

Web Semántica y Linked Data

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- Ismael Ayatz Ortiz
- Pablo Sayans Cobos

- Búsqueda de datasets.
 - Comprobación de licencias.
 - Filtrado de los CSV y realización del Analysis.
 - Realización de la ontología y RNS.
 - Generación de los RDF basándonos en la ontología.
 - Linking de los datos.
 - Realización de la app con Jena y Swing.
-

Objetivo : Realización de app para obtener datos sobre lugares de necesidad.

Elección de dataset

Estaciones de Metro

- https://www.doogal.co.uk/london_stations.php

Paradas de Autobús

- <https://data.london.gov.uk/dataset/tfl-bus-stop-locations-and-routes/resource/673033eb-59a6-4903-84bc-d24495661707>

Líneas de metro

- https://www.doogal.co.uk/london_stations.php
-


Baños públicos


- <https://data.gov.uk/dataset/public-toilets-2014-15/resource/3e9934ac-492a-4042-971c-fe49bd9ca7e7>

Restaurantes

- <http://tour-pedia.org/about/datasets.html>

Comprobamos las licencias de cada DataSet.

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The National Archives
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Es la más restrictiva de las presentes.

Crear proyectos en LODRefine. Analizar y filtrar cada CSV.






26 rows											
Show as: rows records			Show: 5 10 25 50 rows								
All	ExtractDate	OrganisationURI	OrganisationLat	ServiceTypeURI	ServiceTypeLabel	LocationText	CoordinateRefer	GeoX	GeoY	GeoPointLicensingURL	Category
1.	01/10/2014	http://opendatacommunities.org/id/london-borough-council/barnet	Barnet	http://id.esd.org.uk/service/579	Public toilets	Ballards Lane, Finchley Central, London	OSGB36	525239	190735	http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/public-sector/guidance/derived-data-exemptions.html	unisex
2.	01/10/2014	http://opendatacommunities.org/id/london-borough-council/barnet	Barnet	http://id.esd.org.uk/service/579	Public toilets	Bell Lane, Hendon, London	OSGB36	523426	189016	http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/public-sector/guidance/derived-data-exemptions.html	unisex
3.	01/10/2014	http://opendatacommunities.org/id/london-borough-council/barnet	Barnet	http://id.esd.org.uk/service/579	Public toilets	Burnt Oak Library	OSGB36	520357	190939	http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/public-sector/guidance/derived-data-exemptions.html	female and male
4.	01/10/2014	http://opendatacommunities.org/id/london-borough-council/barnet	Barnet	http://id.esd.org.uk/service/579	Public toilets	Cat Hill, East Barnet, Hertfordshire	OSGB36	527200	195407	http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/public-sector/guidance/derived-data-exemptions.html	unisex
5.	01/10/2014	http://opendatacommunities.org/id/london-borough-council/barnet	Barnet	http://id.esd.org.uk/service/579	Public toilets	Chipping Barnet Library	OSGB36	524331	196747	http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/public-sector/guidance/derived-data-exemptions.html	female and male



26 rows

Extensions: DBpedia Crowdsourcing Named-entity recognition Freebase Utilities RDF

Show as: rows records Show: 5 10 25 50 rows « first < previous 1 - 10 next > last »

All	Servicio	Direccion	Coordenada-X	Coordenada-Y	Categoria Acces	Cambiador de B	Baños familiare	Cambiador	Horario de apertura	Administrado por	Email de contacto	Teléfono de con	N
 	1. Public toilets1	Ballards Lane, Finchley Central, London	525239	190735	unisex edit	true	true	true	opening_hours=24/7	jc decaux	highways.correspondence@barnet.gov.uk	2083592000	Situat near Finch Centr Tube Statio
 	2. Public toilets2	Bell Lane, Hendon, London	523426	189016	unisex	true	true	true	opening_hours=24/7	jc decaux	highways.correspondence@barnet.gov.uk	2083592000	Situat at jun with E Stree
 	3. Public	Watling Avenue, Edgware, London	520357	190939	female and male	true	false	false	opening_hours=Mo,Tu,We,Fr,Sa 09:00-17:00; Th	Servest Contract	burnt.oak.library@barnet.gov.uk	2083593880	Librar

