Air Pollution in Madrid

Semantic Web
Group 07

Group participants

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Datasets selected

Stations.csv

Column	Type	Comments / Range (Rounded)	Problems
id	number	Unique identifier of the station.	
name	name	Name of the station	
address	name	Address of the station	
lon	number	Longitud of the station, Range: (-3.77, 3.58)	
lat	number	Latitude of the station, Range: (40.35, 40.52)	
elevation	number	Elevation of the station, Range: (590, 730)	

Datasets selected

Yearly data files

Column	Type	Comments / Range (Rounded)	Problems
date	date	Unique identifier of the station.	
BEN	number	Benzene, Range: (0,20)	Blank values
CH4	number	Methane, Range: (1,3.4)	Blank values
CO	number	Carbon Monoxide, Range: (0.1,4.91)	Blank values
EBE	number	Ethylbenzene, Range: (0,39)	Blank values
NMHC	number	Non-methane hydrocarbons, Range: (0,4.41)	Blank values
NO	number	Nitrogen monoxide, Range: (0,980)	Blank values
NO_2	number	Nitrogen dioxide, Range: (0,350)	Blank values
NOx	number	Nitrogen oxides, Range: (0,1800)	Blank values
O_3	number	Ozone, Range: (0,200)	Blank values
PM10	number	Particles <10 µm, Range: (0,310)	Blank values
PM25	number	Particles <25 µm, Range: (0,96)	Blank values
SO_2	number	Sulfur Dioxide, Range: (1,99)	Blank values
TCH	number	Total hydrocarbons(hexane), Range: (0.15,6.68)	Blank values
TOL	number	Toluene, Range: (0,85)	Blank values
station	number	Unique identifier of the station.	

Datasets selected

R1. Data are in one of the selected smart city domains. ✓

R2. Data are available as a CSV file. ✓

R3. Data have an open license so they can be published. ✓

R4. Data can be easily linked with generic real-world entities (e.g., locations). ✓

Naming Strategy

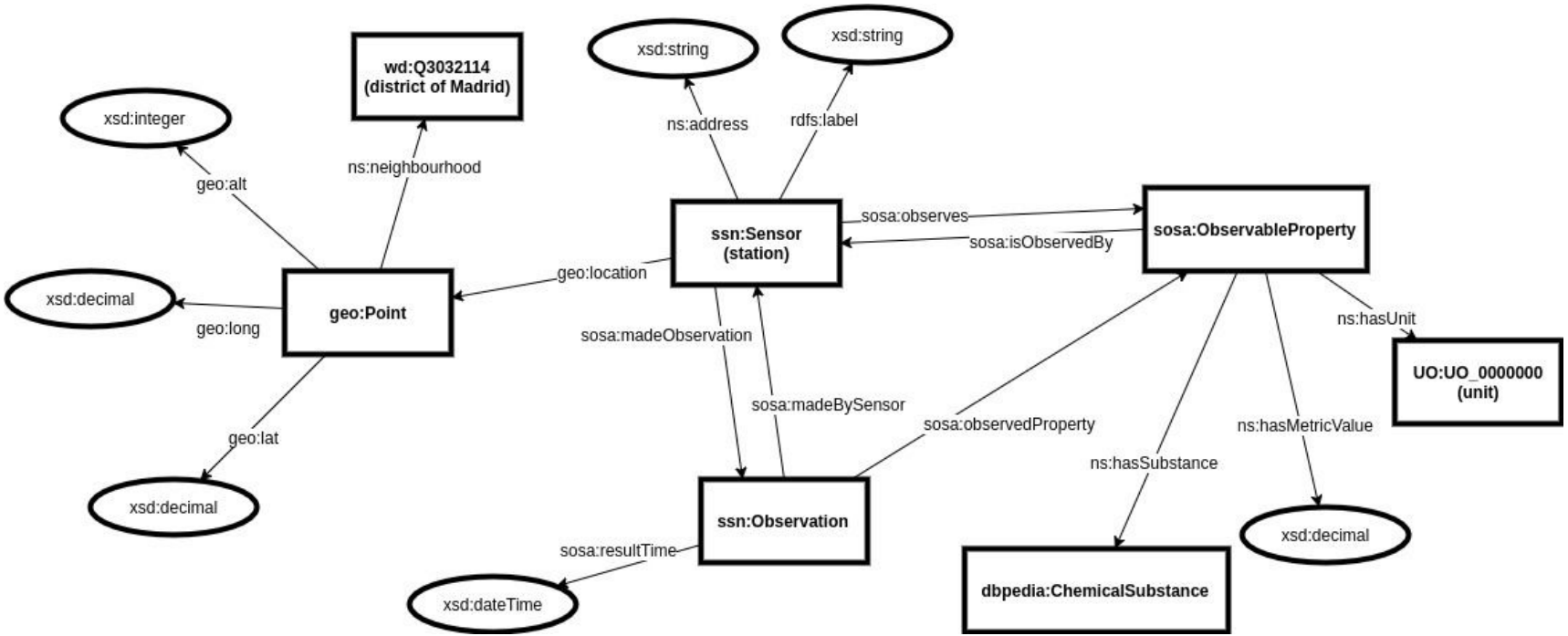
The data to be generated will follow the given patterns:

1. Stations: http://www.group07.linkeddata.org/individual/station#station{id}
2. Measurements: http://www.group07.linkeddata.org/individual/measurement#measurement{id_of_station}
3. Substance Measurements: http://www.group07.linkeddata.org/individual/substanceMeasurement#substanceMeasurement{id_of_station}

CSV to RDF / LODRefine (Filtering and linking)

- Stations
  - Linking neighbourhoods
- Measurements
  - Removal of missing values
  - Transpose for an easier and more straightforward linking

Ontology


wd:Q3032114
(district of Madrid)
xsd:string
xsd:string
xsd:integer
ns:address
rdfs:label
ns:neighbourhood
geo:alt
ssn:Sensor
(station)
sosa:observes
sosa:isObservedBy
sosa:ObservableProperty
xsd:decimal
geo:Point
geo:location
geo:long
sosa:madeObservation
ns:hasUnit
UO:UO_0000000
(unit)
sosa:madeBySensor
sosa:observedProperty
ns:hasMetricValue
geo:lat
ns:hasSubstance
xsd:decimal
ssn:Observation
xsd:decimal
sosa:resultTime
dbpedia:ChemicalSubstance
xsd:dateTime

Final implementation

- Virtuoso as SPARQL endpoint for data
- HTML + JS front end

Demo...

The end.