



Bundesamt für
Kartographie und Geodäsie



Final presentation

Internship made by Pierre MAZUREK and Christopher BLARD

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Presentation of the students



Christopher BLARD

- 22 years old, ESIREM student



Pierre MAZUREK

- 22 years old, ESIREM student

MAZUREK Pierre - BLARD Christopher - final presentation of GeoTimeWFS internship



ESIREM, Informatic/Electronic engineering School, based in Dijon, France



Presentation of the student

Internship : made in 4th year of studies in ESIREM, during 12 weeks minimum



April 12th - July 16th, 2021



April 12th - July 23th, 2021

Technician-type internship
10-minute oral defense and
internship report due during
this internship

Presentation of the students

- Internship of developpment in the GeoTimeWFS application

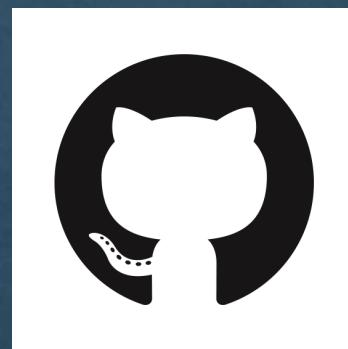


- Working with i3Mainz
- Team work in complete autonomy, where it was necessary to share the workload between the pair and according to the time available



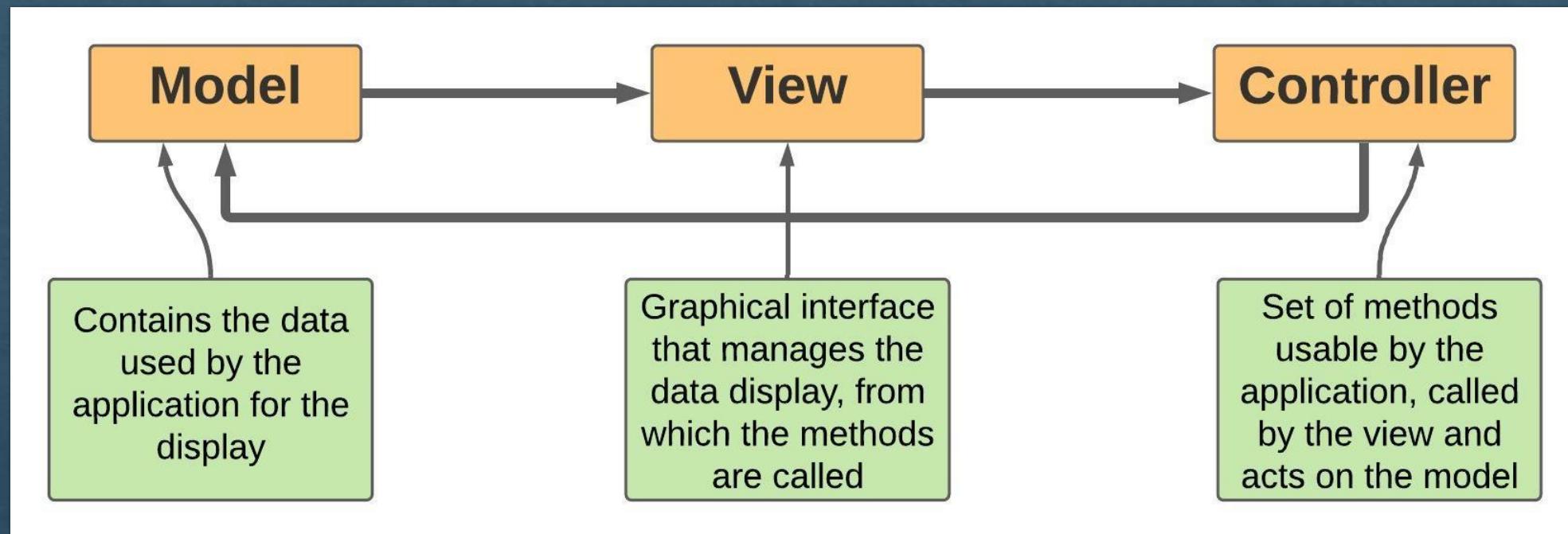
Project building

Informatic elements used to build the project :

