SPARQL queries on statistics.gov.scot & Utility Scenario
Revised

Two Scenarios to fetch its data
Standard Dimension: Time (years)
Two Topics: Environment & Housing

Scenario	First Row	Second Row	Third Row	Fourth Row	[…]
1	Year	Percent of renewable energy of the total energy consumption	Total emissions (Metric Tons of CO2eq)	Transport emissions (Metric Tons of CO2eq)	
2	Year	Count_of_Births	Number of Dwellings in Scotland (Country)	Number of Dwellings in Aberdeenshire (Council Area)	Number of Dwellings in […] (Council Area)

Scenario 1

Scenario	First Row	Second Row	Third Row	Fourth Row	[…]
1	Year	Percent of renewable energy of the total energy consumption	Total emissions (Metric Tons of CO2eq)	Transport emissions (Metric Tons of CO2eq)	

We are trying to figure out if renewable energy led to lower carbon dioxide emissions.
With the accession of the emissions from transport we will try also to conclude if transport became “greener” than it was thanks to renewable energy (of course is not the only one variable which affects transport emissions).
Comparing with the best countries in this field (The Netherlands) we will try to understand if Scotland has become better in this field and if there are any future prospects in “green transport”.

Scenario 1 - the query (1)

```
SELECT ?Year ?Percent_of_renewable ?Metric_Tons_of_CO2eq ?Transport_Emissions_Metric_Tons_of_CO2eq
WHERE {
#We fetch the first dataset of renewable energy consumption#
?a qb:dataSet <http://statistics.gov.scot/data/renewable-electricity>;
      <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S92000003>;
#We assing the triplets to our desired variable#
      <http://statistics.gov.scot/def/measure-properties/ratio> ?Percent_of_renewable;
#We assign the available years in a dummy variable#
      <http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1.
#And we get from this variable the actual string#
?dummy1 rdfs:label ?Year.

#we follow the same procedure for the next dataset but,#
?b qb:dataSet <http://statistics.gov.scot/data/greenhouse-gas>;
<http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S92000003>;
<http://statistics.gov.scot/def/measure-properties/count> ?Metric_Tons_of_CO2eq;
#We link the second dataset to the reference_periods of the first one (!)#
<http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1.


[…]
```

Scenario 1 - the query (2)

[…]

#in the same way for the third dataset (emissions of transport)#
?c qb:dataSet <http://statistics.gov.scot/data/greenhouse-gas-emissions-by-source-sector>;
<http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S92000003>;
<http://statistics.gov.scot/def/dimension/greenhouseGasSourceSector> <http://statistics.gov.scot/def/concept/greenhouse-gas-source-secto
transport-excluding-international-aviation-and-shipping>;
<http://statistics.gov.scot/def/dimension/pollutant> <http://statistics.gov.scot/def/concept/pollutant/co2>;
<http://statistics.gov.scot/def/measure-properties/count> ?Transport_Emissions_Metric_Tons_of_CO2eq;
#We link the third dataset to the reference periods of the first one#
<http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1.
}
#We order the results by year#
ORDER BY ASC(?Year)
LIMIT 100

Scenario 1 - the results

Year	Percent_of_renewable	Metric_Tons_of_CO2eq	Transport_Emissions_Metric_Tons_of_CO2eq
2000	12.2	74.712	10.864
2001	10.4	73.879	10.846
2002	12.3	69.489	11.174
2003	9	69.506	11.213
2004	14.1	67.196	11.315
2005	15.5	65.856	11.468
2006	16.8	68.989	11.647
2007	19.7	64.163	11.831
2008	22.1	61.867	11.395
2009	27.2	57.247	10.94

LOAD MORE ROWS

Ready

Scenario 2

Scenario	First Row	Second Row	Third Row	Fourth Row	[…]
2	Year	Count_of_Births	Number of Dwellings in Scotland (Country)	Number of Dwellings in Aberdeenshire (Council Area)	Number of Dwellings in […] (Council Area)

In this dataset we will try to figure out if the total counts of births in Scotland are related with the number of dwellings in Scotland, but also in the 3 most populated council areas.
We will try to find out if there is a positive correlation between these two variables.
By this way we will be able to predict the future tendencies in real estate and if the demand follows the supply.
Of course we have to consider that births are related to newborns who will have their own families in 30 years [multiplier effect / under no special circumstances].
For further study, we could also include the number of total deaths in order to create a balance of population.
Following the same approach we could also fetch the data for the births in each territory (council areas).
We have also to consider the number of immigrants in the country.

