

# OWL

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# OWL

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



# OWL

OWL: Web Ontology Language

[W3C-ren estandar ofiziala](#) web-ean ontologiak sortzeko, semantika zehatz eta formal batekin

[Web Semantikoa](#) garatzeko ekimenaren parte gisa sortu zen

# OWL

Logika Deskriptiboan (DL) oinarritzen da

Ezagutza-arlo baten adierazpen konputazionala:

- Arrazonamendu automatikoa: "berria" (\*) den ezagutza ondorioztatu, kontsultak, koherentzia, ontologiaren arabera entitateak sailkatu, ...
- Informazio sakabanatua integratu

# RDF/XML sintaxia

```
<owl:Class rdf:about="#arm">  
  <rdfs:subClassOf>  
    <owl:Restriction>  
      <owl:onProperty rdf:resource="#part_of"/>  
      <owl:someValuesFrom rdf:resource="#body"/>  
    </owl:Restriction>  
  </rdfs:subClassOf>  
</owl:Class>
```

# Manchester OWL Syntax sintaxia

Manchester OWL Syntax: `arm` subClassOf `art_of` some `body`

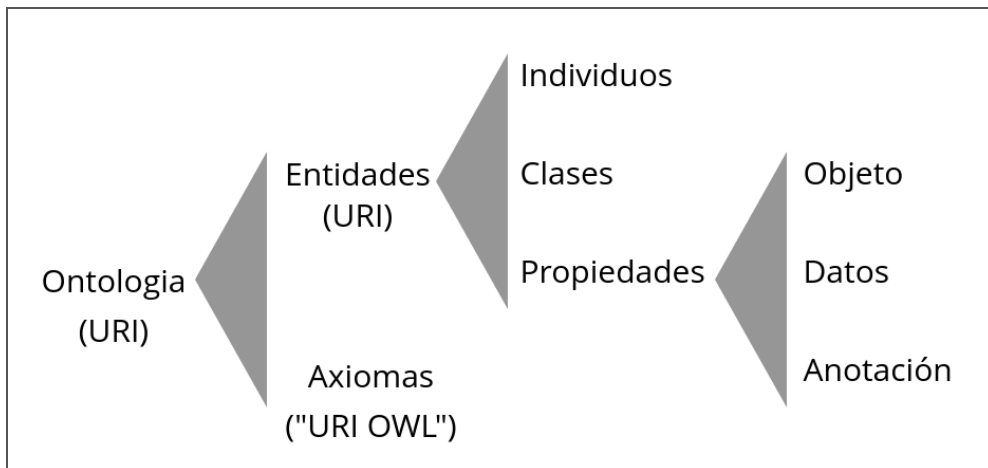
# OWL semantika

Entitateak: ezagutza-arloko entitateak, URlekin identifikatuta, garatzaileak sartutakoak ("Mikel", "parte\_hartzen\_du", ...)

Axiomak: entitateak logika-hiztegiaren bidez lotzen dituzte, OWLek eskaintzen duena (OWL Namespace)

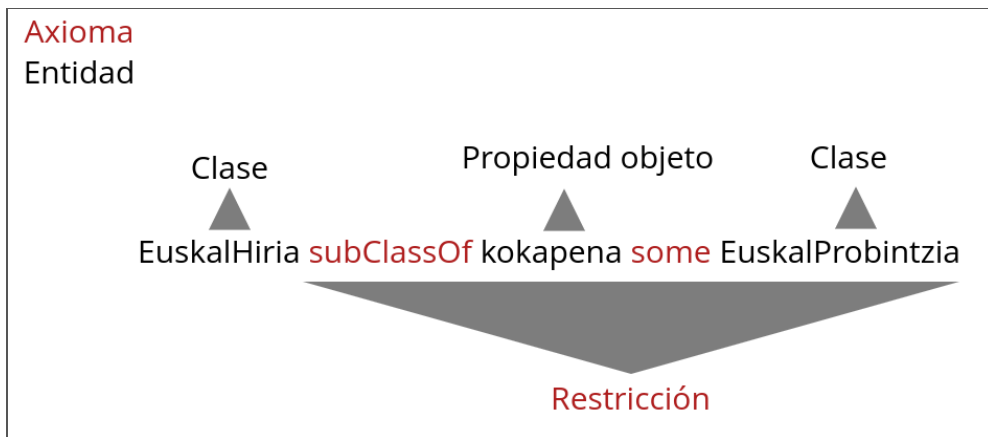
Ontologia batek beste bat inportatu dezake (owl:import) eta bere entitateei erreferentzia egin axiomak erabiliz