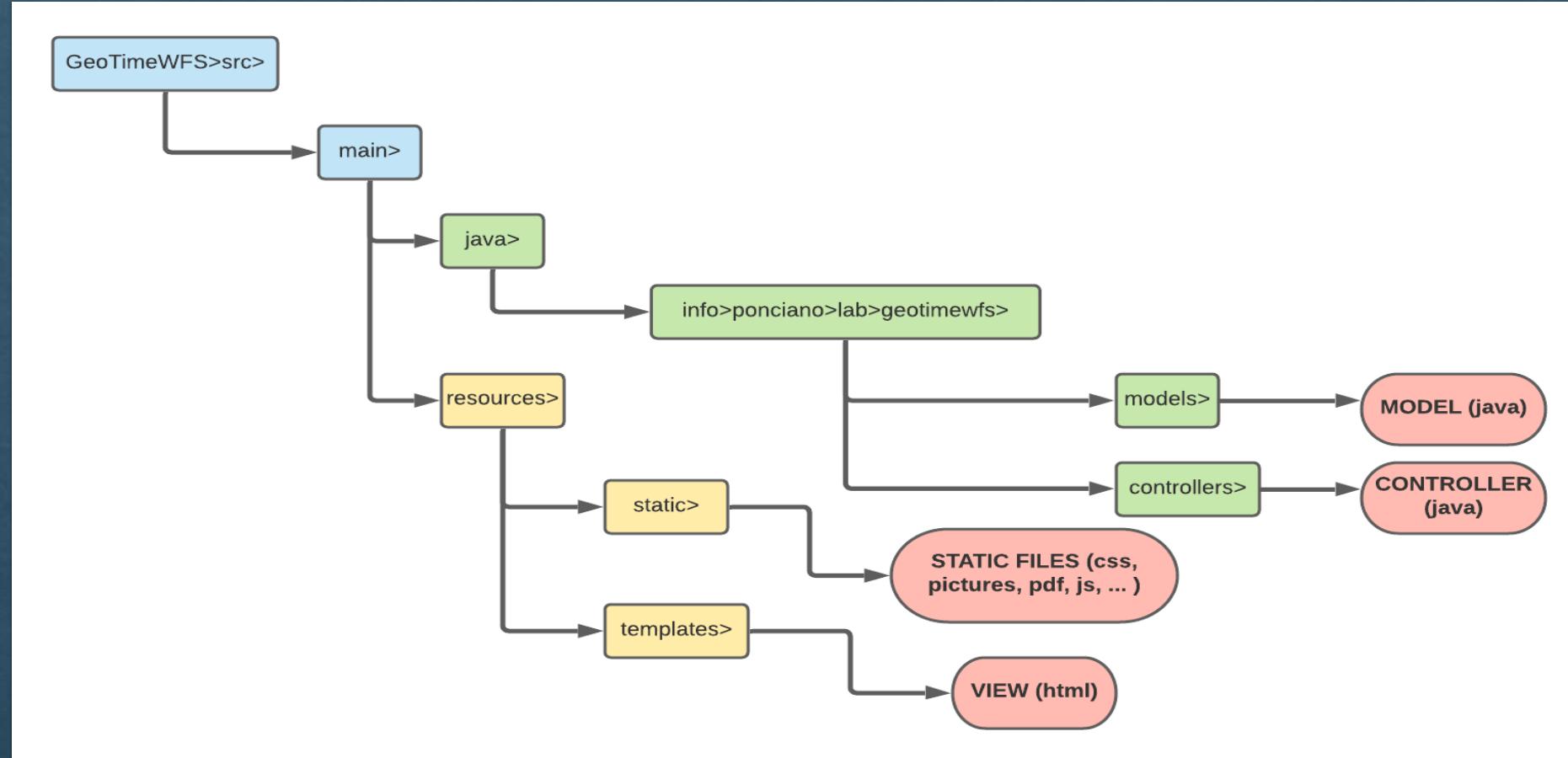


- Spring Boot : free framework used to create project
- Permits to build libraries and project documentation more easily
- GitHub : website and software used to developp informatic tools
- Work with branch system, each developper work on its own branch

Project building



Project building



Presentation of the current application

Presentation of the permanent fields and all the menus

The screenshot shows the homepage of the GDI-DE Linked Data application. At the top, there is a navigation bar with links to Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, and Documentation. The Home link is currently selected. On the left, there is a sidebar with a "HOME PAGE" link. The main content area features a "Provider" section containing the GDI-DE logo and contact information for the Geodateninfrastruktur Deutschland. To the right, there is a "Contact" section with details for the Coordination Office SDI Germany, including postal address, email, and Twitter link. At the bottom, there is a footer with links to XML and JSON versions of the page, and a copyright notice.

English | Login | Contact

GDI-DE

Linked Data

Home

Home

Provider

GDI-DE Geodateninfrastruktur Deutschland
<https://www.gdi-de.org>

Contact

Coordination Office SDI Germany:
Telefon: 069 6333-258
Telefax: 069 6333-446
mail@gdi-de.org
www.gdi-de.org

Postal address:

Coordination Office SDI Germany
Federal Office for Cartography and Geodesy
Richard-Strauss-Avenue 11
60598 Frankfurt am Main, Germany