Scenario 2 - the query

```
SELECT ?Year ?Count_of_births ?Dwellings_Scotland ?Dwellings_Aberdeenshire ?Dwellings_City_of_Edinburgh ?Dwellings_Glasgow_City
WHERE {
?a qb:dataSet <http://statistics.gov.scot/data/births>;
    <http://statistics.gov.scot/def/dimension/gender> <http://statistics.gov.scot/def/concept/gender/all>;
     <http://statistics.gov.scot/def/dimension/timePeriod> <http://statistics.gov.scot/def/concept/time-period/calendar-year>;
      <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S92000003>;
  <http://statistics.gov.scot/def/measure-properties/count> ?Count_of_births.
?a <http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1.
  ?dummy1 rdfs:label ?Year.


?b qb:dataSet  <http://statistics.gov.scot/data/dwellings-council-tax>;
        <http://purl.org/linked-data/cube#measureType> <http://statistics.gov.scot/def/measure-properties/count>;
        <http://statistics.gov.scot/def/dimension/councilTaxBand> <http://statistics.gov.scot/def/concept/council-tax-band/total-dwellings>;
        <http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1;
        <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S92000003>;
        <http://statistics.gov.scot/def/measure-properties/count> ?Dwellings_Scotland.

#we fetch each geographical area seperately#
?c qb:dataSet  <http://statistics.gov.scot/data/dwellings-council-tax>;
        <http://purl.org/linked-data/cube#measureType> <http://statistics.gov.scot/def/measure-properties/count>;
        <http://statistics.gov.scot/def/dimension/councilTaxBand> <http://statistics.gov.scot/def/concept/council-tax-band/total-dwellings>;
        <http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1;
        <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S12000034>;
        <http://statistics.gov.scot/def/measure-properties/count> ?Dwellings_Aberdeenshire.
```

Scenario 2 - the query

```
?d qb:dataSet  <http://statistics.gov.scot/data/dwellings-council-tax>;
        <http://purl.org/linked-data/cube#measureType> <http://statistics.gov.scot/def/measure-properties/count>;
        <http://statistics.gov.scot/def/dimension/councilTaxBand> <http://statistics.gov.scot/def/concept/council-tax-band/total-dwellings>;
        <http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1;
        <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S12000036>;
        <http://statistics.gov.scot/def/measure-properties/count> ?Dwellings_City_of_Edinburgh.

?e qb:dataSet  <http://statistics.gov.scot/data/dwellings-council-tax>;
        <http://purl.org/linked-data/cube#measureType> <http://statistics.gov.scot/def/measure-properties/count>;
        <http://statistics.gov.scot/def/dimension/councilTaxBand> <http://statistics.gov.scot/def/concept/council-tax-band/total-dwellings>;
        <http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1;
        <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S12000046>;
        <http://statistics.gov.scot/def/measure-properties/count> ?Dwellings_Glasgow_City.

}
ORDER BY ASC(?Year)
LIMIT 100
```

But can we find a way to avoid repetitive lines for each geographical area?

Scenario 2 - the use of OPTIONAL (1)

We will try to create the same query with the use of OPTIONAL

```
SELECT ?Year ?Count_of_births ?Dwellings_Scotland ?Dwellings_Aberdeenshire ?Dwellings_City_of_Edinburgh ?Dwellings_Glasgow_City
WHERE {
?a qb:dataSet <http://statistics.gov.scot/data/births>;
    <http://statistics.gov.scot/def/dimension/gender> <http://statistics.gov.scot/def/concept/gender/all>;
     <http://statistics.gov.scot/def/dimension/timePeriod> <http://statistics.gov.scot/def/concept/time-period/calendar-year>;
      <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S92000003>;
  <http://statistics.gov.scot/def/measure-properties/count> ?Count_of_births.
?a <http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1.
  ?dummy1 rdfs:label ?Year.

?b qb:dataSet  <http://statistics.gov.scot/data/dwellings-council-tax>;
        <http://purl.org/linked-data/cube#measureType> <http://statistics.gov.scot/def/measure-properties/count>;
        <http://statistics.gov.scot/def/dimension/councilTaxBand> <http://statistics.gov.scot/def/concept/council-tax-band/total-dwellings>;
        <http://purl.org/linked-data/sdmx/2009/dimension#refPeriod> ?dummy1.

[…]
```

Scenario 2 - the use of OPTIONAL (2)

```
[…]

#And we make seperate OPTIONAL requests for every territory#

    OPTIONAL{?b <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S9200000
    <http://statistics.gov.scot/def/measure-properties/count> ?Dwellings_Scotland. }

     OPTIONAL{?b <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S1200003
    <http://statistics.gov.scot/def/measure-properties/count> ?Dwellings_Aberdeenshire.}

     OPTIONAL{?b <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S1200003
    <http://statistics.gov.scot/def/measure-properties/count> ?Dwellings_City_of_Edinburgh.}

    OPTIONAL{?b <http://purl.org/linked-data/sdmx/2009/dimension#refArea> <http://statistics.gov.scot/id/statistical-geography/S1200004
    <http://statistics.gov.scot/def/measure-properties/count> ?Dwellings_Glasgow_City.}

}
ORDER BY ASC(?Year)
LIMIT 100
```

Though, if we try to make this query in the endpoint we don’t get correct results :(

Scenario 2 - the results

without the use of OPTIONAL

Year	Count_of_births	Dwellings_Scotland	Dwellings_Aberdeenshire	Dwellings_City_of_Edinburgh	Dwellings_Glasgow_City
2003	52432	2348611	99672	219151	287632
2004	53957	2382158	101851	222702	293719
2005	54386	2402785	103270	224700	294650
2006	55690	2424049	104573	226934	296644
2007	57781	2447256	105922	228535	299251
2008	60041	2465998	107142	230903	299388
2009	59046	2479954	108457	232303	298972
2010	58791	2493838	109955	234001	299459

For the course of Information Systems Development

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