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-59a6-4
903-84bc-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-fe49bd9c a7e7

Restaurantes

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

Comprobamos las licencias de cada DataSet.





Back to The National Archives

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Domain of Application: Content, Data

Overview

https://creativecommons.org/publicdomain/zero/1.0/

Full text

https://creativecommons.org/publicdomain/zero/1.0/legalcode

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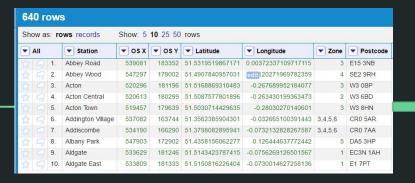
Es la más restrictiva de las presentes.

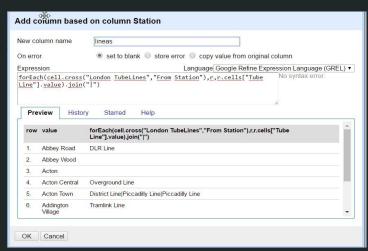
Crear proyectos en LODRefine. Analizar y filtrar cada CSV.

26	26 rows												
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☆	E)	1.	01/10/2014	http://opendatacommunities.org/id/lond@ditborough-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



Caso especial paradas Metro





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row	value	forEach(cell.cross("London TubeLines","From Station"),r.r.cells["T6" ") + " " + forEach(cell.cross("London TubeLines", "T6 Station"),r.r Station"],value),join[" " " West Ham Statford High Street	
	value	forEach(cell.cross("London TubeLines","From Station"),r,r.cells["To ") + " " + forEach(cell.cross("London TubeLines","To Station"),r,r Station"],value).join(" ")	
1.	Abbey Road	forEach(cell.cross("London TubeLines","From Station"),r.r.cells["Tc" ") + " " + forEach(cell.cross("London TubeLines", "To Station"),r.r Station", value),join(" ") West Ham Stratford High Street	
1.	Abbey Road Abbey Wood	forEach(cell.cross("London TubeLines","From Station"),r.r.cells["Tc" ") + " " + forEach(cell.cross("London TubeLines", "To Station"),r.r Station", value),join(" ") West Ham Stratford High Street	

Caso especial paradas Metro

640 rows										Extensio	ns: DBpedia
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\$	G	1.	Abbey Road	Mestinani, orangi oraci	DETERMO	539081	183352	51.5319519867171	0.00372337109717115	3	E15 3NB
		2.	Abbey Wood	I		547297	179002	51.4907840957031	0.120271969782359	4	SE2 9RH
		3.	Acton	I		520296	181196	51.5168869310483	-0.267689952184077	3	W3 0BP
		4.	Acton Central	Willesden Junction South Acton	Overground Line	520613	180299	51.5087577801896	-0.263430199363473	2	W3 6BD
		5.	Acton Town	Ealing Common South Ealing Ealing Common Chiswick Park Turnham Green	District Line Piccadilly Line Piccadilly Line	519457	179639	51.5030714429635	-0.28030270140601	3	W3 8HN
		6.	Addington Village	Fieldway Gravel Hill	Tramlink Line	537082	163744	51.3562385904301	-0.032665100391443	3,4,5,6	CR0 5AR
		7.	Addiscombe	Blackhorse Lane Sandilands	Tramlink Line	534190	166290	51.3798082895941	-0.0732132828267587	3,4,5,6	CR0 7AA
		8.	Albany Park	T		547903	172902	51.4358156062277	0.126444637772442	. 5	DA5 3HP
		9.	Aldgate	Tower Hill Liverpool Street Liverpool Street	Circle Line Metropolitan Line	533629	181246	51.5143423787415	-0.0756269126501567	4	EC3N 1AH
		10.	Aldgate East	Tower Hill Whitechapel Whitechapel Liverpool Street	District Line Hammersmith and City Line	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
Catagoría 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
- Ofrigen de los datos :Click aqui
- Licence

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

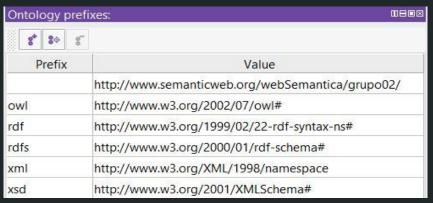
Resource Naming Strategy y Ontología.

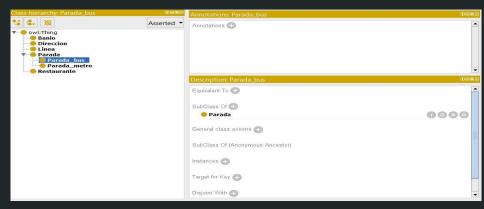
Herramientas para su realización :

OWL API 3.5.2

```
public static final IRI ontologyiri = IRI.create("http://www.semanticweb.org/webSemantica/grupo02/vocabulary");
public static OWLDataFactory df = OWLManager.aetOWLDataFactory();
public static OWLOntologyManager create() {
    OWLOntologyManager m = OWLManager.createOWLOntologyManager();
   m.addIRIMapper(new AutoIRIMapper(new File("materializedOntologies"), true));
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 property, OWLClass cls){
    return df.getOWLDataPropertyDomainAxiom(property, cls);
public static OWLObjectPropertyDomainAxiom declareObjectDomain(OWLObjectProperty property, OWLClass cls){
    return df.getOWLObjectPropertyDomainAxiom(property, cls);
```

Resource Naming Strategy y Ontología.