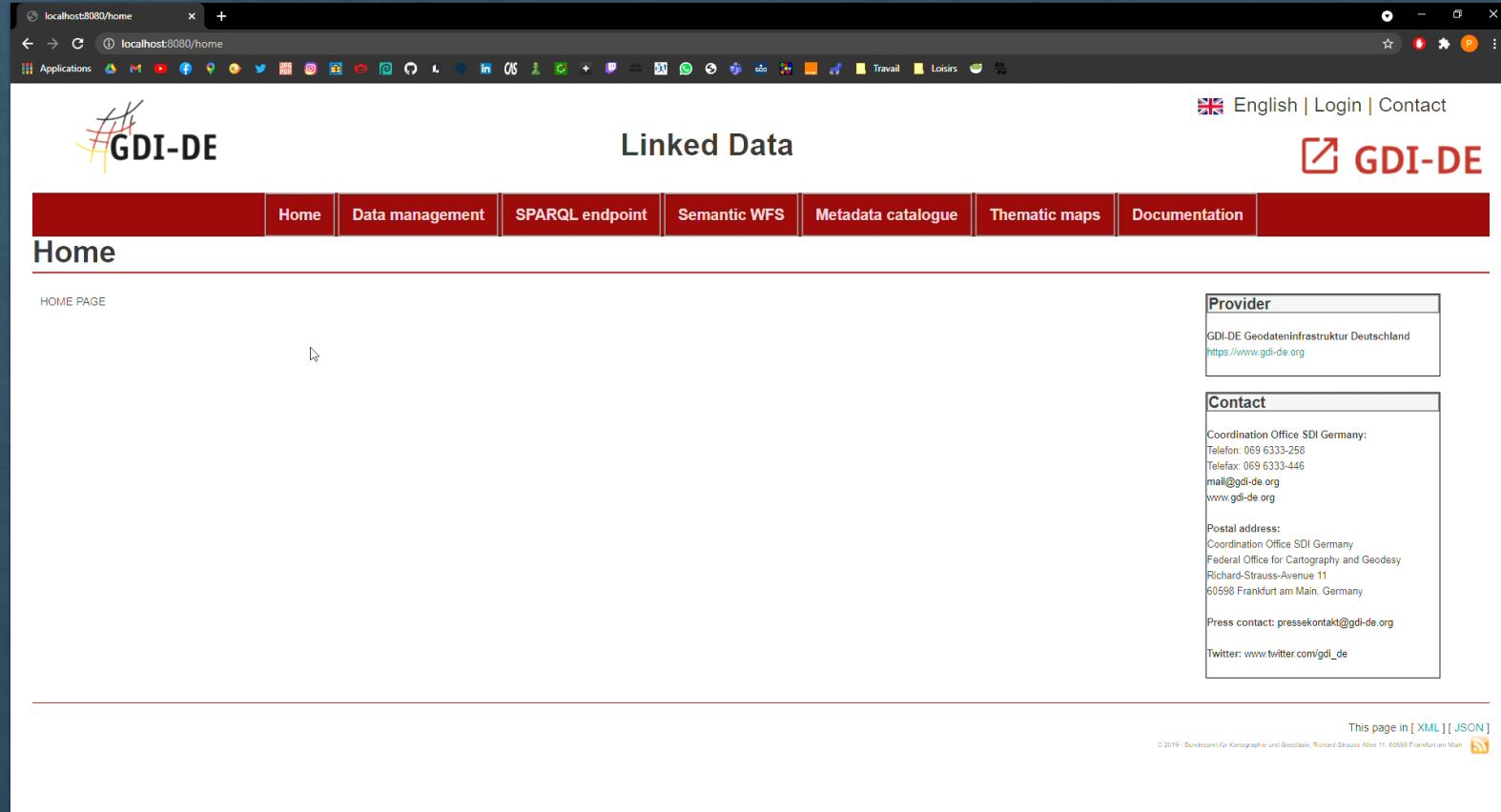
Press contact: pressekontakt@gdi-de.org

Twitter: www.twitter.com/gdi_de

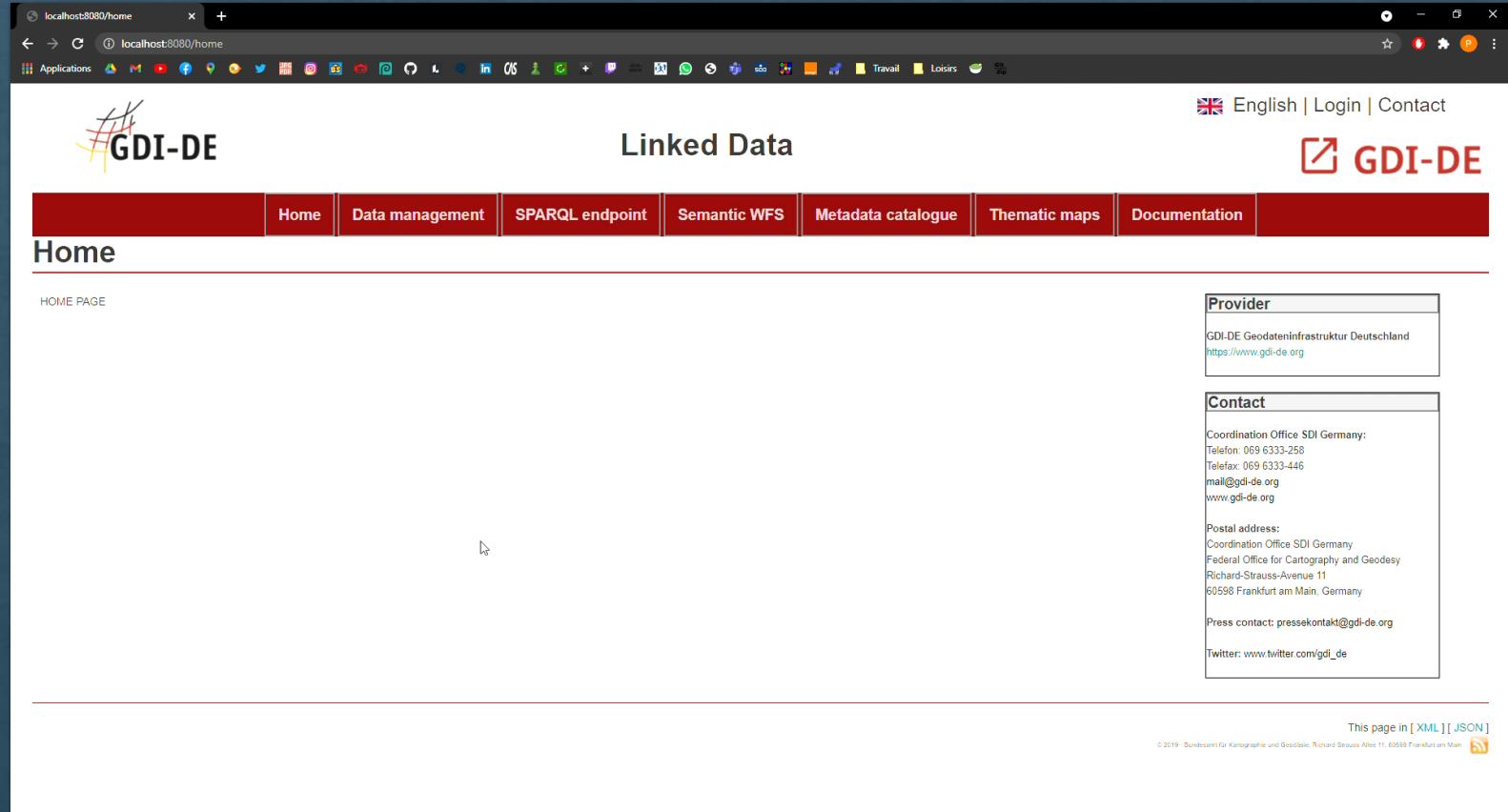
This page in [XML] [JSON]

