# Visual Search Demonstrator

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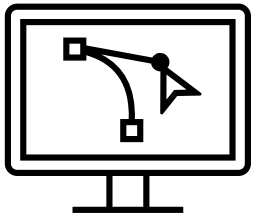
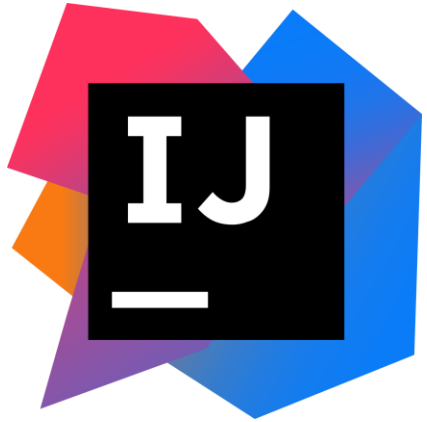
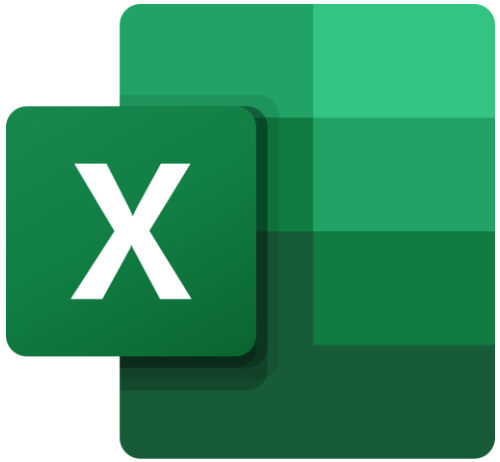


# CONTENTS

- **Visual search demonstrator** built using **Sparnatural**, a tool that enables intuitive **SPARQL query building** through a natural language-inspired interface
- **Accessible**, **user-friendly** way to **explore** and **analyse** election-related data stored in **GraphDB**
- **Elections Graph** – structured data about **Bulgarian parliamentary** and **local elections** from multiple years, including **sections**, **parties**, **candidates**, and **vote counts**
- **Sparnatural integration** – can be **embedded** in any **HTML page** as a custom **Web Component**
- **Sparnatural configuration** – entirely driven by **SHACL files**, which describe the **structure** and **semantics** of the underlying data