Resource Naming Strategy.

Functional

Equivalent To

Banio

Parada_metro

xsd:string

Disjoint With

owl:topDataProperty

- administradoPor

■ tioneAreaParada

= tieneCoordenada-

tieneLocalizacion

= tieneLongitud

= tieneNombre

= tieneServicio

= tioneZona

= tieneNotas

= tioneEmailDeContacto

tieneHoraDeApertura
tieneLatitud

tieneParadasAdyacentes
tieneSentido

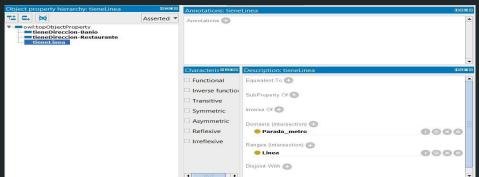
tieneTelefonoDeContacto

tieneCritica

tieneBaniosFamiliares
tieneCambiador
tieneCambiadorDeBebe
tieneCategoria
tieneCategoriaAccesible
tieneCodigoDeParada
tieneCodigoPostal
tieneCodreada-X



Clases



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: <a href="http://www.w3.org/2000/01/rdf-schema">http://www.w3.org/2000/01/rdf-schema#>.
     6 @prefix foaf: <a href="http://xmlns.com/foaf/0.1/">http://xmlns.com/foaf/0.1/> .
         <a href="http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada metro#Abbev+Road">http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada metro#Abbev+Road</a> a ont:Parada metro;
                   ont:tieneNombre "Abbey Road";
                   ont:tieneParadasAdyacentes "West Ham";
                   ont:tieneLinea "DLR Line" ;
                   ont:tieneCoordenada-Y "183352"^^<http://www.w3.org/2001/XMLSchema#int>;
                   ont:tieneLatitud "51.5319519867171"^^<a href="http://www.w3.org/2001/XMLSchema#double">http://www.w3.org/2001/XMLSchema#double</a>;
                   ont:tieneLongitud "0.00372337109717115"^^<a href="http://www.w3.org/2001/XMLSchema#double">http://www.w3.org/2001/XMLSchema#double</a>;
                   ont:tieneZona "3"^^<http://www.w3.org/2001/XMLSchema#int>;
                   ont:tieneCodigoPostal "E15 3NB"^^<http://www.w3.org/2001/XMLSchema#int> ;
                   ont:tieneParadasAdyacentes "Stratford High Street" .
   20 <a href="http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada metro#Acton+Central">http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada metro#Acton+Central</a> a ont:Parada metro;
                   ont:tieneNombre "Acton Central" :
                   ont:tieneParadasAdvacentes "Willesden Junction" ;
                   ont:tieneLinea "Overground Line";
                   ont:tieneCoordenada-Y "180299"^^<http://www.w3.org/2001/XMLSchema#int>;
                   ont:tieneLatitud "51.5087577801896"^^<http://www.w3.org/2001/XMLSchema#double>;
                   ont:tieneZona "2"^^<http://www.w3.org/2001/XMLSchema#int>;
                   ont:tieneCodigoPostal "W3 6BD"^^<http://www.w3.org/2001/XMLSchema#int>;
                   ont:tieneParadasAdvacentes "South Acton" .
   31 <a href="http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#Acton+Town">http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#Acton+Town</a> a ont:Parada_metro;
                    ont:tieneNombre "Acton Town" ;
                   ont:tieneParadasAdyacentes "Ealing Common";
                   ont:tieneLinea "District Line";
                   owl:sameAs <a href="http://dbpedia.org/resource/District line">http://dbpedia.org/resource/District line</a>;
                   ont:tieneCoordenada-Y "179639"^^<a href="http://www.w3.org/2001/XMLSchema#int">http://www.w3.org/2001/XMLSchema#int</a>;
                   ont:tieneLatitud "51.5030714429635"^^<a href="http://www.w3.org/2001/XMLSchema#double">http://www.w3.org/2001/XMLSchema#double</a>;
                   ont:tieneLongitud "-0.28030270140601"^^<a href="http://www.w3.org/2001/XMLSchema#double">http://www.w3.org/2001/XMLSchema#double</a>;
                   ont:tieneZona "3"^^<http://www.w3.org/2001/XMLSchema#int>;
                   ont:tieneCodigoPostal "W3 8HN"^^<http://www.w3.org/2001/XMLSchema#int>;
                   ont:tieneParadasAdyacentes "South Ealing";
                   ont:tieneLinea "Piccadilly Line";
                   owl:sameAs <a href="http://dbpedia.org/resource/Piccadilly line">http://dbpedia.org/resource/Piccadilly line</a>;
                   ont:tieneParadasAdvacentes "Chiswick Park" , "Turnham Green" ,
```

Generación de los RDF y linkeado de datos con DBpedia

10	1057 rows Extensions:												
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▼ AII		Nombre		Paradas Adyace	Linea	schema:linea	▼ Coordenada-X	▼ Coordenada-Y	Latitud	Longitud	Zona	Codigo Postal	
忿	S	1.	Abbey Road	West Ham	DLR Line new Choose new match	edit	539081	183352	51.5319519867171	0.00372337109717115	3	E15 3NB	
公	EJ.	2.	Abbey Road	Stratford High Street		W							
盘		3.	Acton Central	Willesden Junction	Overground Line new Choose new match		520613	180299	51.5087577801896	-0.263430199363473	2	W3 6BD	
₩	E)	4.	Acton Central	South Acton									
益		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	
垃	57	6.	Acton Town	South Ealing	Piccadilly Line Choose new match	http://dbpedia.org/resource/Piccadilly_line							
źż		7.	Acton Town	Ealing Common	Piccadilly Line Choose new match	http://dbpedia.org/resource/Piccadilly_line							
级	Q	8.	Acton Town	Chiswick Park									
23		9.	Acton Town	Turnham Green									
ঠ	9	10.	Addington Village	Fieldway	Tramlink Line new		537082	163744	51.3562385904301	-0.032665100391443	3,4,5,6	CR0 5AR	

Generación de los RDF y linkeado de datos con DBpedia