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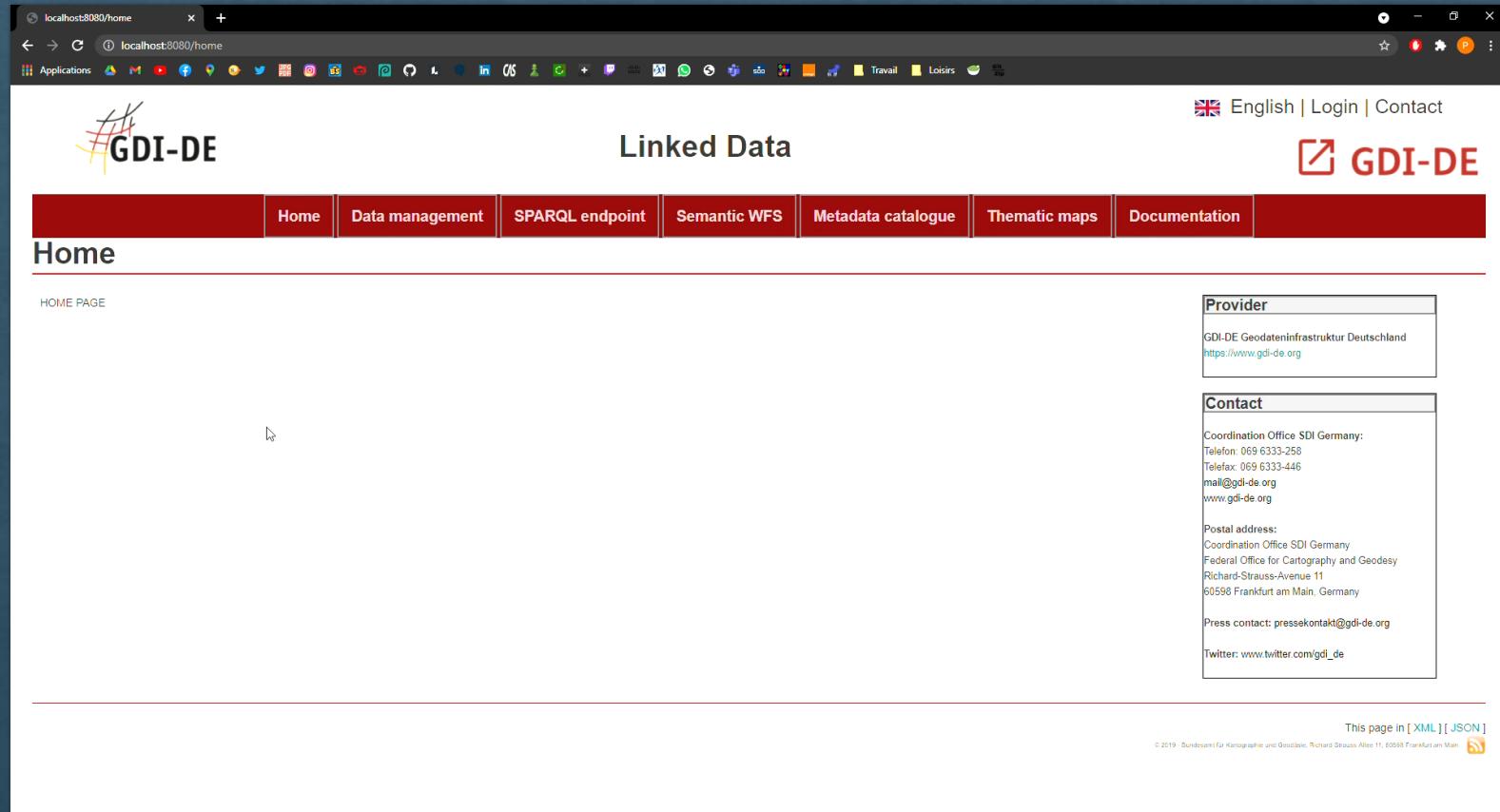
Presentation of the navbar