SPARNATURAL


# Elections Knowledge Graph

https://elections.ontotext.com/graphdb/

Local

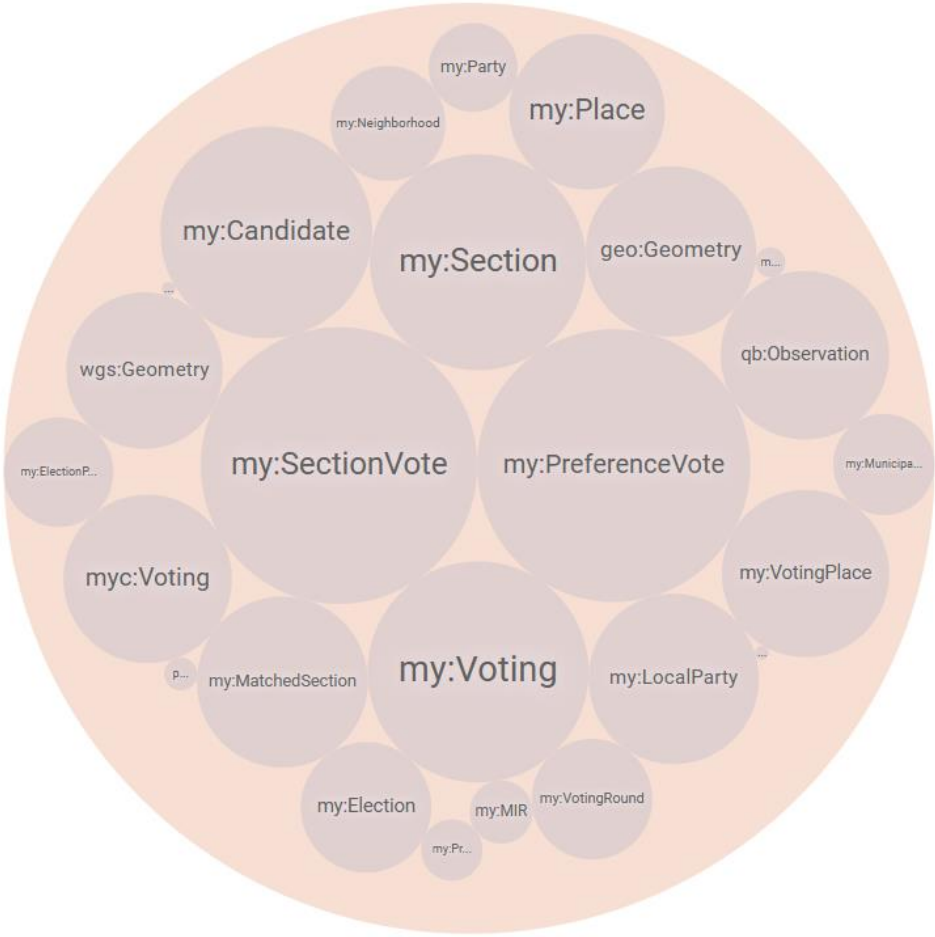
elections · elections

total statements
69,055,054

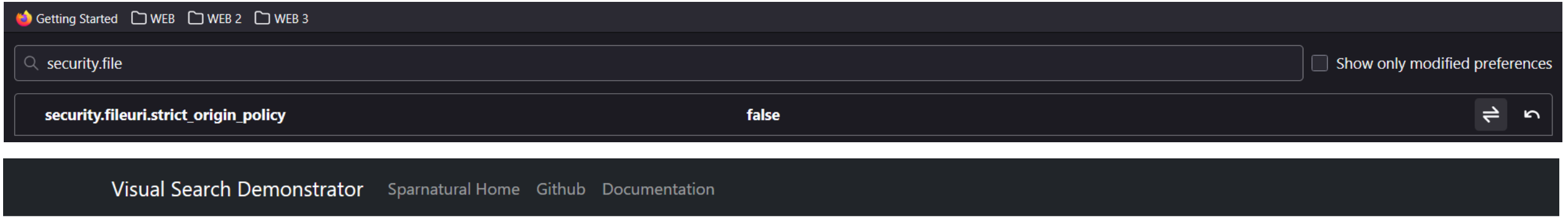
69,055,054 explicit
0 inferred
1.00 expansion ratio

Import RDF data

Export RDF data

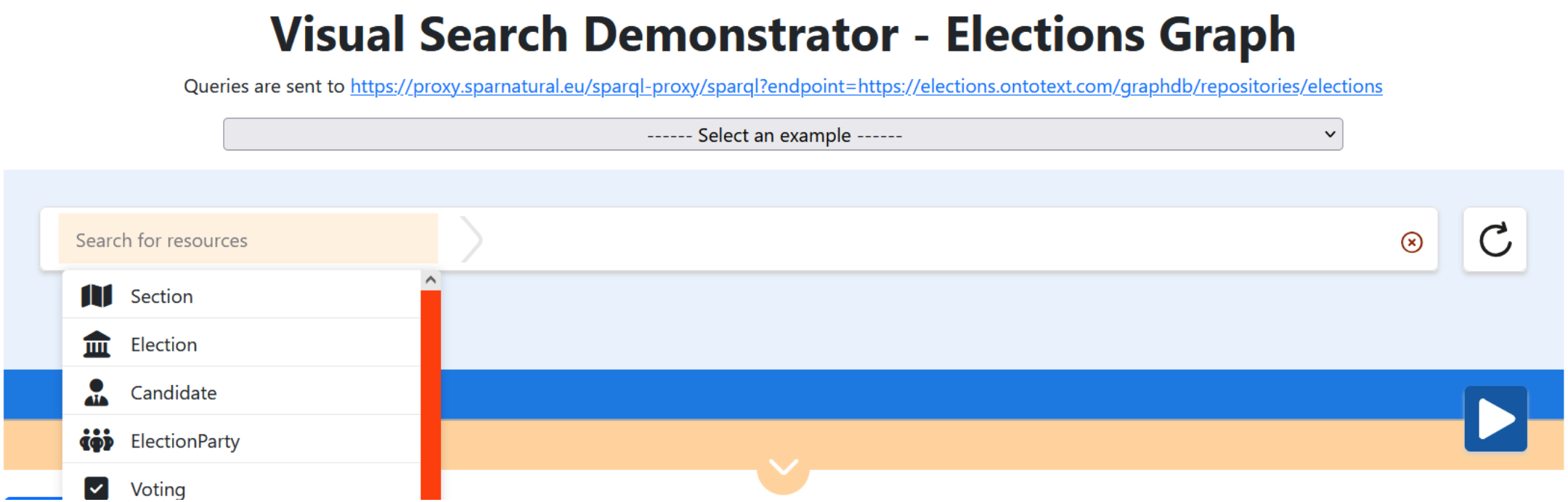


# 1. Enable dynamic loading of local files in Firefox Browser









# 2. Connect with Elections Graph in GraphDB using proxy

```
<spar-natural
    src="myconfig.ttl"
    endpoint="https://proxy.sparnatural.eu/sparql-
proxy/sparql?endpoint=https://elections.ontotext.com/graphdb/repositories/elections"
    lang="en"
    defaultLang="en"
    distinct="true"
    limit="1000"
    debug="true">
</spar-natural>
```

## SPARQL Proxy

This is a proxy for SPARQL endpoints, to avoid CORS or security issues, when an HTML page deployed on an `https` server wants to query a SPARQL service deployed on a `http` server.