# OWL semántica

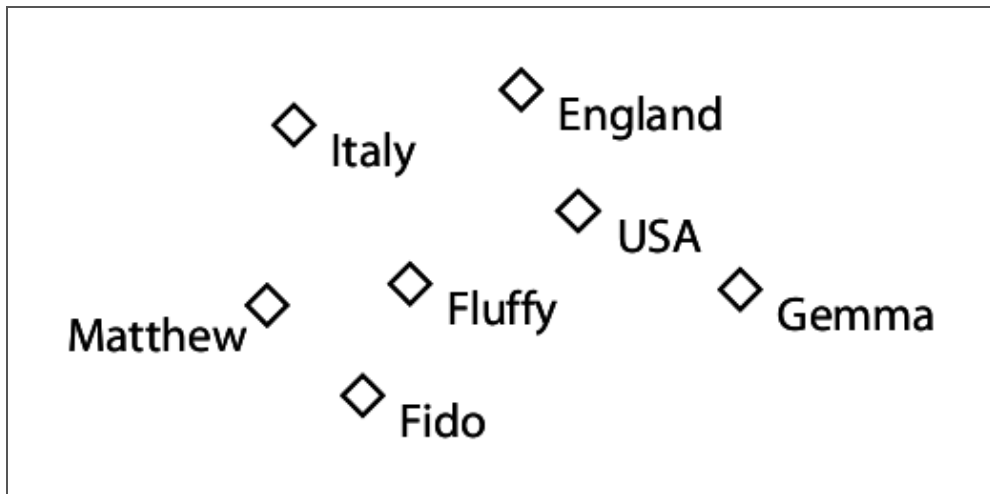




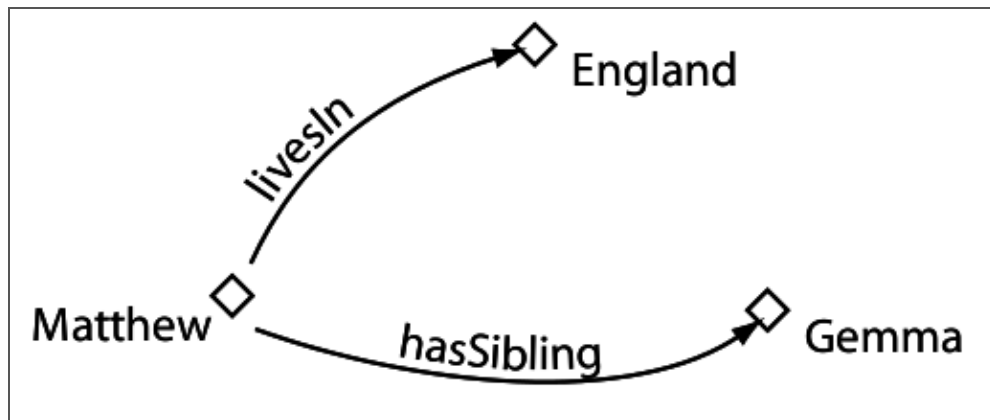
# OWL semantika



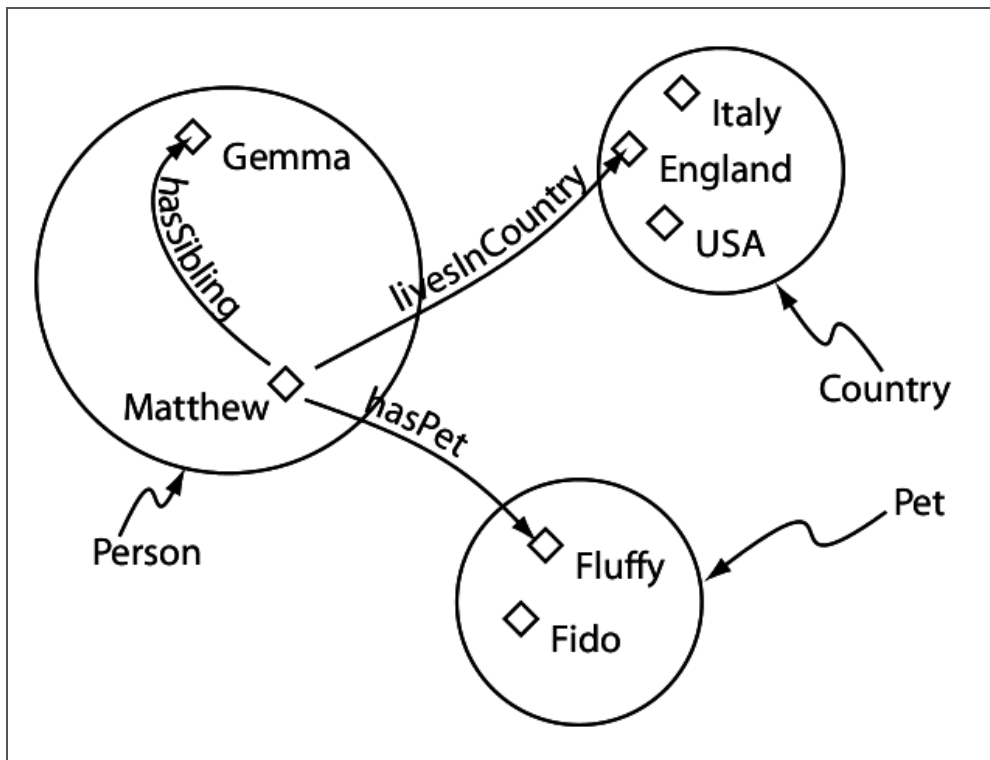
