rrdfqbcrnd0:DataSetRefD2RQ       | rrdfqbcrnd0:ADSL_AGE
## | code:factor-age        | rdfs:comment                     | "Coded values from data source. No reco
## | 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_"^^xsd:string
## | code:factor-_ALL_      | skos:inScheme                    | code:factor
## | code:factor-_ALL_      | rdfs:comment                     | "NON-CDISC: Represents all codelist cat
## | 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"^^xsd:string
## | code:factor-quantity   | skos:inScheme                    | code:factor
## | code:factor-quantity   | rrdfqbcrnd0:R-selectionvalue     | "quantity"^^xsd:string
## | code:factor-quantity   | rrdfqbcrnd0:R-selectionoperator  | "=="^^xsd:string
## | code:factor-quantity   | rdfs:comment                     | "Coded values from data source. No reco
## | 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_"^^xsd:string
## | code:factor-_NONMISS_  | skos:inScheme                    | code:factor
## | code:factor-_NONMISS_  | rrdfqbcrnd0:R-selectionfunction  | "is.na"^^xsd:string
```

```
## | code:factor-_NONMISS_  | rdfs:comment                    | "NON-CDISC: Represents the non-missing
## | 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"^^xsd:string
## | code:factor-proportion | skos:inScheme                   | code:factor
## | code:factor-proportion | rrdfqbcrnd0:R-selectionvalue    | "proportion"^^xsd:string
## | code:factor-proportion | rrdfqbcrnd0:R-selectionoperator | "=="^^xsd:string
## | code:factor-proportion | rdfs:comment                    | "Coded values from data source. No reco
## | 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"^^xsd:string
## | 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"^^xsd:string
## | code:procedure-median | rrdfqbcrnd0:R-selectionoperator | "=="^^xsd:string
## | 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"^^xsd:string   | "=="^^xsd:string   | "Xanomeline High Dose"^^xsd:string |
## | ds:obs056 | "agegr1"^^xsd:string   | "=="^^xsd:string   | "65-80"^^xsd:string                |
## | ds:obs056 | "trt01a"^^xsd:string   | "=="^^xsd:string   | "Xanomeline Low Dose"^^xsd:string  |
## ------------------------------------------------------------------------------------------------
```

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.TRTSDT"   | 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.TRT01A"   |              |
## | <adsl-map.ttl#ADSL_AGEGR1>     | "ADSL.AGEGR1"   |              |
## | <adsl-map.ttl#ADSL_USUBJID>    | "ADSL.USUBJID"  |              |
## | <adsl-map.ttl#ADSL_TRT01PN>    | "ADSL.TRT01PN"  | 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.TRTDUR"   | 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.TRT01P"   |             |
## | <adsl-map.ttl#ADSL_TRT01AN>  | "ADSL.TRT01AN"  | 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
```

```
## -----------------------------------------------------------------------------------------------
## | s                                                   | p
## ===============================================================================================
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_E
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_D
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_T
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_C
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_C
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_T
## | <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_T
## | <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_D
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_T
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_H
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_C
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_D
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_W
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_B
## | <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_T
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_D
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_R
## | <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_D
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_D
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_C
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_R
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.w3.org/2000/01/rdf-schema#label>
## | <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_A
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_E
## | <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_D
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_T
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_D
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_M
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_V
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_U
```

```
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_I
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_B
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_R
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.w3.org/1999/02/22-rdf-syntax-ns#t
## | <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_R
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_V
## | <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_T
## | <http://www.example.org/datasets/ADSL/01-718-1254> | <http://www.example.org/datasets/vocab/ADSL_R
## | <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
arq --data adsl.ttl --data DC-DEMO-sample.ttl --query DEMOobservations-R-data.rq
```

```
## ------------------
## | record | p | o |
## ==================
## ------------------
```

How to run this .Rmd file

.. add text ..