

SPARQL

Mikel Egaña Aranguren

mikel-egana-aranguren.github.io

mikel.egana@ehu.eus



SPARQL

<https://github.com/mikel-egana-aranguren/DBA>



SPARQL

SPARQL: SPARQL Protocol and RDF Query Language

[W3C-aren estandar ofiziala:](#)

- RDF grafoetan kontsultak egiteko
- Kontsulta horiek HTTP(S) bidez exekutatu SPARQL endpoint baten kontra (Federatutako kontsultak barne)

SPARQL

SPARQL ezagutza eskatzen duten enpresak: <https://sparql.club/> (Datuak: indeed.com eta monster.com)

Liburuak: <https://www.learningsparql.com/>

SPARQL

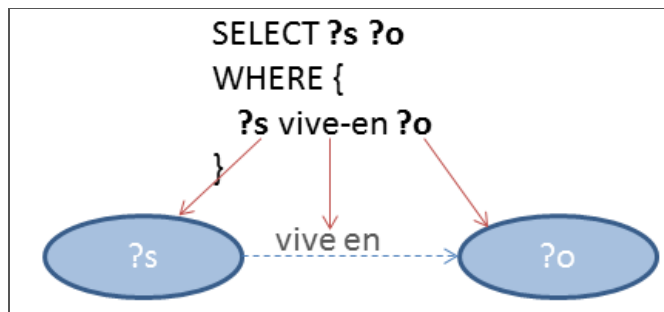
```
SELECT ?s ?o
```

```
WHERE {
```

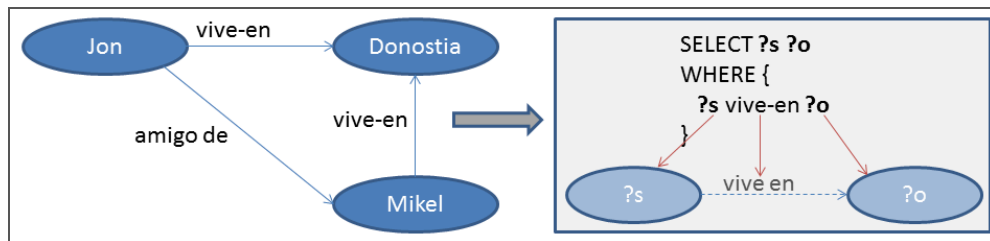
```
    ?s vive_en ?o
```

```
}
```

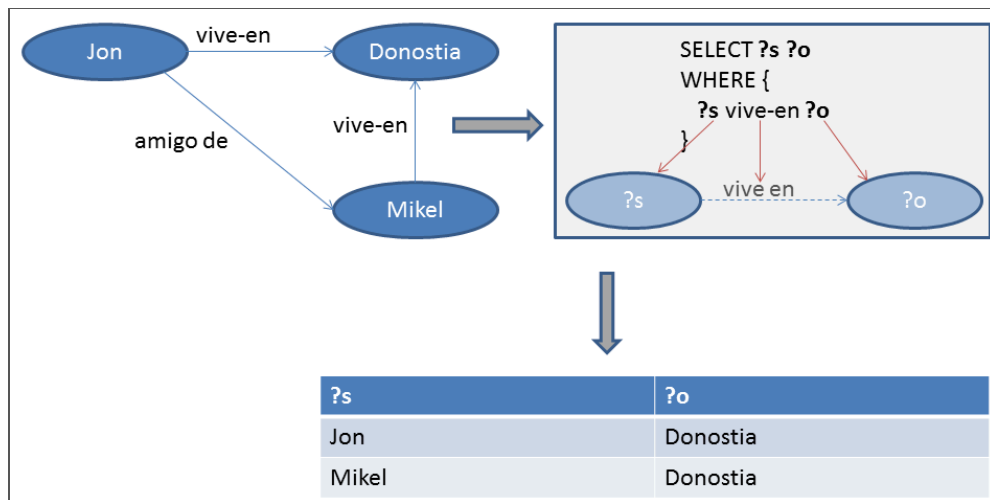
SPARQL



SPARQL



SPARQL



Kontsultaren egitura

(museoak.rdf GraphDB-ra igo) ([1.rq](#))

```
# Prefixes
PREFIX gip_prop: <http://gipuzkoa.eus/prop/>
PREFIX gip: <http://gipuzkoa.eus/resource/>

# Variables que queremos recibir
SELECT ?sujeto ?clase

# Patrón del grafo que queremos extraer del grafo mayor
WHERE {
  ?sujeto gip_prop:bizilekua gip:donostia .
  ?sujeto rdf:type ?clase
}
```

