

# Lexis

A computational lexicon of modern Greek

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## Challenges

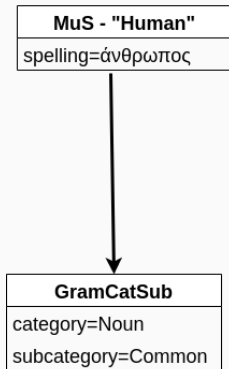
- Stored in a relational database
- R2RML specification lack complex transformation mechanisms

## The Plan

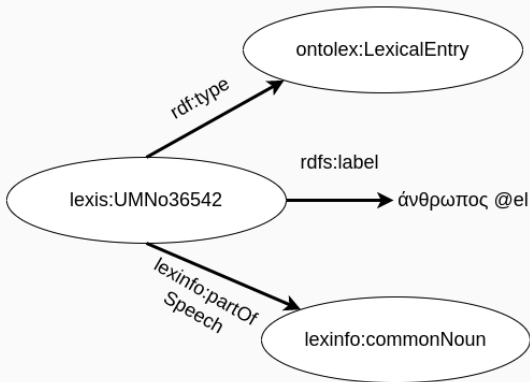
- Mapping from relational data to RDF model (ontolex family and lexInfo)
- Export 1st draft triples with SQL queries from relational database
- Use Fintan to update triples using a mapping mechanism

# Mapping to RDF

## Relation Data



## Mapping to RDF model



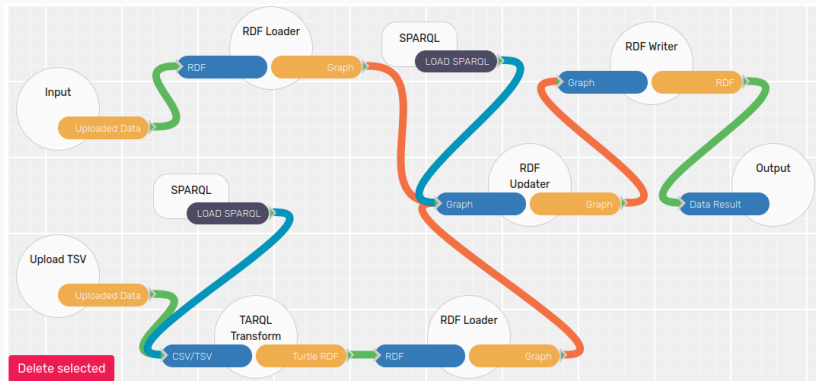
# SQL Query

```
1  SELECT
2  CONCAT('<http://www.exaple.com/lexis/LexicalEntry/', MUS.MUSID, '>'),
3  CONCAT('<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>', ' ',
4  '<http://www.w3.org/ns/lemon/ontolex#LexicalEntry>', ' ;'),
5  CONCAT('<http://www.w3.org/2000/01/rdf-schema#label>', ' ',
6  MUS.NAMING, '"@el ;'),
7  IF(GRAMCATSUB.GRAMSUBCATEN is not NULL,
8  CONCAT('<http://www.exaple.com/lexis/#partOfSpeech>', ' ',
9  GRAMCATSUB.GRAMCATEN, ' ', GRAMCATSUB.GRAMSUBCATEN, '" ;'),
10  CONCAT('<http://www.exaple.com/lexis/#partOfSpeech>', ' ',
11  GRAMCATSUB.GRAMCATEN, '" ;')
12  ),
13  IF(GRAMCATSUB.GRAMSUBCATEN is not NULL,
14  CONCAT('<http://www.lexinfo.net/ontology/3.0/lexinfo#partOfSpeech>',
15  ' ', GRAMCATSUB.GRAMCATEN, ' ', GRAMCATSUB.GRAMSUBCATEN, '" .'),
16  CONCAT('<http://www.lexinfo.net/ontology/3.0/lexinfo#partOfSpeech>',
17  ' ', GRAMCATSUB.GRAMCATEN, '" .')
18  )
19  from MUS
20  INNER JOIN GRAMCATSUB
21  ON MUS.GRAMCATSUBID=GRAMCATSUB.GRAMCATSUBID
22  INTO OUTFILE 'lexis_lexical_entries.csv'
23  ) FIELDS TERMINATED BY '\t';
```

# Triples generated from SQL Query

```
<http://www.exaple.com/lexis/LexicalEntry/UMNo36542>  
  <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://www.w3.org/ns/lemon/ontolex#LexicalEntry> ;  
  <http://www.w3.org/2000/01/rdf-schema#label> "άνθρωπος"@el ;  
  <http://www.exaple.com/lexis/#partOfSpeech> "Noun Common" ;  
  <http://www.lexinfo.net/ontology/3.0/lexinfo#partOfSpeech> "Noun Common" .
```

# Transformation Workflow in Fintan



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<sup>1</sup><https://github.com/Pret-a-LLoD/Fintan>