Caso especial paradas Metro

640 rows

Show as: rows records Show: 5 10 25 50 rows

All	Station	OS X	OS Y	Latitude	Longitude	Zone	Postcode
1.	Abbey Road	539081	183352	51.5319519867171	0.00372337109717115	3	E15 3NB
2.	Abbey Wood	547297	179002	51.4907840957031	0.20271969782359	4	SE2 9RH
3.	Acton	520296	181196	51.5168869310483	-0.267689952184077	3	W3 0BP
4.	Acton Central	520613	180299	51.5087577801896	-0.263430199363473	2	W3 6BD
5.	Acton Town	519457	179639	51.5030714429635	-0.28030270140601	3	W3 8HN
6.	Addington Village	537082	163744	51.3562385904301	-0.032665100391443	3, 4, 5, 6	CR0 5AR
7.	Addiscombe	534190	166290	51.3798082895941	-0.0732132828267587	3, 4, 5, 6	CR0 7AA
8.	Albany Park	547903	172902	51.4358156062277	0.126444637772442	5	DA5 3HP
9.	Aldgate	533629	181246	51.5143423787415	-0.0756269126501567	1	EC3N 1AH
10.	Aldgate East	533809	181333	51.5150816226404	-0.0730014627258136	1	E1 7PT

Add column based on column Station

New column name:

On error: ☒ set to blank ☐ store error ☐ copy value from original column

Expression: No syntax error.

Preview

row	value	forEach(cell.cross('London TubeLines', 'From Station'), r, r.cells['Tube Line'].value).join(' ')
1.	Abbey Road	DLR Line
2.	Abbey Wood	
3.	Acton	
4.	Acton Central	Overground Line
5.	Acton Town	District Line Piccadilly Line Piccadilly Line
6.	Addington Village	Tramlink Line

OK Cancel

Add column based on column Station

New column name:

On error: ☒ set to blank ☐ store error ☐ copy value from original column

Expression: No syntax error.

Preview

row	value	forEach(cell.cross('London TubeLines', 'From Station'), r, r.cells['To Station'].value).join(' ') + ' ' + forEach(cell.cross('London TubeLines', 'To Station'), r, r.cells['From Station'].value).join(' ')
1.	Abbey Road	West Ham Stratford High Street
2.	Abbey Wood	
3.	Acton	
4.	Acton Central	Willesden Junction South Acton
5.	Acton Town	Ealing Common South Ealing Ealing Common Chiswick Park Turnham Green

OK Cancel

Caso especial paradas Metro

640 rows

Extensions: DBpedia

Show as: rows records Show: 5 10 25 50 rows

All	Station	paradas adyacentes	Lineas	OS X	OS Y	Latitude	Longitude	Zone	Postcode
		1. Abbey Road	West Ham Stratford High Street	539081	183352	51.5319519867171	0.00372337109717115	3	E15 3NB
		2. Abbey Wood		547297	179002	51.4907840957031	0.120271969782359	4	SE2 9RH
		3. Acton		520296	181196	51.5168869310483	-0.267689952184077	3	W3 0BP
		4. Acton Central	Willesden Junction South Acton	520613	180299	51.5087577801896	-0.263430199363473	2	W3 6BD
		5. Acton Town	Ealing Common South Ealing Ealing Common Chiswick Park Turnham Green	519457	179639	51.5030714429635	-0.28030270140601	3	W3 8HN
		6. Addington Village	Fieldway Gravel Hill	537082	163744	51.3562385904301	-0.032665100391443	3,4,5,6	CR0 5AR
		7. Addiscombe	Blackhorse Lane Sandilands	534190	166290	51.3798082895941	-0.0732132828267587	3,4,5,6	CR0 7AA
		8. Albany Park		547903	172902	51.4358156062277	0.126444637772442	5	DA5 3HP
		9. Aldgate	Tower Hill Liverpool Street Liverpool Street	533629	181246	51.5143423787415	-0.0756269126501567	1	EC3N 1AH
		10. Aldgate East	Tower Hill Whitechapel Whitechapel Liverpool Street	533809	181333	51.5150816226404	-0.0730014627258136	1	E1 7PT