The proxy simply works by issuing SPARQL query to `sparql?endpoint={your-encoded-sparql-endpoint-url}`. These URL are SPARQL-compliant endpoints, and in particular they expect a `query` URL parameter

Here is a test link : sparql?query=SELECT%20%2A%20WHERE%20%7B%3Fs%20%3Fp%20%3Fo%7D%20LIMIT%2010&endpoint=http%3A%2F%2Fdbpedia.org%2Fsparql

**/!\ Warning:** of course this is only a temporary workaround, you must not use this proxy in production !

# 3. Setup configuration

| *URI of the entities. This column will use the "this" prefix declared in the prefixes tab.* | *The sort order of the entity in the class dropdown list. This is an integer, e.g. "1", "2", etc.* | *The Fontawesome icon code for the class, e.g. "fa-duotone fa-user". Search for icon codes at https://fontawesome.com/. Fontawesome provides a limited number of icons for free, and you can buy a license to access the full set of icons.* | *This should **always** be sh:NodeShape.* | *This is the identifier of the class in the OWL ontology to which the entity in the configuration corresponds. This column will use the prefix of your ontology declared in the "prefixes" tab.* | *English label that will be displayed in Sparnatural.* | *French display label. Adjust the language code in the cell below to another language if needed.* | *The English tooltip for the entity.* |
|---|---|---|---|---|---|---|---|
| **URI** | **sh:order^^xsd:integer** | **volipi:iconName** | **rdf:type(separator=", ")** | **sh:targetClass** | **rdfs:label@en** | **rdfs:label@fr** | **sh:description@en** |
| my:Section | 1 | fa-solid fa-map | sh:NodeShape | my:Section | Section | | Represents a voting section or precinct where voting takes place |
| my:Election | 2 | fa-solid fa-landmark | sh:NodeShape | my:Election | Election | | Denotes a specific electoral event, such as a parliamentary or local election. |
| my:Candidate | 3 | fa-solid fa-user-tie | sh:NodeShape | my:Candidate | Candidate | | Represents an individual who is running for election. |
| my:ElectionParty | 4 | fa-solid fa-people-group | sh:NodeShape | my:ElectionParty | ElectionParty | | Represents a political party participating in a particular election. |
| my:Voting | 5 | fa-solid fa-check-square | sh:NodeShape | my:Voting | Voting | | Captures the act of casting a vote in an election. |
| my:Place | 6 | fa-solid fa-location-dot | sh:NodeShape | my:Place | Place | | Denotes a geographical location, such as a city or town. |
| my:VotingRound | 7 | fa-solid fa-circle-nodes | sh:NodeShape | my:VotingRound | VotingRound | | Captures the voting data specific to a particular round of an election. |
| my:Party | 8 | fa-solid fa-flag | sh:NodeShape | my:Party | Party | | Represents a political party. |
| my:Municipality | 9 | fa-solid fa-city | sh:NodeShape | my:Municipality | Municipality | | Denotes a local administrative division, such as a city or town. |
| my:VotingPlace | 10 | fa-solid fa-house-flag | sh:NodeShape | my:VotingPlace | VotingPlace | | Represents the physical location where voting occurs. |
| my:LocalParty | 11 | fa-solid fa-person | sh:NodeShape | my:LocalParty | LocalParty | | Represents a political party operating at a local level. |
| my:MIR | 12 | fa-solid fa-diagram-project | sh:NodeShape | my:MIR | MIR | | Denotes a multi-member electoral region. |
| my:Province | 13 | fa-solid fa-map-location | sh:NodeShape | my:Province | Province | | Represents a provincial administrative division. |
| my:MatchedSection | 14 | fa-solid fa-link | sh:NodeShape | my:MatchedSection | MatchedSection | | Denotes a section that has been matched or aligned with another entity. |
| my:Neighborhood | 15 | fa-solid fa-house-chimney | sh:NodeShape | my:Neighborhood | Neighborhood | | Represents a smaller administrative or residential area within a municipality. |
| my:District | 16 | fa-solid fa-border-all | sh:NodeShape | my:District | District | | Denotes an electoral district or constituency. |