# Banakoak



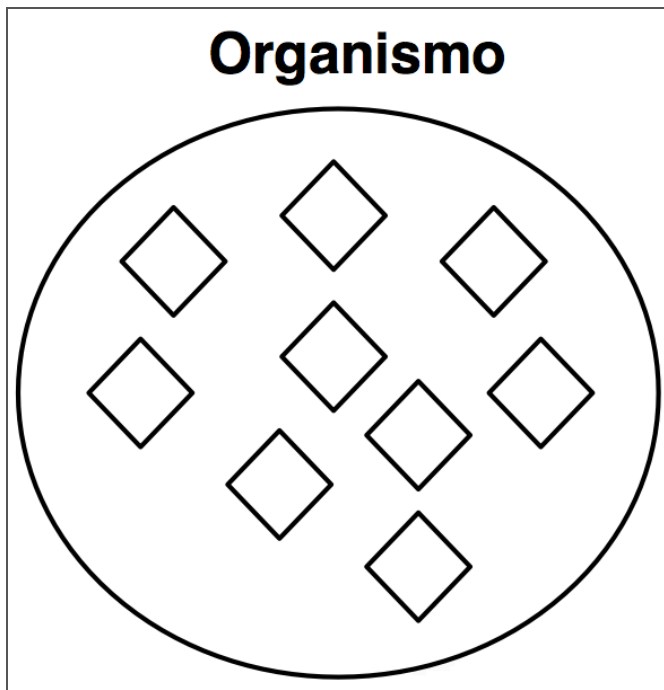
# Propietateak



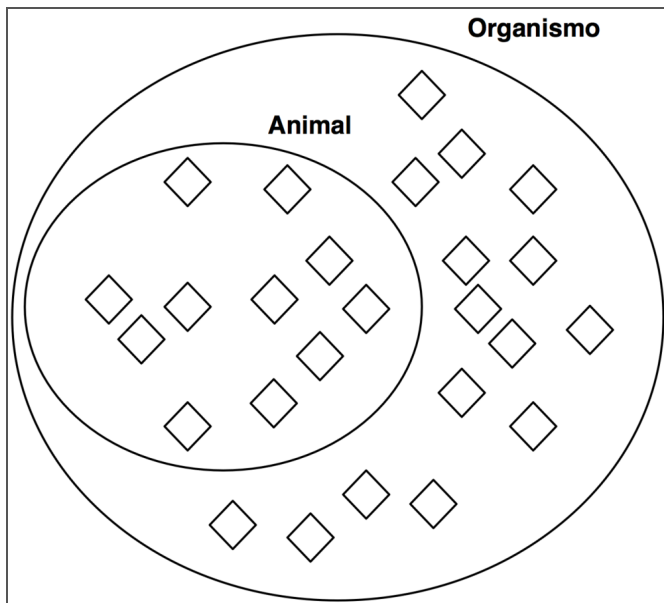
# Klaseak



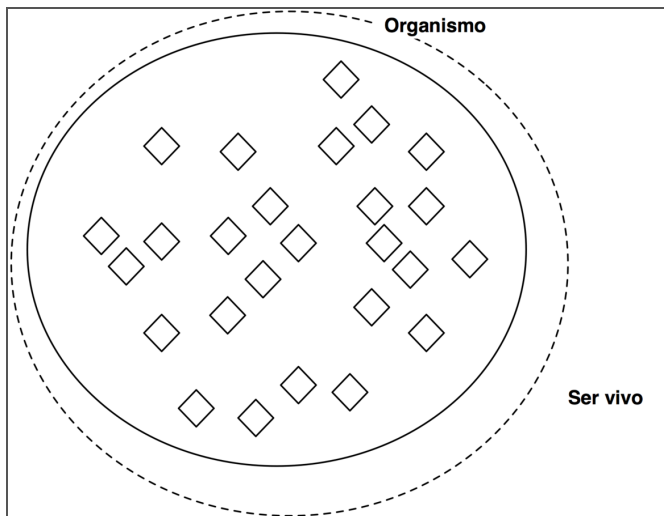