Ejemplo resultados Analysis

Baños públicos

- **Nombre del fichero:**public-toilets.csv
- **Descripción:**Baños públicos en la ciudad de Londres
- **Origen de los datos :**[Click aqui](#)
- [Licencia](#)

Columna	Tipo
Servicio	String
Dirección	String
Coordenada X	double
Coordenada Y	double
Catagoria accesible	String
Cambiador de bebe	Boolean
Baños familiares	Boolean
Boolean	String
Horario de apertura	String
Administrado por	String
Email de contacto	String
Teléfono de contacto	int
Notas	String
Código Postal	String

Paradas de autobuses en Londres

- **Nombre del fichero:**London-bus-stops.csv
- **Descripción:**Paradas de bus en la ciudad de Londres
- **Origen de los datos :**[Click aqui](#)
- [Licencia](#)

Columna	Tipo
Nombre	String
Código de parada	int
Coordenada-X	int
Coordenada-Y	int
Sentido	int
Area de parada	String

Restaurantes

- **Nombre del fichero:**london-restaurant.csv
- **Descripción:**Restaurantes en la ciudad de Londres
- **Origen de los datos :**[Click aqui](#)
- [Licencia](#)

id	Tipo
Nombre	String
Dirección	String
Categoría	String
Localización	String
Latitud	double
Longitud	double
detalles	String
Crítica	String

Resource Naming Strategy y Ontología.

Herramientas para su realización :

OWL API 3.5.2

```
public static final IRI ontologyIri = IRI.create("http://www.semanticweb.org/webSemantica/grupo02/vocabulary");
public static OWLDataFactory df = OWLManager.getOWLDataFactory();

public static OWLOntologyManager create() {
    OWLOntologyManager m = OWLManager.createOWLOntologyManager();
    m.addIRIMapper(new AutoIRIMapper(new File("materializedOntologies"), true));
    return m;
}

public static OWLClass crearClase(String nombreClase) {
    return df.getOWLClass(IRI.create(ontologyIri + "#" + nombreClase));
}

public static OWLDeclarationAxiom declararClases(OWLClass clase) {
    return df.getOWLDeclarationAxiom(clase);
}

public static OWLAxiom declararSubClases(OWLClass claseHija, OWLClass clasePadre) {
    return df.getOWLSubClassOfAxiom(claseHija, clasePadre);
}

public static OWLObjectProperty createObjectProperty(String nombrePropiedad) {
    return df.getOWLObjectProperty(IRI.create(ontologyIri + "#" + nombrePropiedad));
}

public static OWLDataProperty createDatatypeProperty(String nombrePropiedad) {
    return df.getOWLDataProperty(IRI.create(ontologyIri + "#" + nombrePropiedad));
}

public static OWLDeclarationAxiom declareProperty(OWLDataProperty propiedad) {
    return df.getOWLDeclarationAxiom(propiedad);
}

public static OWLDeclarationAxiom declareProperty(OWLObjectProperty propiedad) {
    return df.getOWLDeclarationAxiom(propiedad);
}

public static OWLDataPropertyDomainAxiom declareDataDomain(OWLDataProperty propiedad, OWLClass cls){
    return df.getOWLDataPropertyDomainAxiom(propiedad, cls);
}

public static OWLObjectPropertyDomainAxiom declareObjectDomain(OWLObjectProperty propiedad, OWLClass cls){
    return df.getOWLObjectPropertyDomainAxiom(propiedad, cls);
}
```

Resource Naming Strategy y Ontología.

Ontology prefixes:

Prefix	Value
	http://www.semanticweb.org/webSemantica/grupo02/
owl	http://www.w3.org/2002/07/owl#
rdf	http://www.w3.org/1999/02/22-rdf-syntax-ns#
rdfs	http://www.w3.org/2000/01/rdf-schema#
xml	http://www.w3.org/XML/1998/namespace
xsd	http://www.w3.org/2001/XMLSchema#

Resource Naming Strategy.