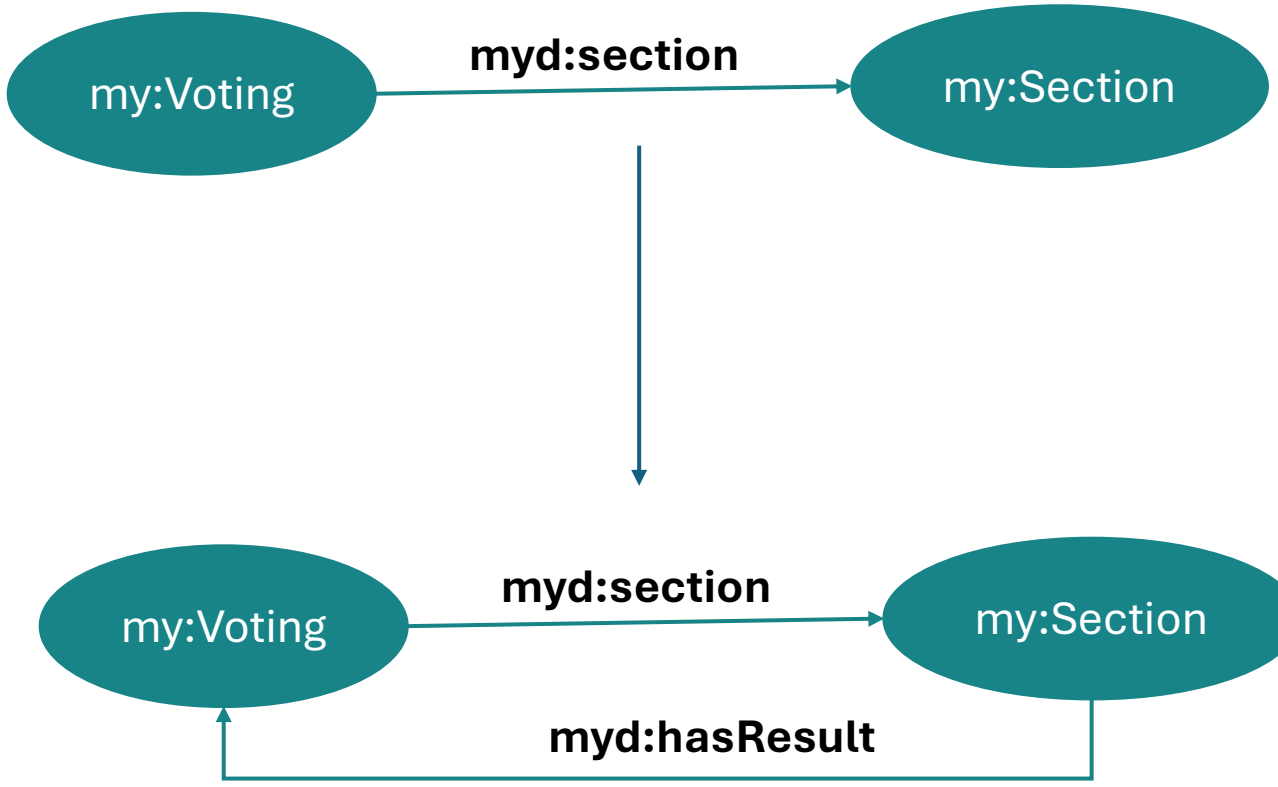
# 3. Setup configuration

| | | | | | | |
|---|---|---|---|---|---|---|
| **my:MIR** | | | | | | |
| wgs:hasGeometry_mi | (wgs:hasGeometry wgs | my:MIR | 83 | hasGeometry | | Specifies the location of the given MIR. |
| myd:number | myd:number | my:MIR | 84 | number | | Specifies the number of the given MIR. |
| myd:wdid | myd:wdid | my:MIR | 85 | wdid | | Specifies the wikidata entity for the given MIR. |
| **my:Neighborhood** | | | | | | |
| myd:district_str | myd:district_str | my:Neighborhood | 86 | district_str | | Specifies the district of the given neighborhood. |
| myd:number | myd:number | my:Neighborhood | 87 | number | | Specifies the number of the given neighborhood. |
| myd:neighborhood | myd:neighborhood | my:Section | 88 | neighborhood | | Specifies the neighborhood for the given section. |
| **my:District** | | | | | | |
| myd:mir | myd:mir | my:District | 89 | mir | | Specifies the MIR of the given district. |
| myd:municipality | myd:municipality | my:District | 90 | municipality | | Specifies the municipality of the given district. |
| myd:number | myd:number | my:District | 91 | number | | Specifies the number of the given district. |
| myd:wikidata_entity | myd:wikidata_entity | my:District | 92 | wikidata_entity | | Specifies the wikidata entity for the given district. |
| myd:district | myd:district | my:Section | 93 | district | | Specifies the district for the given section. |
| **my:VotingPlace** | | | | | | |
| myd:place | myd:place | my:VotingPlace | 94 | place | | Specifies the place for the given voting place. |
| wgs:hasGeometry_vo | (wgs:hasGeometry wgs | my:VotingPlace | 95 | hasGeometry | | Specifies the location of the given voting place. |
| myd:address | myd:address | my:VotingPlace | 96 | address | | Specifies the address of the given voting place. |
| myd:votingPlace | myd:votingPlace | my:Section | 97 | votingPlace | | Specifies the voting place for the given section. |
| **my:MatchedSection** | | | | | | |
| myd:section | myd:section | my:MatchedSection | 98 | section | | Specifies the sections of the matched section. |
| myd:number | myd:number | my:MatchedSection | 99 | number | | Specfies the number of the matched section. |
| myd:matched_section | myd:matched_section | my:Section | 100 | matched_section | | Specifies the matched section for the given section. |