# Klaseak



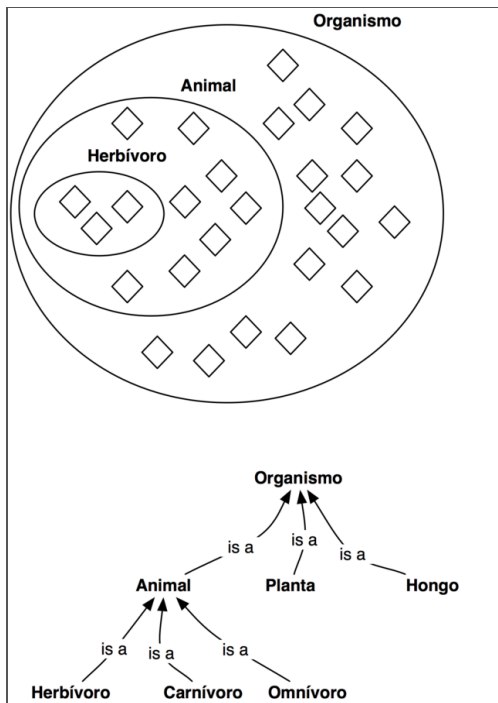
# Klasea azpiklase



# Klase baliokideak

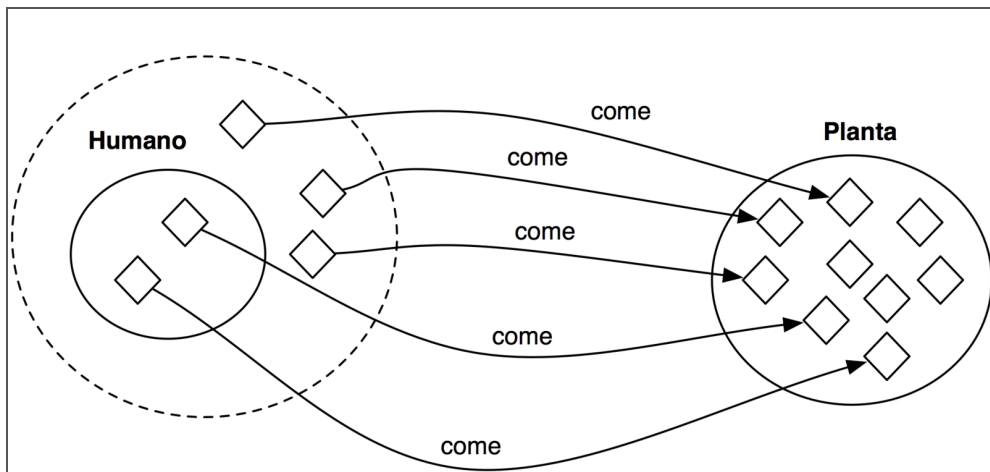


# Klaseen hierarkia (Taxonomia)

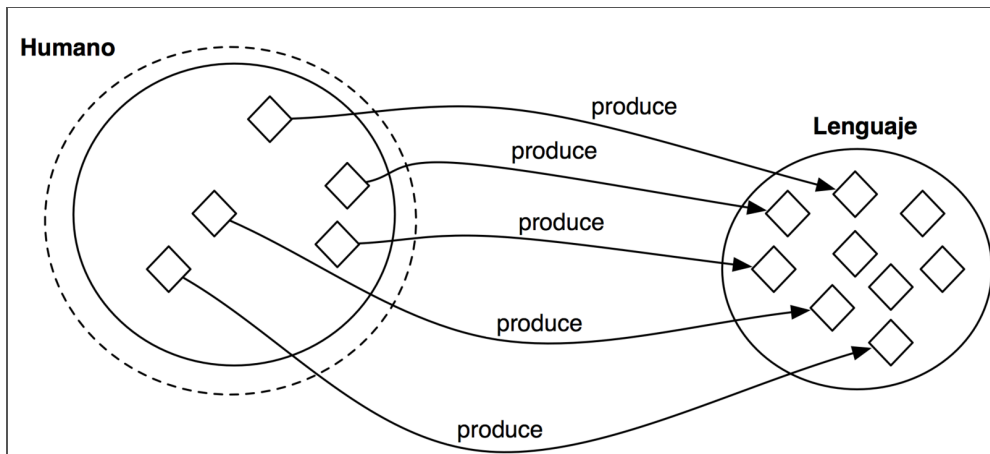