Class hierarchy: Parada_bus

Annotations: Parada_bus

Description: Parada_bus

Equivalent To

SubClass Of

General class axioms

SubClass Of (Anonymous Ancestor)

Instances

Target for Key

Disjoint With

Classes

Data property hierarchy: tieneCodigoPostal

Annotations: tieneCodigoPostal

Description: tieneCodigoPostal

Characteristics

Functional

Equivalent To

SubProperty Of

Domains (intersection)

Ranges

Disjoint With

Data Property

Object property hierarchy: tieneLinea

Annotations: tieneLinea

Description: tieneLinea

Characteristics

Functional

Inverse function

Transitive

Symmetric

Asymmetric

Reflexive

Irreflexive

Equivalent To

SubProperty Of

Inverse Of

Domains (intersection)

Ranges (intersection)

Disjoint With

Object Property

Generación de los RDF y linkeado de datos con DBpedia

```
4694 lines (4312 sloc) | 275 KB
Raw Blame History

1 @prefix : <> .
2 @prefix ont: <http://www.semanticweb.org/webSemantica/grupo02/vocabulary#> .
3 @prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
4 @prefix owl: <http://www.w3.org/2002/07/owl#> .
5 @prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
6 @prefix foaf: <http://xmlns.com/foaf/0.1/> .
7
8
9 <http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#AbbeyRoad> a ont:Parada_metro ;
10   ont:tieneNombre "Abbey Road" ;
11   ont:tieneParadasAdyacentes "West Ham" ;
12   ont:tieneLinea "DLR Line" ;
13   ont:tieneCoordenada-Y "183352"^^<http://www.w3.org/2001/XMLSchema#int> ;
14   ont:tieneLatitud "51.5319519867171"^^<http://www.w3.org/2001/XMLSchema#double> ;
15   ont:tieneLongitud "0.0037233710971715"^^<http://www.w3.org/2001/XMLSchema#double> ;
16   ont:tieneZona "3"^^<http://www.w3.org/2001/XMLSchema#int> ;
17   ont:tieneCodigoPostal "E15 3NB"^^<http://www.w3.org/2001/XMLSchema#int> ;
18   ont:tieneParadasAdyacentes "Stratford High Street" .
19
20 <http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#ActonCentral> a ont:Parada_metro ;
21   ont:tieneNombre "Acton Central" ;
22   ont:tieneParadasAdyacentes "Willesden Junction" ;
23   ont:tieneLinea "Overground Line" ;
24   ont:tieneCoordenada-Y "180299"^^<http://www.w3.org/2001/XMLSchema#int> ;
25   ont:tieneLatitud "51.5087577801896"^^<http://www.w3.org/2001/XMLSchema#double> ;
26   ont:tieneLongitud "-0.263430199363473"^^<http://www.w3.org/2001/XMLSchema#double> ;
27   ont:tieneZona "2"^^<http://www.w3.org/2001/XMLSchema#int> ;
28   ont:tieneCodigoPostal "W3 6BD"^^<http://www.w3.org/2001/XMLSchema#int> ;
29   ont:tieneParadasAdyacentes "South Acton" .
30
31 <http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#ActonTown> a ont:Parada_metro ;
32   ont:tieneNombre "Acton Town" ;
33   ont:tieneParadasAdyacentes "Ealing Common" ;
34   ont:tieneLinea "District Line" ;
35   owl:sameAs <http://dbpedia.org/resource/District_line> ;
36   ont:tieneCoordenada-Y "179639"^^<http://www.w3.org/2001/XMLSchema#int> ;
37   ont:tieneLatitud "51.5030714429635"^^<http://www.w3.org/2001/XMLSchema#double> ;
38   ont:tieneLongitud "-0.28030270140601"^^<http://www.w3.org/2001/XMLSchema#double> ;
39   ont:tieneZona "3"^^<http://www.w3.org/2001/XMLSchema#int> ;
40   ont:tieneCodigoPostal "W3 8HL"^^<http://www.w3.org/2001/XMLSchema#int> ;
41   ont:tieneParadasAdyacentes "South Ealing" ;
42   ont:tieneLinea "Piccadilly Line" ;
43   owl:sameAs <http://dbpedia.org/resource/Piccadilly_line> ;
44   ont:tieneParadasAdyacentes "Chiswick Park" , "Turnham Green" .
45
```