Kontsultaren egitura

([2.rq](#))

```
# Prefixes
PREFIX gip_prop: <http://gipuzkoa.eus/prop/>
PREFIX gip: <http://gipuzkoa.eus/resource/>

# Queremos recibir todas las variables
SELECT *

# Patrón del grafo que queremos extraer del grafo mayor
WHERE {
  ?sujeto gip_prop:bizilekua gip:donostia .
  ?sujeto rdf:type ?clase
}
```

Optional

([3.rq](#))

```
PREFIX gip_prop: <http://gipuzkoa.eus/prop/>
PREFIX gip: <http://gipuzkoa.eus/resource/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>

SELECT ?langile ?bizilekua

WHERE {
  # Tiene que ser una persona
  ?langile rdf:type foaf:person .

  # Tiene que vivir en algun sitio
  ?langile gip_prop:bizilekua ?bizilekua
}
```

Optional

([4.rq](#))

```
PREFIX gip_prop: <http://gipuzkoa.eus/prop/>
PREFIX gip: <http://gipuzkoa.eus/resource/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>

SELECT ?langile ?bizilekua

WHERE {
  # Tiene que ser una persona
  ?langile rdf:type foaf:person .
  # Puede vivir en un sitio o no
  OPTIONAL {
    ?langile gip_prop:bizilekua ?bizilekua
  }
}
```

Union

([5.rq](#))

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?entitatea ?izena

WHERE {
  {?entitatea rdfs:label ?izena }
  UNION
  {?entitatea foaf:name ?izena }
}
```

Emaitzak ordenatu

([6.rq](#))

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?persona ?izena

WHERE {
  ?persona foaf:name ?izena
}

ORDER BY DESC (?izena) # Puede ser DESC o ASC
```

Emaitzak mugatu

([7.rq](#))

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?persona ?izena

WHERE {
  ?persona foaf:name ?izena
}

ORDER BY DESC (?izena)
LIMIT 3
```

Orrialdeak

([8.rq](#))

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?persona ?izena

WHERE {
    ?persona foaf:name ?izena
}

ORDER BY DESC (?izena)
LIMIT 3
OFFSET 3
```


Orrialdeak

([9.rq](#))

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?persona ?izena

WHERE {
    ?persona foaf:name ?izena
}

ORDER BY DESC (?izena)
LIMIT 3
OFFSET 6
```

Emaitzak filtratu

([10.rq](#))

```
PREFIX gip_prop: <http://gipuzkoa.eus/prop/>

SELECT ?museoa ?langile_kop

WHERE {
    ?museoa gip_prop:kopurua ?langile_kop .
    FILTER (?langile_kop > "800"^^xsd:int)
}
```

Emaitzak filtratu

([11.rq](#))

```
SELECT ?langile ?izena

WHERE {
    ?langile foaf:name ?izena .
    FILTER regex(?izena, 'Mi.*')
}
```

Emaitzak filtratu

Logika: !, &&, ||

Kalkuluak: +, -, *, /

Alderapenak: =, !=, >, <

Emaitzak filtratu

SPARQL test-ak: isURI, isBlank, isLiteral, bound

Datuetan sartu: str, lang, datatype

Gehiago: sameTerm, langMatches, regex, ...

Duplikatuak ekidin

([12.rq](#))

```
SELECT ?lantokia
WHERE {
  ?person rdf:type foaf:person .
  ?person <http://vocab.data.gov/def/drm#worksFor> ?lantokia
}
```

```
SELECT DISTINCT ?lantokia
WHERE {
  ?person rdf:type foaf:person .
  ?person <http://vocab.data.gov/def/drm#worksFor> ?lantokia
}
```

Ask

([13.rq](#))

```
PREFIX gov:<http://vocab.data.gov/def/drm#>  
PREFIX gip:<http://gipuzkoa.eus/resource/>
```

ASK

```
WHERE {  
  ?person gov:worksFor gip:gugenheim  
}
```

Describe

DESCRIBE <<http://gipuzkoa.eus/resource/mikel-aranguren>>

CONSTRUCT

([14.rq](#))

```
PREFIX gip_prop:<http://gipuzkoa.eus/prop/>
PREFIX gip:<http://gipuzkoa.eus/resource/>
PREFIX gov:<http://vocab.data.gov/def/drm#>

CONSTRUCT {
    ?langile rdf:type gip:gugenheim_langilea
}
WHERE {
    ?langile gov:worksFor gip:gugenheim
}
```

Delete data

```
DELETE DATA {  
    <http://gipuzkoa.eus/resource/aitor-labajo>  
        rdf:type foaf:person  
}
```