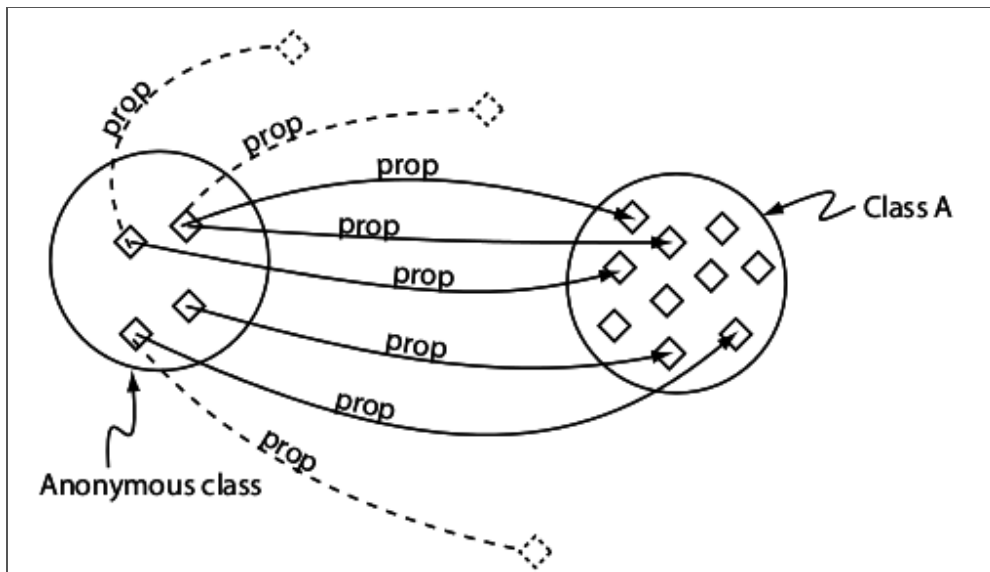
# Beharrezko baldintzak



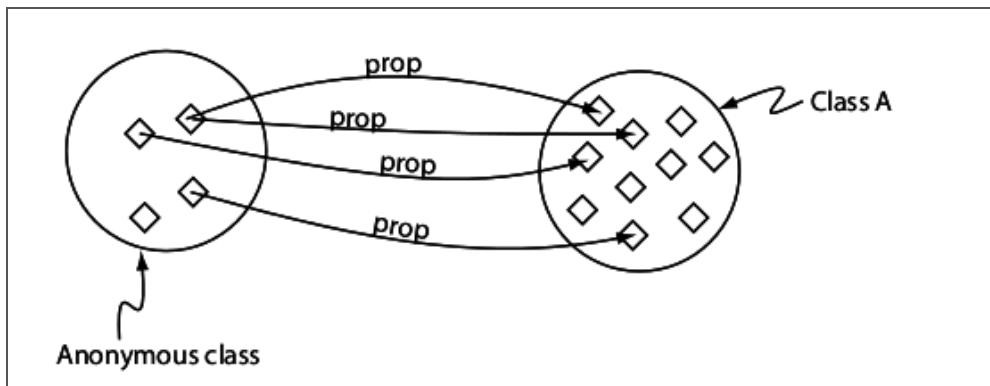
# Beharrezkoak eta nahikoak diren baldintzak