Generación de los RDF y linkeado de datos con DBpedia

1057 rows

Extensions: D

Show as: rows records

Show: 5 10 25 50 rows

All	Nombre	Paradas Adyace	Linea	schema:linea	Coordenada-X	Coordenada-Y	Latitud	Longitud	Zona	Codigo Postal
 	1. Abbey Road	West Ham	DLR Line new Choose new match	edit	539081	183352	51.5319519867171	0.00372337109717115	3	E15 3NB
 	2. Abbey Road	Stratford High Street								
 	3. Acton Central	Willesden Junction	Overground Line new Choose new match		520613	180299	51.5087577801896	-0.263430199363473	2	W3 6BD
 	4. Acton Central	South Acton								
 	5. Acton Town	Ealing Common	District Line Choose new match	http://dbpedia.org/resource/District_line	519457	179639	51.5030714429635	-0.28030270140601	3	W3 8HN
 	6. Acton Town	South Ealing	Piccadilly Line Choose new match	http://dbpedia.org/resource/Piccadilly_line						
 	7. Acton Town	Ealing Common	Piccadilly Line Choose new match	http://dbpedia.org/resource/Piccadilly_line						
 	8. Acton Town	Chiswick Park								
 	9. Acton Town	Turnham Green								
 	10. Addington Village	Fieldway	Tramlink Line new Choose new match		537082	163744	51.3562385904301	-0.032665100391443	3,4,5,6	CR0 5AR

Generación de los RDF y linkeado de datos con DBpedia

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1 @prefix : <> .
2 @prefix ont: <http://www.semanticweb.org/webSemantica/grupo02/vocabulary#> .
3 @prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
4 @prefix owl: <http://www.w3.org/2002/07/owl#> .
5 @prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
6 @prefix foaf: <http://xmlns.com/foaf/0.1/> .
7
8
9 <http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#Abbey+Road> a ont:Parada_metro ;
10     ont:tieneNombre "Abbey Road" ;
11     ont:tieneParadasAdyacentes "West Ham" ;
12     ont:tieneLinea "DLR Line" ;
13     ont:tieneCoordenada-Y "183352"^^<http://www.w3.org/2001/XMLSchema#int> ;
14     ont:tieneLatitud "51.5319519867171"^^<http://www.w3.org/2001/XMLSchema#double> ;
15     ont:tieneLongitud "0.00372337109717115"^^<http://www.w3.org/2001/XMLSchema#double> ;
16     ont:tieneZona "3"^^<http://www.w3.org/2001/XMLSchema#int> ;
17     ont:tieneCodigoPostal "E15 3NB"^^<http://www.w3.org/2001/XMLSchema#int> ;
18     ont:tieneParadasAdyacentes "Stratford High Street" .
19
20 <http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#Acton+Central> a ont:Parada_metro ;
21     ont:tieneNombre "Acton Central" ;
22     ont:tieneParadasAdyacentes "Willesden Junction" ;
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25     ont:tieneLatitud "51.5087577801896"^^<http://www.w3.org/2001/XMLSchema#double> ;
26     ont:tieneLongitud "-0.263430199363473"^^<http://www.w3.org/2001/XMLSchema#double> ;
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33     ont:tieneParadasAdyacentes "Ealing Common" ;
34     ont:tieneLinea "District Line" ;
35     owl:sameAs <http://dbpedia.org/resource/District_line> ;
36     ont:tieneCoordenada-Y "175035"^^<http://www.w3.org/2001/XMLSchema#int> ;
37     ont:tieneLatitud "51.5030714429635"^^<http://www.w3.org/2001/XMLSchema#double> ;
38     ont:tieneLongitud "-0.28030270140601"^^<http://www.w3.org/2001/XMLSchema#double> ;
39     ont:tieneZona "3"^^<http://www.w3.org/2001/XMLSchema#int> ;
40     ont:tieneCodigoPostal "W3 8HW"^^<http://www.w3.org/2001/XMLSchema#int> ;
41     ont:tieneParadasAdyacentes "South Ealing" ;
42     ont:tieneLinea "Piccadilly Line" ;
43     owl:sameAs <http://dbpedia.org/resource/Piccadilly_line> ;
44     ont:tieneParadasAdyacentes "Chiswick Park", "Turnham Green" .
45
46 <http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#Addington+Village> a ont:Parada_metro ;
47     ont:tieneNombre "Addington Village" ;
48     ont:tieneParadasAdyacentes "Fieldway" ;
```

APP

