

Technologies du web sémantique - 2019

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Exercises on SPARQL/Mondial - will be corrected on 9 Oct

The Mondial database contains data about geographic features (mountains, cities, lakes, ...). Use the interactive Web SPARQL query interface at <http://www.semwebtech.org/mondial/sparql> tu answer the following questions:

- what are the cities whose altitude (elevation) is more than 3000 meters?
- what are the cities in France (the country named "France")?
- for each city in France was its population in 2011?
- what are the river that flow through more than one lake?
- for each river what are the lakes it flows into, either directly or indirectly?
- for each river what is the last lake it flows into?
- what are the countries that can be reached from Spain by crossing at least three borders?

The following table shows all the existing triple types in the graph. An empty object type column means that the object is a literal value. Only the last element of each URIs is shown. The complete URI begin with <http://www.semwebtech.org/mondial/10/meta#>. Therefore queries look like

```
prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
prefix : <http://www.semwebtech.org/mondial/10/meta#>
select ?i ?l ?d
where {?i rdf:type :Island; :locatedInWater ?l. ?l rdf:type :Lake; :depth ?d}
```

subject type	property	object type
Archipelago	name	
BelievedBy	percent	
BelievedBy	religionInfo-	Country
BelievedBy	onReligion	Religion
Border	isBorderOf	Country
Border	length	
City	locatedAt	Sea
City	latitude	
City	longitude	
City	hadPopulation	PopulationCount
City	population	
City	name	
City	locatedOnIsland	Island
City	elevation	
City	othername	
City	locatedAt	River
City	locatedAt	Lake
City	localname	
Continent	area	
Continent	name	
Country	independenceDate	
Country	populationGrowth	
Country	isMember	Organization
Country	hasCity	City
Country	hasProvince	Province
Country	gdpServ	
Country	hadPopulation	PopulationCount
Country	gdpTotal	

Country	infantMortality	
Country	carCode	
Country	name	
Country	neighbor	Country
Country	gdpAgri	
Country	inflation	
Country	capital	City
Country	gdplnd	
Country	government	
Country	wasDependentOf	Country
Country	encompassed	Continent
Country	unemployment	
Country	population	
Country	area	
Country	localname	
Country	wasDependentOf	Organization
Country	dependentOf	Country
Country	wasDependentOf	PoliticalBody
Desert	locatedIn	Province
Desert	name	
Desert	longitude	
Desert	locatedIn	Country
Desert	latitude	
Desert	area	
Desert	type	
Encompassed	encompassedBy	Continent
Encompassed	encompassedArea	Country
Encompassed	percent	
Estuary	locatedIn	Province
Estuary	locatedIn	Country
Estuary	elevation	
Estuary	latitude	
Estuary	longitude	
EthnicGroup	name	
EthnicProportion	percent	
EthnicProportion	ethnicInfo-	Country
EthnicProportion	onEthnicGroup	EthnicGroup
Island	locatedInWater	Sea
Island	area	
Island	locatedIn	Province
Island	belongsToArchipelago	Archipelago
Island	locatedIn	Country
Island	elevation	
Island	latitude	
Island	name	
Island	longitude	
Island	type	
Island	locatedInWater	Lake
Island	locatedInWater	River
Lake	type	
Lake	latitude	
Lake	locatedIn	Province
Lake	locatedIn	Country
Lake	flowsInto	River
Lake	longitude	
Lake	depth	
Lake	name	
Lake	area	
Lake	elevation	
Lake	flowsInto	Lake
Lake	locatedOnIsland	Island
Lake	flowsInto	Sea

Language	name	
Membership	inOrganization	Organization
Membership	ofMember	Country
Membership	type	
Mountain	locatedIn	Country
Mountain	latitude	
Mountain	longitude	
Mountain	name	
Mountain	locatedIn	Province
Mountain	inMountains	
Mountain	elevation	
Mountain	locatedOnIsland	Island
Mountain	type	
Mountain	lastEruption	
Mountain	inMountains	Mountain
Organization	established	
Organization	abbrev	
Organization	name	
Organization	hasHeadq	City
PopulationCount	value	
PopulationCount	year	
Province	hasCity	City
Province	hadPopulation	PopulationCount
Province	area	
Province	name	
Province	population	
Province	capital	City
Province	localname	
Province	othername	
Religion	name	
River	locatedIn	Province
River	locatedIn	Country
River	hasEstuary	Estuary
River	hasSource	Source
River	flowsInto	Sea
River	length	
River	flowsThrough	Lake
River	name	
River	area	
River	flowsInto	Lake
River	flowsInto	River
River	locatedOnIsland	Island
Sea	name	
Sea	locatedIn	Country
Sea	mergesWith	Sea
Sea	depth	
Sea	area	
Sea	locatedIn	Province
Source	locatedIn	Province
Source	locatedIn	Country
Source	inMountains	
Source	elevation	
Source	latitude	
Source	longitude	
SpokenBy	percent	
SpokenBy	languageInfo-	Country
SpokenBy	onLanguage	Language
Volcano	locatedIn	Country
Volcano	locatedOnIsland	Island
Volcano	type	
Volcano	elevation	
Volcano	latitude	

Volcano	longitude	
Volcano	name	
Volcano	locatedIn	Province
Volcano	inMountains	
Volcano	lastEruption	

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