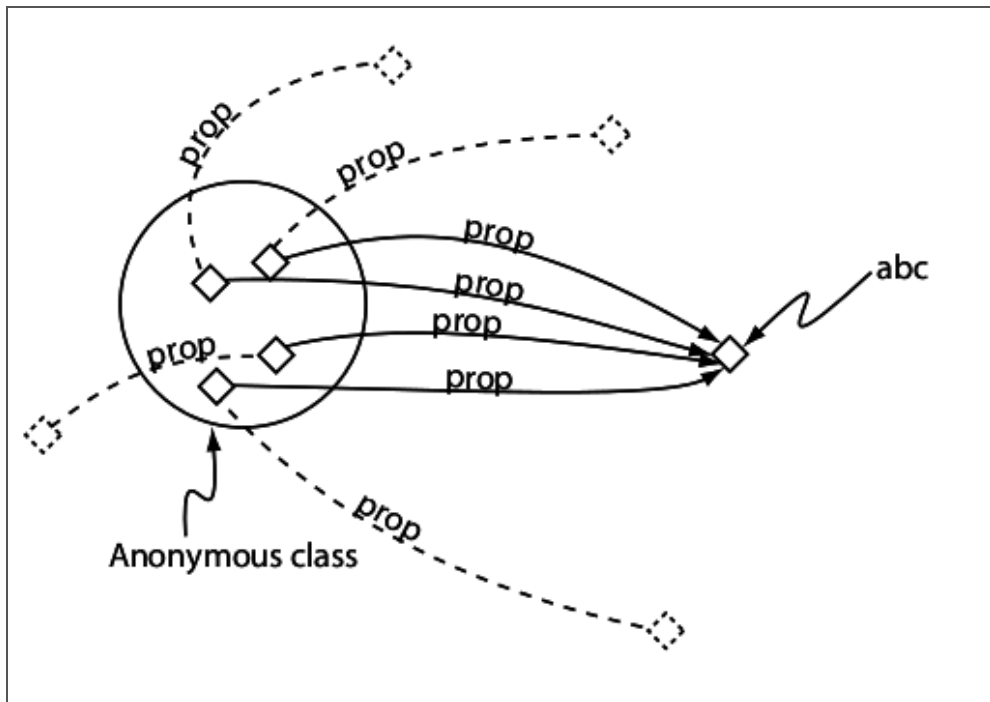
# Murritzeta existentziala



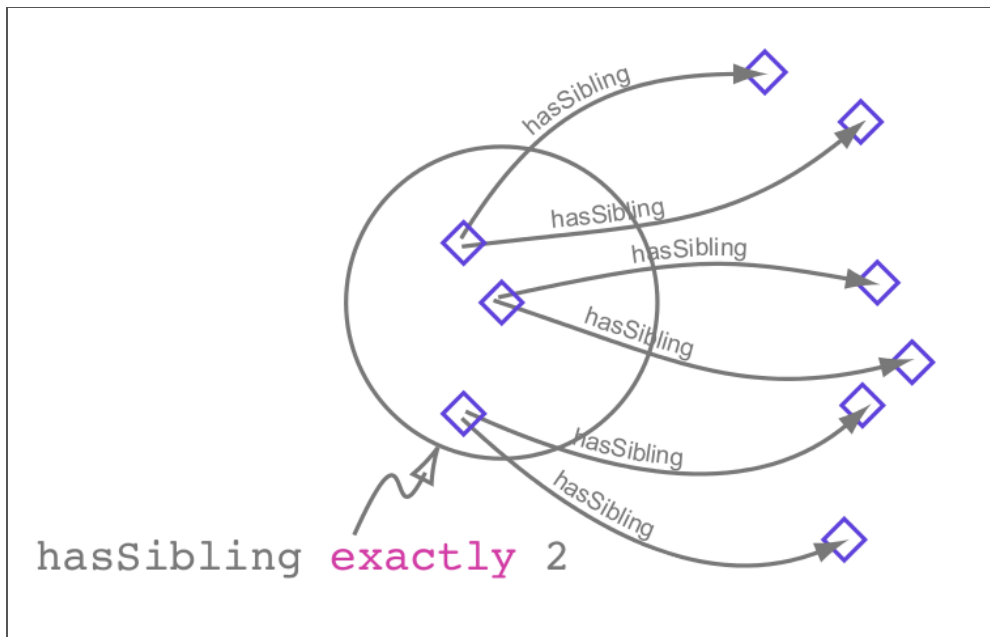
# Murrizketa unibertsala



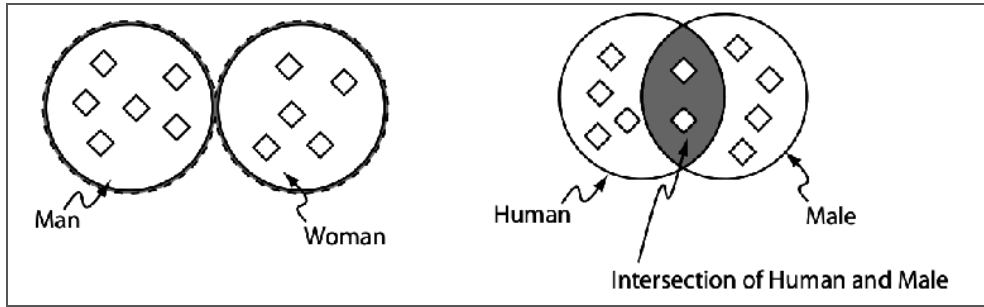
# Banako bateko murrizketa (value)



# Murritzeta kardinalak



# disjointFrom, not, or, and



# Adierazpen konplexuak

The screenshot displays a web-based interface for viewing Gene Ontology (GO) terms. On the left, a 'Class hierarchy' panel shows a tree structure starting from 'Thing' and descending through various GO IDs to the selected term, 'Hypothesis\_MYB\_AP1\_UP'. The right panel shows the 'Annotations' and 'Usage' tabs, with the 'Description' tab active. The description for 'Hypothesis\_MYB\_AP1\_UP' is displayed, showing its equivalent classes and logical definitions.