# Generating Mapping as Graph - TARQL Query

GRAMCATEN	GRAMSUBCATEN	map
Adverb		<a href="http://www.lexinfo.net/ontology/3.0/lexinfo#adverb">http://www.lexinfo.net/ontology/3.0/lexinfo#adverb</a>
Adjective		<a href="http://www.lexinfo.net/ontology/3.0/lexinfo#adjective">http://www.lexinfo.net/ontology/3.0/lexinfo#adjective</a>
Adposition	Preposition	<a href="http://www.lexinfo.net/ontology/3.0/lexinfo#preposition">http://www.lexinfo.net/ontology/3.0/lexinfo#preposition</a>
Article	Definite	<a href="http://www.lexinfo.net/ontology/3.0/lexinfo#definiteArticle">http://www.lexinfo.net/ontology/3.0/lexinfo#definiteArticle</a>
Article	Indefinite	<a href="http://www.lexinfo.net/ontology/3.0/lexinfo#indefiniteArticle">http://www.lexinfo.net/ontology/3.0/lexinfo#indefiniteArticle</a>
Conjunction	Coordinative	<a href="http://www.lexinfo.net/ontology/3.0/lexinfo#coordinatingConjunction">http://www.lexinfo.net/ontology/3.0/lexinfo#coordinatingConjunction</a>
Conjunction	Subordinative	<a href="http://www.lexinfo.net/ontology/3.0/lexinfo#subordinatingConjunction">http://www.lexinfo.net/ontology/3.0/lexinfo#subordinatingConjunction</a>
Interjection		<a href="http://www.lexinfo.net/ontology/3.0/lexinfo#interjection">http://www.lexinfo.net/ontology/3.0/lexinfo#interjection</a>

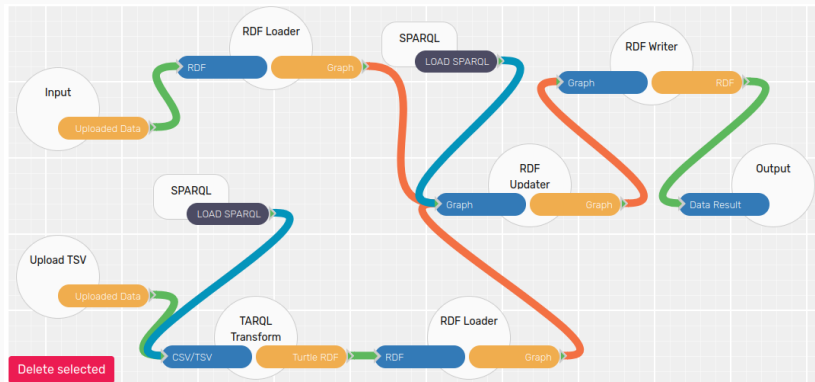
```
1 PREFIX conll: <https://github.com/acoli-repo/conll-rdf/blob/master/owl/conll.ttl#>
2
3 CONSTRUCT {
4   ?map_uri conll:replace ?mapped
5 } WHERE {
6   BIND(CONCAT(?GRAMCATEN, ' ', ?GRAMSUBCATEN) as ?mapped)
7   BIND(URI(?map) as ?map_uri)
8 }
9
```

# Generating Mapping as Graph - Generated RDF Graph

```
4
5 <http://www.lexinfo.net/ontology/3.0/lexinfo#preposition>
6     conll:replace "Adposition Preposition" .
7
8 <http://www.lexinfo.net/ontology/3.0/lexinfo#definiteArticle>
9     conll:replace "Article Definite" .
10
11 <http://www.lexinfo.net/ontology/3.0/lexinfo#indefiniteArticle>
12     conll:replace "Article Indefinite" .
13
14 <http://www.lexinfo.net/ontology/3.0/lexinfo#coordinatingConjunction>
15     conll:replace "Conjunction Coordinative" .
16
17 <http://www.lexinfo.net/ontology/3.0/lexinfo#subordinatingConjunction>
18     conll:replace "Conjunction Subordinative" .
19
20 <http://www.lexinfo.net/ontology/3.0/lexinfo#cardinalNumeral>
21     conll:replace "Numeral Cardinal" .
```



# Transformation Workflow in Fintan



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<sup>2</sup><https://github.com/Pret-a-LLoD/Fintan>

# SPARQL Query update

```
1 PREFIX ontollex: <http://www.w3.org/ns/lemon/ontollex#>
2 PREFIX lexinfo: <http://www.lexinfo.net/ontology/3.0/lexinfo#>
3 PREFIX lime: <http://www.w3.org/ns/lemon/lime#>
4 PREFIX conll: <https://github.com/acoli-repo/conll-rdf/blob/master/owl/conll.ttl#>
5 PREFIX apertium: <http://wiki.apertium.org/wiki/Bidix#>
6
7 DELETE { ?entry lexinfo:partOfSpeech ?lexis_tag }
8 INSERT { ?entry lexinfo:partOfSpeech ?lexinfo_tag }
9 WHERE {
10   ?entry a ontollex:LexicalEntry .
11   ?entry lexinfo:partOfSpeech ?lexis_tag .
12   GRAPH <http://mapping> {
13     ?lexinfo_tag conll:replace ?lexis_tag
14   }
15 }
16
```

# Results

## Sample

```
<http://www.exaple.com/lexis/LexicalEntry/UMNo36542>
  a      <http://www.w3.org/ns/lemon/ontolex#LexicalEntry> ;
  <http://www.w3.org/2000/01/rdf-schema#label>
    "άνθρωπος"@el ;
  <http://www.exaple.com/lexis/#partOfSpeech>
    "Noun Common" ;
  <http://www.lexinfo.net/ontology/3.0/lexinfo#partOfSpeech>
    <http://www.lexinfo.net/ontology/3.0/lexinfo#commonNoun> .
```

## Statistics

	Counts
Lexical Entries	63730
Triples	206742

[https://github.com/nexuslinguarum/  
SD-LL0D-22\\_Lexis](https://github.com/nexuslinguarum/SD-LL0D-22_Lexis)

Thank you!