Presentation of the header



Presentation of Contact and Provider boxes



Presentation of the footer

This page in [[XML](#)] [[JSON](#)]

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Footer, navbar, header and Provider/Contact boxes are **permanent fields** (represented in all the views in the application)

Presentation of the Home Menu

The screenshot shows the GDI-DE website homepage. At the top left is the GDI-DE logo. In the center, the text "Linked Data" is displayed above a navigation bar with links: Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, and Documentation. On the right side of the header are links for English, Login, and Contact, along with the GDI-DE logo. Below the header, a red banner contains the word "Home". Underneath the banner, there is a "HOME PAGE" section and two contact boxes: "Provider" and "Contact". The "Provider" box lists "GDI-DE Geodateninfrastruktur Deutschland" and their website "https://www.gdi-de.org". The "Contact" box provides details for the Coordination Office SDI Germany, including telephone, fax, email, and website, as well as a postal address and press contact information. At the bottom of the page, there is a footer with links for XML and JSON, copyright information, and a Twitter link.

English | Login | Contact

GDI-DE

Linked Data

Home

Home

HOME PAGE

Provider

GDI-DE Geodateninfrastruktur Deutschland
<https://www.gdi-de.org>

Contact

Coordination Office SDI Germany:
Telefon: 069 6333-258
Telefax: 069 6333-446
mail@gdi-de.org
www.gdi-de.org

Postal address:
Coordination Office SDI Germany
Federal Office for Cartography and Geodesy
Richard-Strauss-Avenue 11
60598 Frankfurt am Main, Germany

Press contact: pressekontakt@gdi-de.org
Twitter: www.twitter.com/gdi_de

This page in [XML] [JSON]

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Presentation of the Shapefile importer submenu

The screenshot shows the GDI-DE Linked Data interface. At the top, there is a navigation bar with links to Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, and Documentation. On the far right of the top bar are links for English, Login, and Contact, along with the GDI-DE logo.

The main content area has a header "Linked Data". Below it, a sub-header "Shapefile uplift" is followed by a "Shapefile importer" section. This section contains several input fields and buttons:

- File to upload: Choisir un fichier (Aucun fichier choisi) with an Upload button.
- Metadata: Verwaltungsgebiete Historisch (dropdown menu).
- Dataset title: (empty input field).
- File to upload: Choisir un fichier (Aucun fichier choisi) with an Upload button.

To the right of these fields is a sidebar with the following options:

- Other importers
- Linked Data enrichment
- Schema upload
- Schema verification

On the far right, there are two boxes:

- Provider**: GDI-DE Geodateninfrastruktur Deutschland (<https://www.gdi-de.org>)
- Contact**:
 - Coordination Office SDI Germany:
Telefon: 069 6333-258
Telefax: 069 6333-446
mail@gdi-de.org
www.gdi-de.org
 - Postal address:
Coordination Office SDI Germany
Federal Office for Cartography and Geodesy
Richard-Strauss-Avenue 11
60598 Frankfurt am Main, Germany
 - Press contact: pressekontakt@gdi-de.org
 - Twitter: www.twitter.com/gdi_de

At the bottom right of the page, there is a link "This page in [XML] [JSON]" and a small RSS feed icon. The footer of the page contains the text "© 2019 - Bundesamt für Kartographie und Geodäsie, Richard-Strauss-Allee 11, 60598 Frankfurt am Main".

Presentation of the Linked Data enrichment menu

The screenshot shows a web browser window for the GDI-DE Linked Data enrichment service. The URL is `localhost:8080/enrichment/result`. The page has a red header bar with navigation links: Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, and Documentation. The main content area is titled "Linked Data enrichment". On the left, there's a form with "Class to enrich:" dropdown set to "Schule (Q3914)", "Items number :" slider set to 500, and a "Potential error" section. In the center, a SPARQL query is displayed:

```
SELECT ?item ?itemLabel ?latitude ?longitude WHERE {
?item wdt:P31 wd:Q3914.
?item wdt:P17 wd:Q183.
?item p:P625 ?statement .
?statement psv:P625 ?coordinate_node .
?coordinate_node wikibase:geoLatitude ?latitude .
?coordinate_node wikibase:geoLongitude ?longitude .
SERVICE wikibase:label {
  bd:serviceParam wikibase:language "
[AUTO_LANGUAGE],de".
}
}
LIMIT 500
```

At the bottom of this section is a "Get the query results" button. To the right, there are two boxes: "Provider" (GDI-DE Geodateninfrastruktur Deutschland, <https://www.gdi-de.org>) and "Contact" (Coordination Office SDI Germany, address, phone, fax, email, website, press contact, Twitter). The footer of the page includes a navigation bar with icons.