**Class hierarchy:** Hypothesis\_MYB\_AP1\_UP

**Annotations:** Hypothesis\_MYB\_AP1\_UP

**Description:** Hypothesis\_MYB\_AP1\_UP

Equivalent classes:

- transcription\_factor exactly 1 (PRO\_000009232 and (located\_in\_cellular\_component some ((ECO\_0000033 and GO\_0005654) or (GO\_0000790 and (evidence\_code some ECO\_0000203))))))
- target\_gene exactly 1 (PRO\_000010799 and (participates\_in some (MI\_0931 and (detected\_by some MI\_0438) and (has\_participant only PRO\_000009232))))
- hypothesis\_entity only (PRO\_000009232 or PRO\_000010799)
- regulation some UP

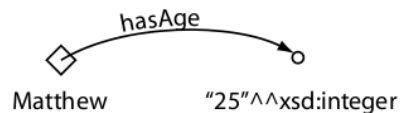


# Propietateak

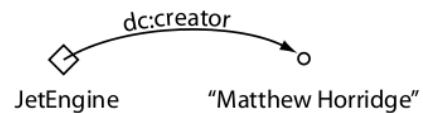
Propiedades objeto



Propiedades datos

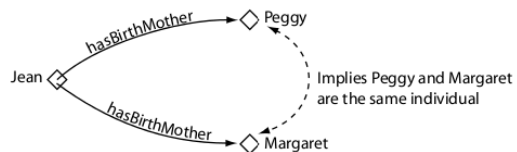


Propiedades anotacion

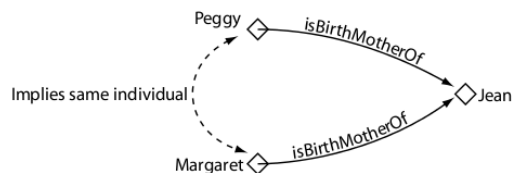


# Proprietateak

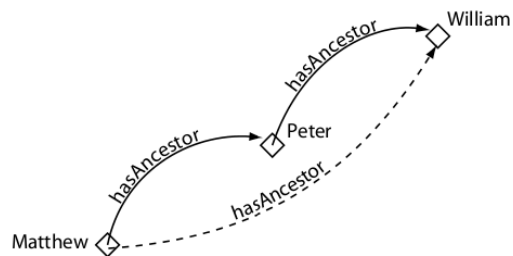
Funcional



Inversa funcional

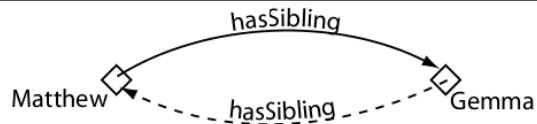


Transitiva

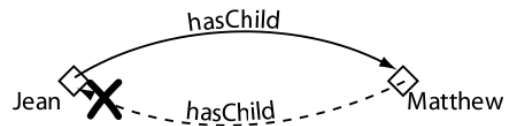


# Proprietateak

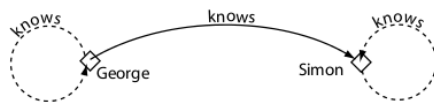
Simetrica



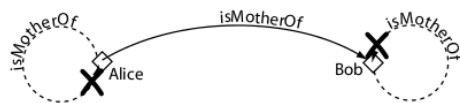
Antisimetrica\*



Reflexiva

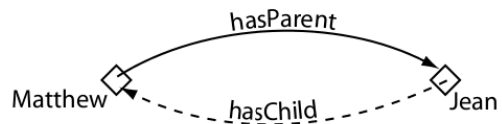


Irreflexiva\*

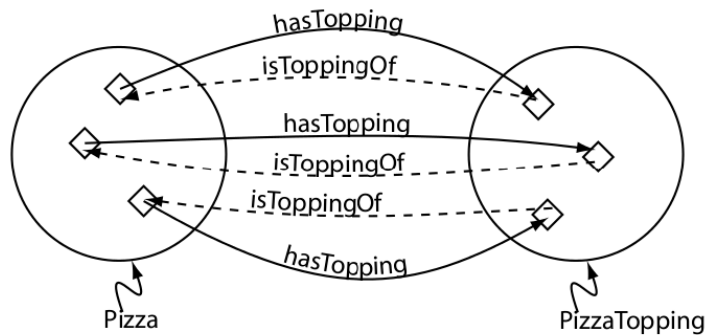


# Propietateak

Propiedades inversas



Dominio y rango



# Banakoak

Klase bateko edo gehiagoko kidea (Type)

Berdin (SameAs) edo desberdin (DifferentFrom) beste norbaitengandik

Beste norbait edo datuekin dituen erlazio binarioak (hirukoitza), positiboak edo negatiboak

# Arrazonamendu automatikoa

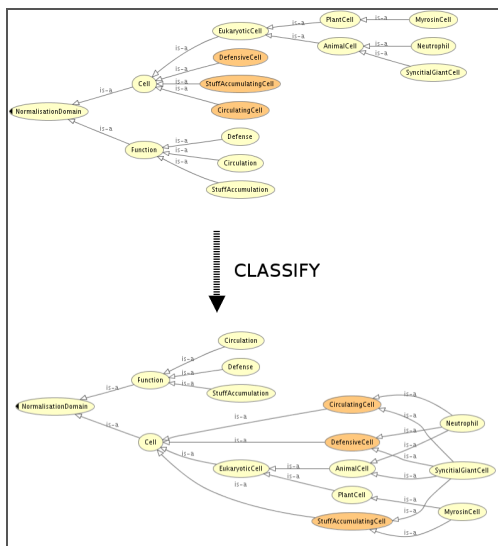
Arrazonatzaile batek ontologian sartu ditugun axiomak dakartzaten "berriak" diren axiomak ondorioztatzen ditu