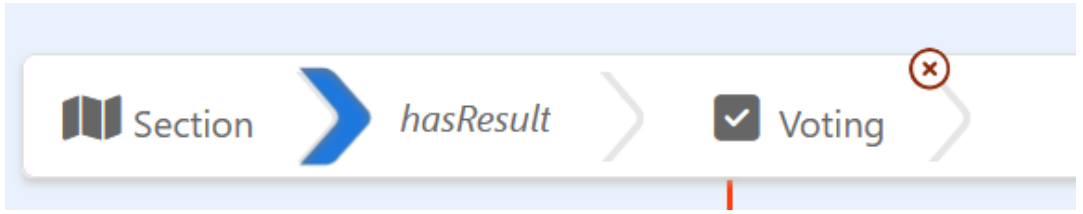
# 3. Setup configuration

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **my:MIR** | | | | | | | |
| wgs:hasGeometry_mi | | sh:Literal | geo:wktLiteral | | core:MapProperty | | |
| myd:number | | sh:Literal | xsd:integer | | core:NumberProperty | | |
| myd:wdid | | sh:IRI | | | core:ListProperty | | |
| **my:Neighborhood** | | | | | | | |
| myd:district_str | | sh:Literal | xsd:string | | core:ListProperty | | |
| myd:number | | sh:Literal | xsd:integer | | core:NumberProperty | | |
| myd:neighborhood | | sh:IRI | | my:Neighborhood | core:ListProperty | | datasources:list_rdfslabel_alpha_with_count_custom |
| **my:District** | | | | | | | |
| myd:mir | | sh:IRI | | my:MIR | core:ListProperty | | datasources:list_rdfslabel_alpha_with_count_custom |
| myd:municipality | | sh:IRI | | my:Municipality | core:ListProperty | | datasources:list_rdfslabel_alpha_with_count_custom |
| myd:number | | sh:Literal | xsd:string | | core:ListProperty | | |
| myd:wikidata_entity | | sh:IRI | | | core:ListProperty | | |
| myd:district | | sh:IRI | | my:District | core:ListProperty | | datasources:list_rdfslabel_alpha_with_count_custom |
| **my:VotingPlace** | | | | | | | |
| myd:place | | sh:IRI | | my:Place | core:ListProperty | | datasources:list_rdfslabel_alpha_with_count_custom |
| wgs:hasGeometry_vo | | sh:Literal | geo:wktLiteral | | core:MapProperty | | |
| myd:address | | sh:Literal | xsd:string | | core:ListProperty | | |
| myd:votingPlace | | sh:IRI | | my:VotingPlace | core:ListProperty | | datasources:list_rdfslabel_alpha_with_count_custom |
| **my:MatchedSection** | | | | | | | |
| myd:section | | sh:IRI | | my:Section | core:ListProperty | | |
| myd:number | | sh:Literal | xsd:string | | core:ListProperty | | |
| myd:matched_section | | sh:IRI | | my:MatchedSection | core:ListProperty | | datasources:list_rdfslabel_alpha_with_count_custom |