```
DESCRIBE <http://gipuzkoa.eus/resource/aitor-labajo>
```

Delete

```
DELETE {?person rdf:type foaf:person}
WHERE {?person foaf:name ?name}
SELECT * WHERE {
    ?person rdf:type foaf:person
}
```

INSERT DATA

```
PREFIX gip:<http://gipuzkoa.eus/resource/>
```

```
INSERT DATA {
```

```
    gip:aitor-labajo rdf:type gip:hiritar
```

```
}
```

```
DESCRIBE <http://gipuzkoa.eus/resource/aitor-labajo>
```

INSERT

([15.rq](#))

```
PREFIX gip:<http://gipuzkoa.eus/resource/>

INSERT {
  gip:jon-alfaro rdf:type ?type .
}
WHERE {
  gip:aitor-labajo rdf:type ?type .
}
```

DESCRIBE <http://gipuzkoa.eus/resource/jon-alfaro>

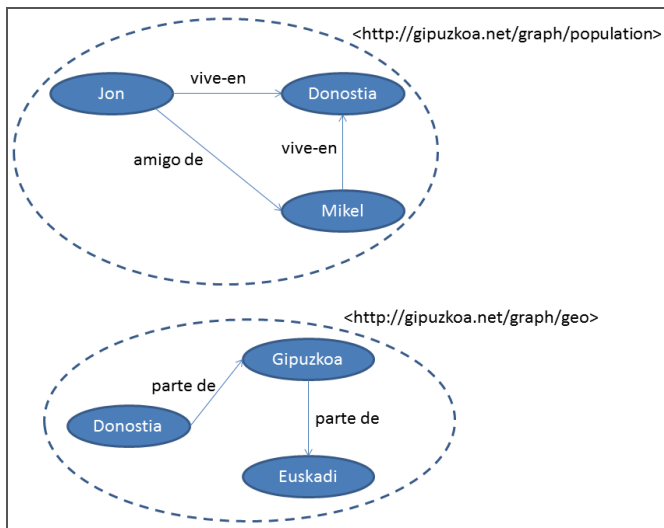
GRAFOAK

Grafoa: tripleen multzoa

Multzo osoa URI batekin identifikatzen da (datuena ez dena)

Triple Store guztiek Default Graph bat dute

GRAFOAK



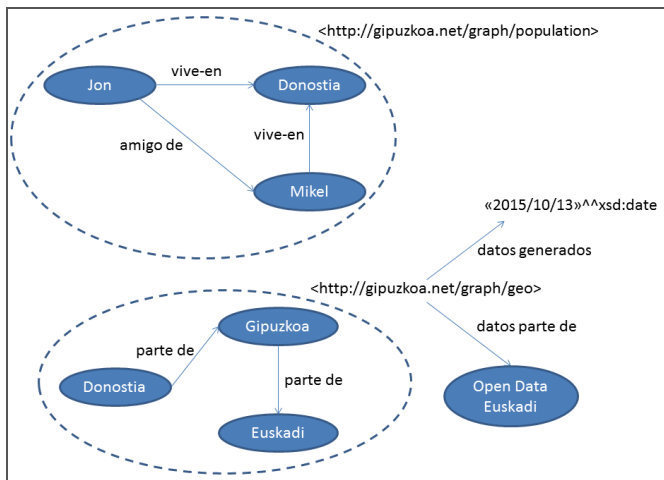
GRAFOAK

GRAFOAK oso baliagarriak dira datuei buruzko datuak gehitzeko

(metadatuak): adib. jatorria, egilea, sorrera data

(beste gauza batzuen artean)

GRAFOAK



GRAFOAK

([17.rq](#))

```
PREFIX dc: <http://purl.org/dc/elements/1.1/>
PREFIX ns: <http://example.org/ns#>

INSERT DATA{
  GRAPH <http://example/bookStore> {
    <http://example/book1> ns:price 42
  }
}
```

GRAFOAK

```
SELECT *  
FROM <http://example/bookStore>  
WHERE {?s ?p ?o}
```

```
SELECT *  
FROM <http://example/bookStore>  
WHERE {?s ?p ?o}
```

Kontsulta federatuak

([16.rq](#))

```
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX gip: <http://gipuzkoa.eus/resource/>

SELECT ?pop
WHERE {
  gip:bilbo owl:sameAs ?town
  SERVICE <https://query.wikidata.org/sparql> {
    ?town <http://www.wikidata.org/prop/direct/P1082> ?pop .
  }
}
```

(bilbo_wikidata.ttl)