Arrazonatzaileak axiomak guztiak ondorioztatzen ditu; ezagutza konplexuarekin lan egiteko baliagarria da

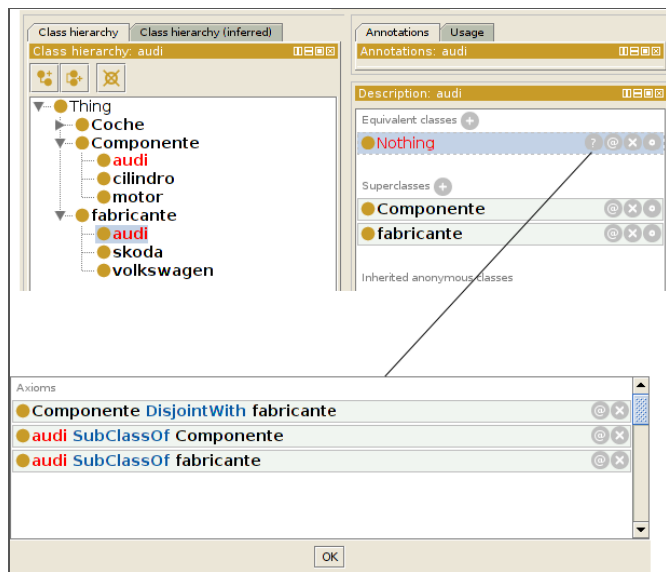
Open World Assumption

No Unique Name Assumption

# Arrazonamendu automatikoa: taxonomia mantendu



# Arrazonamendu automatikoa: konsistentzia



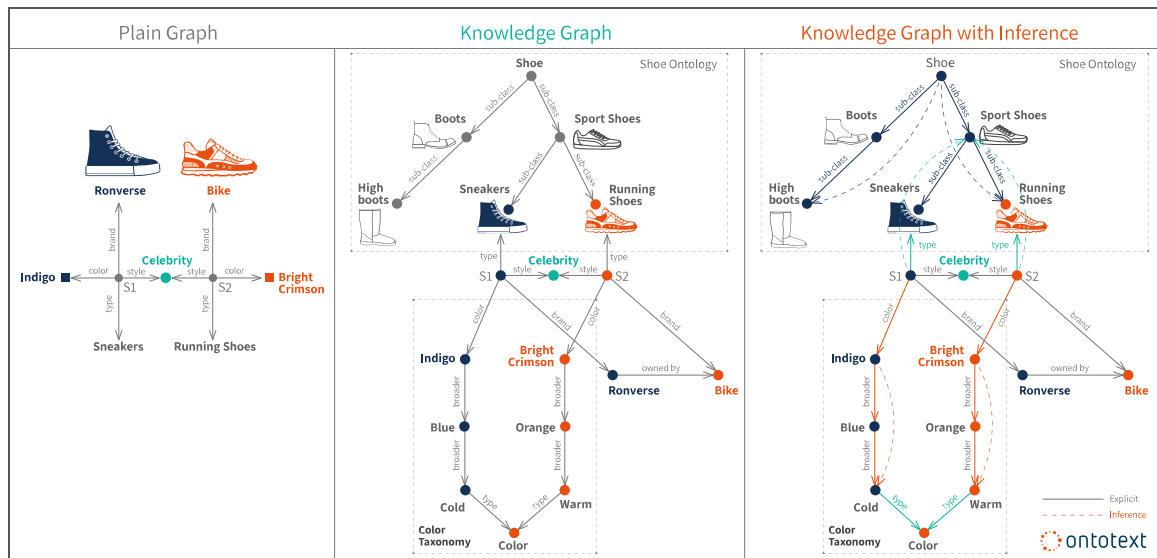


# Arrazonamendu automatikoa: klasifikatu

Entitateak sailkatu: entitate berri bat emanda, nola erlazionatzen den beste entitateekin (mota, equivalentTo, subClassOf, hirukoitza)

Kontsulta entitate anonimo bat da, ontologiaren kontra sailkatzen duguna, entitate bat balitz bezala

# Knowledge Graphs



# Knowledge Graphs

WikiData: <https://www.wikidata.org/>

DBPedia: <https://www.dbpedia.org/about/>

Uniprot: <https://sparql.uniprot.org/>

...