Presentation of Schema validation menu

The screenshot shows the GDI-DE Linked Data schema validation interface. At the top, there is a navigation bar with links to Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, and Documentation. On the far right of the top bar are English language and login/contact links. Below the navigation bar, the page title is "Linked Data". The main content area has a header "Downlift validation th" followed by a dropdown menu showing "WikidataCity, geojsonld, https" and a "Validate" button. To the right of this, there are four buttons: "Shapefile importer", "Other importers", "Linked Data enrichment", and "Schema upload". Below these is a red button labeled "Schema verification". On the right side of the page, there are two boxes: "Provider" (listing GDI-DE Geodateninfrastruktur Deutschland and its website) and "Contact" (listing the Coordination Office SDI Germany's address, phone number, fax, email, and website). At the bottom of the page, there are links for XML and JSON, and a copyright notice for the Federal Office for Cartography and Geodesy.

English | Login | Contact

GDI-DE

Home Data management SPARQL endpoint Semantic WFS Metadata catalogue Thematic maps Documentation

Downlift validation th

WikidataCity, geojsonld, https

Validate

Shapefile importer

Other importers

Linked Data enrichment

Schema upload

Schema verification

Provider

GDI-DE Geodateninfrastruktur Deutschland
<https://www.gdi-de.org>

Contact

Coordination Office SDI Germany:
Telefon: 069 6333-258
Telefax: 069 6333-446
mail@gdi-de.org
www.gdi-de.org

Postal address:
Coordination Office SDI Germany
Federal Office for Cartography and Geodesy
Richard-Strauss-Avenue 11
60598 Frankfurt am Main, Germany

Press contact: pressekontakt@gdi-de.org

Twitter: www.twitter.com/gdi_de

This page in [XML] [JSON]

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Notes for Data Management menu

- Other importers corresponds to an external link
- The Schema upload view doesn't work and must be corrected

The screenshot shows the GDI-DE website's navigation bar at the top. On the left is the GDI-DE logo. To the right are links for English | Login | Contact. Below the logo is a red navigation bar with tabs: Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, and Documentation. The 'Data management' tab is currently active. A dropdown menu is open under 'Data management', listing: Shapefile importer, Other importers (which is highlighted in blue), Linked Data enrichment, Schema upload, and Schema verification. The main content area is titled 'Linked Data' and contains a 'Provider' section with the GDI-DE contact information and a 'Contact' section with postal and press contact details. At the bottom, there are links for XML and JSON, and a small note about the page being generated by the Bundesamt für Kartographie und Geodäsie.

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Notes for SPARQL endpoint menu

- The SPARQL endpoint menu is about an external link

The screenshot shows the GDI-DE Linked Data page. At the top right, there are links for English, Login, and Contact. The GDI-DE logo is on the left. A navigation bar below the header includes Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, and Documentation. The SPARQL endpoint link is highlighted. The main content area is titled "Home" and "HOME PAGE". To the right, there are two boxes: "Provider" (GDI-DE Geodateninfrastruktur Deutschland, <https://www.gdi-de.org>) and "Contact" (Coordination Office SDI Germany, address, phone, fax, email, website; Postal address; Press contact: pressekontakt@gdi-de.org; Twitter: www.twitter.com/gdi_de). At the bottom right, there are links for XML and JSON, and a small note about the page being generated by the Bundesamt für Kartographie und Geodäsie.

Presentation of the Semantic WFS landing page configuration menu

The screenshot shows the GDI-DE Semantic WFS landing page. At the top, there is a navigation bar with links for Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, and Documentation. The Semantic WFS link is highlighted in red. On the left, there is a sidebar with sections for LandingPage: BKG WFS Service, Landingpage (with API documentation links), and a note about exposing a WFS 1.0.0, 1.1.0, 2.0.0 compatible Webservice. The main content area is titled "Linked Data" and contains three sub-sections: Semantic WFS landing page, Semantic WFS configuration, and Semantic WFS ontology browser. To the right, there are two boxes: "Provider" (GDI-DE Geodateninfrastruktur Deutschland) and "Contact" (Coordination Office SDI Germany, postal address, press contact, and Twitter). At the bottom, there is a footer with links for XML and JSON, and a copyright notice.

GDI-DE English | Login | Contact

Linked Data

LandingPage: BKG WFS Service

Landingpage
Testwebservice with a Triple Store backend

- SemanticWFS API Documentation in [\[HTML\]](#) [\[YAML\]](#) [\[JSON\]](#)
- Conformance Declaration in [\[HTML\]](#) [\[XML\]](#) [\[JSON\]](#)
- Collections Metadata in [\[HTML\]](#) [\[XML\]](#) [\[JSON\]](#)

This homepage also exposes a WFS 1.0.0, 1.1.0, 2.0.0 compatible Webservice:

- GetCapabilities WFS 1.0.0 [\[XML\]](#)
- GetCapabilities WFS 1.1.0 [\[XML\]](#)
- GetCapabilities WFS 2.0.0 [\[XML\]](#)

Semantic WFS

Semantic WFS landing page

Semantic WFS configuration

Semantic WFS ontology browser

Provider
GDI-DE Geodateninfrastruktur Deutschland
<https://www.gdi-de.org>

Contact
Coordination Office SDI Germany:
Telefon: 069 6333-258
Telefax: 069 6333-446
mail@gdi-de.org
www.gdi-de.org

Postal address:
Coordination Office SDI Germany
Federal Office for Cartography and Geodesy
Richard-Strauss-Avenue 11
60598 Frankfurt am Main, Germany

Press contact: pressekontakt@gdi_de.org

Twitter: www.twitter.com/gdi_de

This page in [[XML](#)] [[JSON](#)]

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Notes for Semantic WFS menu

- The Semantic WFS configuration and Semantic WFS configuration menu correspond to external links

The screenshot shows the GDI-DE website's navigation bar and a dropdown menu for the "Semantic WFS" link.