```
4694 lines (4312 sloc) 275 KB
   1 @prefix : <> .
   @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#> .
       @prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
        @prefix foaf: <http://xmlns.com/foaf/0.1/> .
   9 <a href="http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#Abbey+Road">http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#Abbey+Road</a> a ont:Parada_metro ;
                 ont:tieneNombre "Abbey Road" ;
                 ont:tieneParadasAdyacentes "West Ham";
                 ont:tieneLinea "DLR Line" ;
                 ont:tieneCoordenada-Y "183352"^^<http://www.w3.org/2001/XMLSchema#int>;
                 ont:tieneLatitud "51.5319519867171"^^<http://www.w3.org/2001/XMLSchema#double>;
                 ont:tieneLongitud "0.00372337109717115"^^<http://www.w3.org/2001/XMLSchema#double>;
                 ont:tieneZona "3"^^<http://www.w3.org/2001/XMLSchema#int>;
                 ont:tieneCodigoPostal "E15 3NB"^^<http://www.w3.org/2001/XMLSchema#int>;
                 ont:tieneParadasAdyacentes "Stratford High Street" .
  20 <a href="http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada metro#Acton+Central">http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada metro#Acton+Central</a> a ont:Parada metro
                 ont:tieneNombre "Acton Central";
                 ont:tieneParadasAdyacentes "Willesden Junction" ;
                 ont:tieneLinea "Overground Line" ;
                 ont:tieneCoordenada-Y "180299"^^<http://www.w3.org/2001/XMLSchema#int>;
                 ont:tieneLatitud "51.5087577801896"^^<http://www.w3.org/2001/XMLSchema#double>;
                 ont:tieneLongitud "-0.263430199363473"^^<a href="http://www.w3.org/2001/XMLSchema#double">http://www.w3.org/2001/XMLSchema#double</a>
                 ont:tieneZona "2"^^<http://www.w3.org/2001/XMLSchema#int>;
                 ont:tieneCodigoPostal "W3 6BD"^^<http://www.w3.org/2001/XMLSchema#int>;
                 ont:tieneParadasAdyacentes "South Acton" .
  31 <a href="http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada metro#Acton+Town">http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada metro#Acton+Town</a> a ont:Parada metro;
                 ont:tieneNombre "Acton Town";
                  ont:tieneParadasAdvacentes "Ealing Common" :
                 ont:tieneLinea "District Line" ;
                 owl:sameAs <a href="http://dbpedia.org/resource/District line">http://dbpedia.org/resource/District line</a>;
                 ont:tieneLatitud "51.5030714429635"^^<http://www.w3.org/2001/XMLSchema#double> :
                 ont:tieneLongitud "-0.28030270140601"^^<http://www.w3.org/2001/XMLSchema#double> ;
                 ont:tieneZona "3"^^<http://www.w3.org/2001/XMLSchema#int> :
                 ont:tieneCodigoPostal "W3 8HN"^^<http://www.w3.org/2001/XMLSchema#int>;
                 ont:tieneParadasAdyacentes "South Ealing";
                 ont:tieneLinea "Piccadilly Line" ;
                 owl:sameAs <a href="http://dbpedia.org/resource/Piccadilly line">http://dbpedia.org/resource/Piccadilly line</a>
                  ont:tieneParadasAdyacentes "Chiswick Park" , "Turnham Green"
  46 <a href="http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#Addington+Village">http://www.semanticweb.org/webSemantica/grupo02/resource/Parada/Parada_metro#Addington+Village</a> a ont:Parada_metro;
                 ont:tieneNombre "Addington Village" ;
                 ont:tieneParadasAdyacentes "Fieldway" ;
```

APP