# 3.1 Querying inverse properties





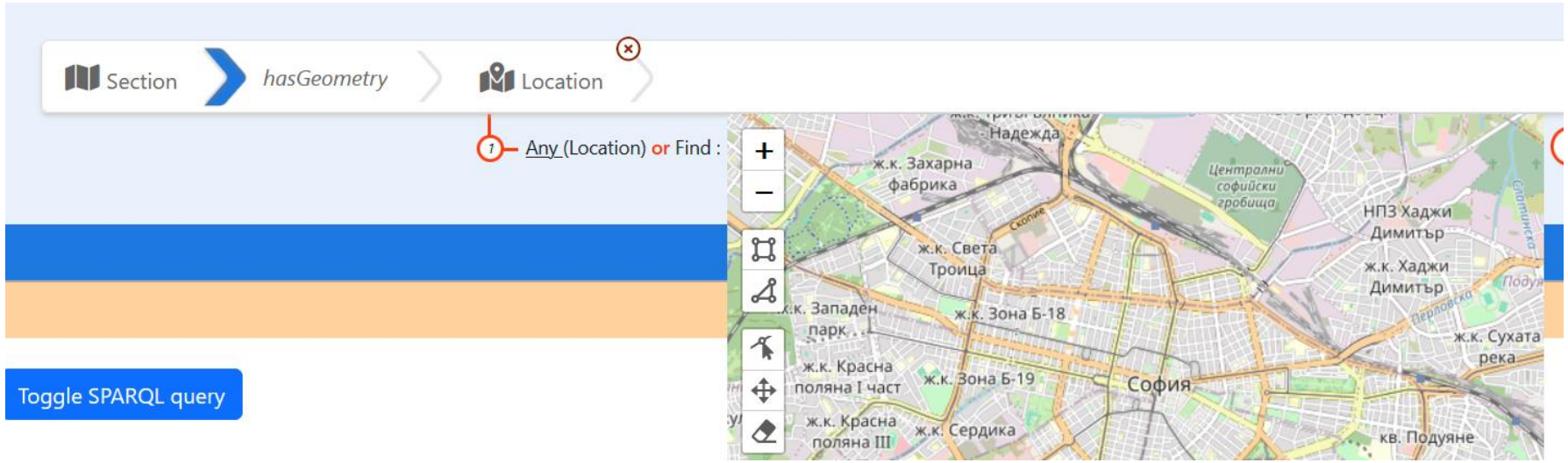



SHACL

```
[sh:inversePath myd:section]
```

# 3.2 Querying a sequence of properties

my:Section —wgs:hasGeometry→ wgs:Geometry —wgs:asWKT→ “Point(23.089722222 42.011944444)”^^geo:wktLiteral




my:Section —wgs:hasGeometry→ “Point(23.089722222 42.011944444)”^^geo:wktLiteral

SHACL

(wgs:hasGeometry wgs:asWKT)

# 4. Convert the spreadsheet in RDF

## https://skos-play.sparna.fr/play/convert?lang=en

Where is the Excel file you want to convert ?

**In one of the included example** — Example 1 (simple exemple, in english)

*Download example : Example 1 (simple exemple, in english)*

**In a local file on my computer** — config.xlsx | Change | Remove

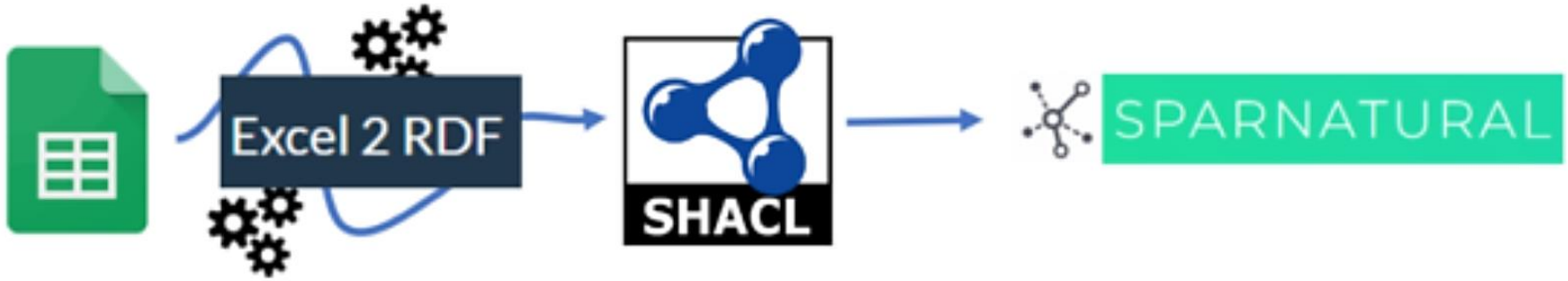
*(Supported extensions : .xls or .xlsx - OpenOffice is not supported !)*

**On the web** — http://...

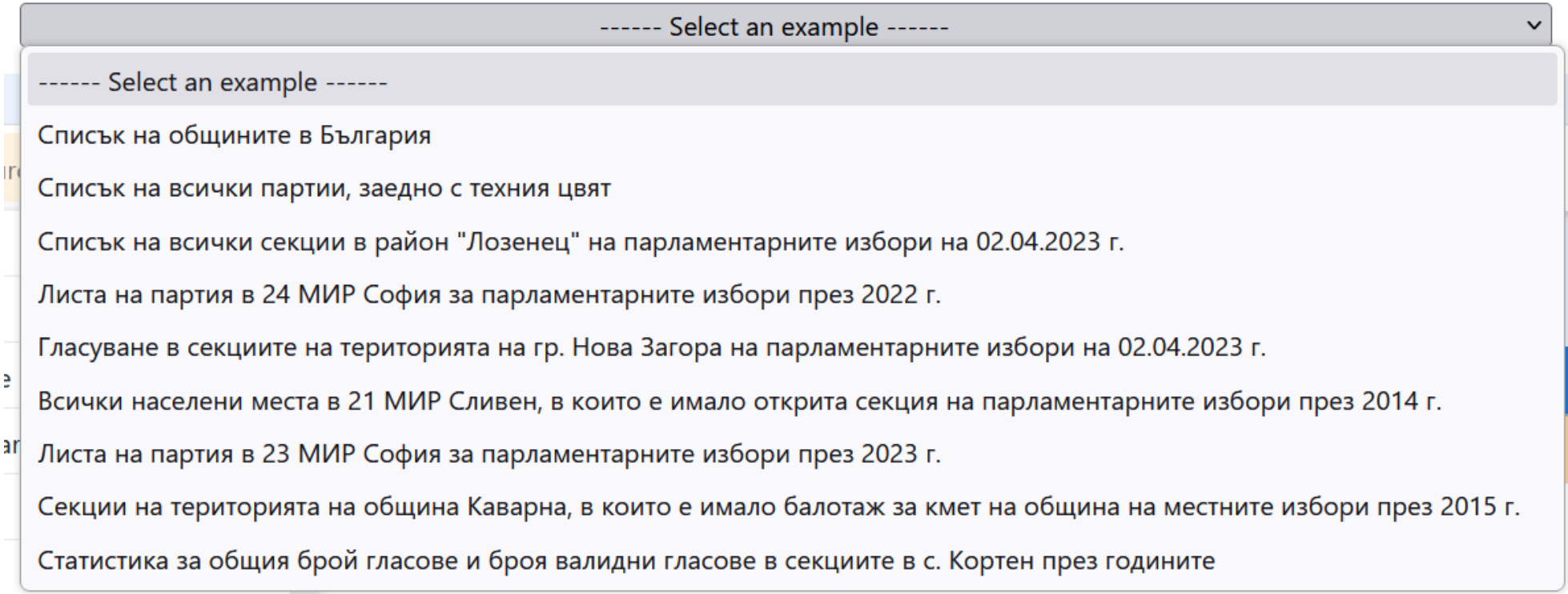
*A link to an excel file available online. You can convert a public Google Sheet :*