Navigation Bar:

- Home
- Data management
- SPARQL endpoint
- Semantic WFS
- Metadata catalogue
- Thematic maps
- Documentation

Dropdown Menu (Semantic WFS):

- Semantic WFS landing page
- Semantic WFS configuration
- Semantic WFS ontology browser

Right Sidebar:

- Provider:** GDI-DE Geodateninfrastruktur Deutschland <https://www.gdi-de.org>
- Contact:**
 - Coordination Office SDI Germany:
 - Telefon: 069 6333-258
 - Telefax: 069 6333-446
 - mail@gdi-de.org
 - www.gdi.de.org
 - Postal address:
 - Coordination Office SDI Germany
 - Federal Office for Cartography and Geodesy
 - Richard-Strauss-Avenue 11
 - 60598 Frankfurt am Main, Germany
 - Press contact: pressekontakt@gdi-de.org
 - Twitter: www.twitter.com/gdi_de

Page Footer:

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Presentation of the Semantic OCG API Records landing page

GDI-DE

Linked Data

OGC API Records landing page

Landingpage > GeoTime Web Service
Testwebservice with a Triple Store backend

- GeoTimeWFS API Documentation in [\[HTML\]](#) [\[YAML\]](#) [\[JSON\]](#)
- Conformance Declaration in [\[HTML\]](#) [\[JSON\]](#)
- Metadata Catalogues in [\[HTML\]](#) [\[JSON\]](#)

Provider
GDI-DE Geodateninfrastruktur Deutschland
<https://www.gdi-de.org>

Contact
Coordination Office SDI Germany:
Telefon: 069 6333-258
Telefax: 069 6333-446
mail@gdi-de.org
www.gdi-de.org

Postal address:
Coordination Office SDI Germany
Federal Office for Cartography and Geodesy
Richard-Strauss-Avenue 11
60598 Frankfurt am Main, Germany

Press contact: pressekontakt@gdi-de.org

Twitter: www.twitter.com/gdi_de

This page in [[XML](#)] [[JSON](#)]

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Presentation of the Metadata importer menu

The screenshot shows the GDI-DE Linked Data website. At the top, there is a navigation bar with links: Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, Documentation, English, Login, and Contact. The logo "#GDI-DE" is on the left, and the "GDI-DE" logo is on the right.

The main content area has a title "Linked Data" and a sub-section "Metadata importer". On the left, there is a form for uploading files, with a button "Upload". In the center, there is a "Metadata importer" section with a button "Link Metadata to Data". To the right, there are two boxes: "Provider" (containing information about GDI-DE) and "Contact" (containing contact details for the Coordination Office SDI Germany).

At the bottom, there is a link "This page in [XML] [JSON]" and a small feed icon.

Presentation of the Link Metadata to Data menu

The screenshot shows the GDI-DE Linked Data interface. At the top, there is a navigation bar with links: Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, Documentation, English, Login, and Contact. Below the navigation bar, there is a logo for GDI-DE and a section titled "Metadata to data". This section contains dropdown menus for "Metadata:" (set to "Verwaltungsgebiete Historisch") and "Dataset:" (set to "WikidataCity"). A "Submit" button is also present. To the right of this section, a "Provider" box displays "GDI-DE Geodateninfrastruktur Deutschland" and a link to "https://www.gdi-de.org". Below this, a "Contact" box provides information for the Coordination Office SDI Germany, including address, phone, fax, email, and website. It also lists the Postal address of the Federal Office for Cartography and Geodesy and the Press contact email. At the bottom right, there is a link to "This page in [XML] [JSON]" and a small RSS feed icon.

English | Login | Contact

GDI-DE

Linked Data

Metadata to data

Metadata:

Verwaltungsgebiete Historisch

Dataset:

WikidataCity

Submit

Semantic OGC API Records landing page

Metadata importer

Link Metadata to Data

Provider

GDI-DE Geodateninfrastruktur Deutschland
<https://www.gdi-de.org>

Contact

Coordination Office SDI Germany:
Telefon: 069 6333-258
Telefax: 069 6333-446
mail@gdi-de.org
www.gdi-de.org

Postal address:
Coordination Office SDI Germany
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Richard-Strauss-Avenue 11
60598 Frankfurt am Main, Germany

Press contact: pressekontakt@gdi-de.org

Twitter: www.twitter.com/gdi_de

This page in [XML] [JSON]

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Presentation of the Create Thematic maps menu

The screenshot shows a web browser window with the URL localhost:8080/thematicMaps. The page is titled "BKG Linked Data and Semantic Data management". At the top, there is a navigation bar with links: Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps (which is highlighted in red), and Documentation. The "Thematic maps" link is located at the bottom of the navigation bar. On the right side of the page, there are two boxes: "Provider" (GDI-DE Geodateninfrastruktur Deutschland) and "Contact" (Coordination Office SDI Germany). At the bottom, there is a link to "This page in [XML] [JSON]" and a small RSS feed icon.

