

# Part 5

## Exploiting the KG

- 1 Part 0 - Course Organization
- 2 Part 1 - The Reuse Problem
- 3 Part 2 - State of the Art
- 4 Part 3 - The Solution iTelos
- 5 Part 4 - The iTelos Methodology
- 6 Part 5 - Exploiting the KG**

## Exploiting the KG

- GraphDB
- SPARQL

## What is a GraphDB?

### GraphDB

It is an enterprise ready Semantic Graph Database developed by Ontotext and it is compliant with W3C Standards.

GraphDB is just one implementation, there is a lot of competition:

- Neo4J
- TerminusDB
- ArangoDB
- OpenRDF (previously Sesame)
- many other...

## How to install GraphDB ?

- Download the package from <https://graphdb.ontotext.com>;
- Use Docker `$ docker run -d -p 127.0.0.1:7200:7200 ontotext/graphdb:10.1.1-arm64` If using ARM you need the proper image.

There is a *free version*, but also two proprietary license that include additional functionalities. For the course the free version is enough.

## Concepts

- Database → Repository;
- Record → Node (aka Entity);
- Field → Triple;
- SQL → SPARQL;
- Table → Graph.

## Datasets

- Documentation of the Dataset here (<https://platform.ontotext.com/semantic-objects/datasets/starwars.html>)
- Dataset in the documentation or here (<http://shorturl.at/exLOP>)

## Tricks

- GraphDB allows you to upload up to 200MB.

```
$ python -m SimpleHTTPServer 8081
```

```
$ python3 -m http.server --bind 127.0.0.1 8080
```

## Exploiting the KG

- GraphDB
- SPARQL

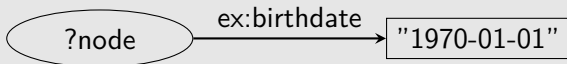


## SPARQL

### Definition

SPARQL is a **protocol** and a declarative **query language** for RDF.

### Example



- Select a subgraphs that corresponds to the declaration;
- Uses pattern-matching.

## Example Query

### Example

```
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-
syntax-ns#>

SELECT ?s
WHERE {
    ?s ?p ?o .
} LIMIT 100
```

- Preamble
- Action (SELECT, DESCRIBE, ASK, CONSTRUCT)
- Source
- Pattern
- Solution modifier (LIMIT, ORDER BY, OFFSET)

## Query Pattern

- Basic Graph Pattern
- Group Graph Pattern
- Optional Graph Pattern
- Union Graph Pattern
- *Graph Graph Pattern*
- Constraint (FILTER BY)

### Is not over!

**SPARQL is a protocol!** It can query remote KGs, generate new entities, perform data migration and so on.

Cheatsheet (BASIC) → <https://shorturl.at/ejouR>

Full documentation → <https://www.w3.org/TR/sparql11-query/>