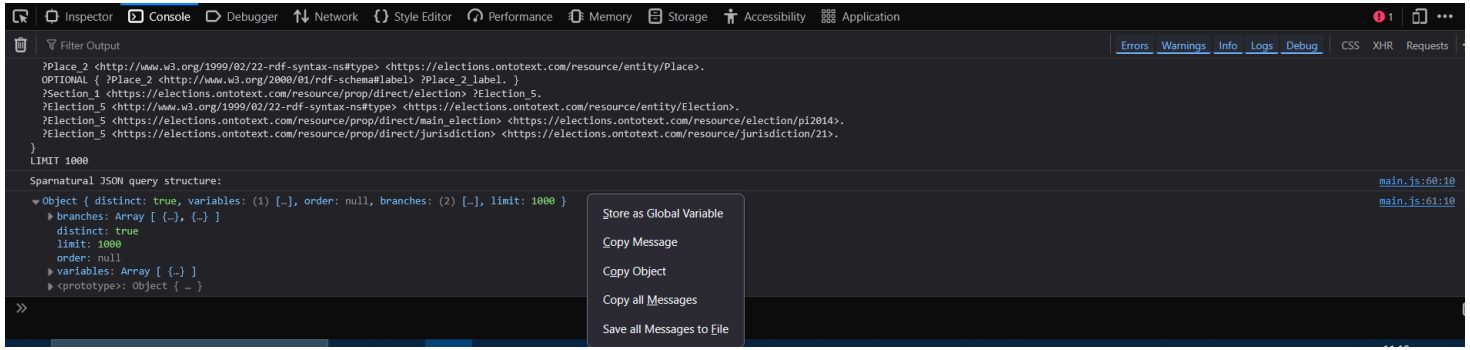
1. *Share the Sheet with everyone ("Everyone with the link" in Sharing options.) It is not possible to convert private Google Sheets.*
2. *Build the Excel download URL of the sheet, which is* `https://docs.google.com/spreadsheets/d/{ID of your spreadhseet}/export?format=xlsx`
3. *Pass this URL to the converter in the above field.*

*For example: https://docs.google.com/spreadsheets/d/1MpN4tzd7S7m7Dnr7IFOz43YoWcSYqUG1/export?format=xlsx (from this spreadsheet)*



# 5. Create example queries

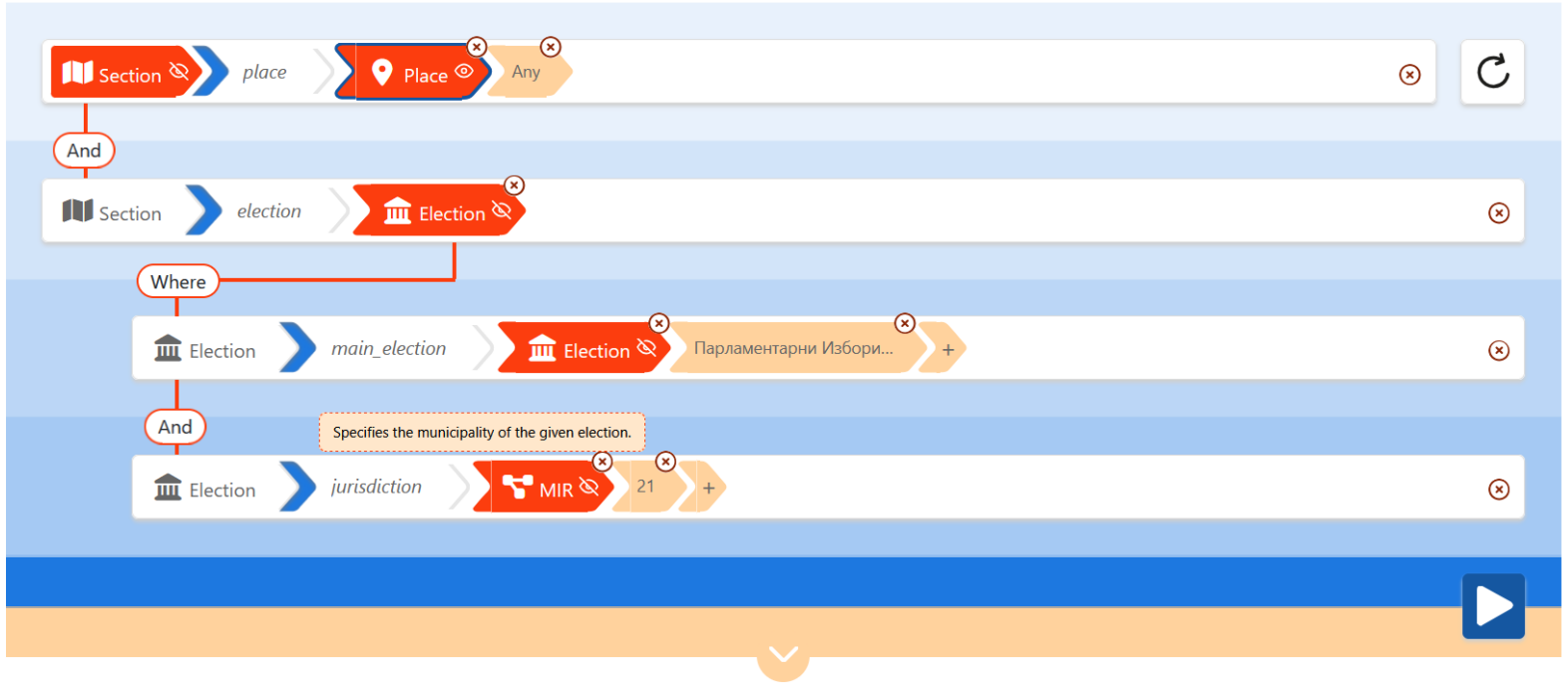


# Visual Search Demonstrator - Elections Graph

Queries are sent to https://proxy.sparnatural.eu/sparql-proxy/sparql?endpoint=https://elections.ontotext.com/graphdb/repositories/elections

Всички населени места в 21 МИР Сливен, в които е имало открита секция на парламентарните избори през 2014 г.




**Секция 234609001 в гр.София**

- main_election : **Парламентарни Избори 2023** (Election)
- municipality : **Столична община** (Municipality)
- neighborhood : **м. Лозенец част 3** (Neighborhood)
- isMobile : false
- streetAddress : 120 ОУ Г.С.Раковски ,пл. Папа Йоан Павел , 7
- district : **Лозенец** (District)
- countMachines : 1
- date : 2023-04-02

**Секция 234609002 в гр.София**

- main_election : **Парламентарни Избори 2023** (Election)
- municipality : **Столична община** (Municipality)
- neighborhood : **м. Лозенец част 3** (Neighborhood)
- isMobile : false
- streetAddress : 120 ОУ Г.С.Раковски ,пл. Папа Йоан П��вел , 7
- district : **Лозенец** (District)
- countMachines : 1
- date : 2023-04-02

**Секция 234609003 в гр.София**

- main_election : **Парламентарни Избори 2023** (Election)
- municipality : **Столична община** (Municipality)
- neighborhood : **м. Лозенец част 3** (Neighborhood)
- isMobile : false
- streetAddress : 120 ОУ Г.С.Раковски ,пл. Папа Йоан Павел , 7
- district : **Лозенец** (District)
- countMachines : 1
- date : 2023-04-02

**Секция 234609004 в гр.София**

- main_election : **Парламентарни Избори 2023** (Election)
- municipality : **Столична община** (Municipality)
- neighborhood : **м. Лозенец част 3** (Neighborhood)
- isMobile : false
- streetAddress : 120 ОУ Г.С.Раковски ,пл. Папа Йоан Павел , 7
- district : **Лозенец** (District)
- countMachines : 1
- date : 2023-04-02

**Секция 234609005 в гр.София**

- main_election : **Парламентарни Избори 2023** (Election)
- municipality : **Столична община** (Municipality)
- neighborhood : **м. Лозенец част 3** (Neighborhood)
- isMobile : false
- streetAddress : 35 СУ ул. Добри Войников , 16
- district : **Лозенец** (District)
- countMachines : 1
- date : 2023-04-02