Presentation of the Thematic maps meu

The screenshot shows the GDI-DE thematic map creation interface. At the top, there is a navigation bar with links for Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps (which is the active page), and Documentation. The Thematic maps link has a dropdown menu with options: Create a thematic map, Spatio-temporal data example, and Thematic maps (which is highlighted in red). On the left, there is a search bar with a dropdown menu showing 'TEST (Q3914)'. Below it are fields for 'Area of search' (with dropdown menus) and 'Data date' (set to '22/07/2021'). There is also a checkbox for 'Extend search with Linked Open Data from WikiData'. A large red 'Generate' button is prominently displayed. To the right, there is a map viewer showing a map of Nierstein and Oppenheim, with zoom controls (+, -, n, s).

Notes for Thematic maps menu

- Spatio-temporal data example menu correspond to a work made by Claire and need to be implemented
- Thematic maps menu remains some tasks to be done

The screenshot shows the GDI-DE website homepage. At the top right, there is a navigation bar with a British flag icon, "English | Login | Contact", and the GDI-DE logo. Below the logo is a "Linked Data" section. The main menu has several items: Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps (which is highlighted in red), and Documentation. On the left, there is a sidebar with links: "Create a thematic map", "Spatio-temporal data example", and "Thematic maps". On the right, there are two boxes: "Provider" (listing GDI-DE Geodateninfrastruktur Deutschland with the URL <https://www.gdi-de.org>) and "Contact" (listing the Coordination Office SDI Germany's address, phone number, fax number, email, and Twitter handle). At the bottom right, there is a link to "This page in [XML] [JSON]" and a small RSS feed icon.

Presentation of the Documentation menu

The screenshot shows a web browser window with the URL localhost:8080/documentation. The page is titled "Linked Data" and features the GDI-DE logo. A red navigation bar at the top includes links for Home, Data management, SPARQL endpoint, Semantic WFS, Metadata catalogue, Thematic maps, Documentation (which is highlighted), and Contact. Below the navigation bar, a section titled "Documentation" contains text about two students working from April to July 2021. It lists documents for Christopher BLARD and Pierre MAZUREK. To the right, there are two boxes: "Provider" (GDI-DE Geodateninfrastruktur Deutschland, <https://www.gdi-de.org>) and "Contact" (Coordination Office SDI Germany, with details like phone, fax, email, website, postal address, press contact, and Twitter link). At the bottom, there are links for XML and JSON, and a copyright notice.

Two students worked in the project from April to July 2021. The documentation page presents some documents they made for this internship.

Christopher BLARD

- Internship report of Christopher BLARD
- Slides for ESIREM oral internship presentation

Pierre MAZUREK

- Internship report of Pierre MAZUREK
- Slides for ESIREM oral internship presentation
- Slides for final presentation

This page in [[XML](#)] [[JSON](#)]

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Missions and tasks

- Work environment to execute the project
- Spring Build a .jar (executable)
- The .jar file is executed to build the application



Execution of the project

```
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
KnowledgeBaseInterface.java EnrichmentController.java
73     List<String> columnNames = new ArrayList<String>();
74     List<String[]> resultList = new ArrayList<String[]>();
75
76     //prefixes for SPARQL query
77     String prefixes = "PREFIX schema: <http://schema.org/>"+
78         "PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>"+
79         "PREFIX owl: <http://www.w3.org/2002/07/owl#>"+
80         "PREFIX hist: <http://wikiba.se/history/ontology#>"+
81         "PREFIX wd: <http://www.wikidata.org/entity/>"+
82         "PREFIX wdt: <http://www.wikidata.org/prop/direct/>"+
83         "PREFIX wikibase: <http://wikiba.se/ontology#>"+
84         "PREFIX dct: <http://purl.org/dc/terms/>"+
85         "PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>"+
86         "PREFIX bd: <http://www.bigdata.com/rdf#>"+
87         "PREFIX wds: <http://www.wikidata.org/entity/statement/>"+
88         "PREFIX wdv: <http://www.wikidata.org/value/>"+
89         "PREFIX p: <http://www.wikidata.org/prop/>\r\n" +
90         "PREFIX ps: <http://www.wikidata.org/prop/statement/>"+
91         "PREFIX psv: <http://www.wikidata.org/prop/statement/>"+
92         "PREFIX pq: <http://www.wikidata.org/prop/qualifier/>"+
93
94     try {
95
96         //building of the query
97         String queryString = prefixes + sq.getResults();
98         Query query = QueryFactory.create(queryString);
99         System.out.println(queryString);
100
101     } catch (Exception e) {
102         e.printStackTrace();
103     }
104
105     //add into the model attribute
106     model.addAttribute("nc", numberOfColumns);
107     model.addAttribute("cl", columnNames);
108     model.addAttribute("MDlist", resultList);
109     model.addAttribute("lc", info);
110     qexec.close();
111     return rtn;
112 }
113
114 @GetMapping("/semantic_WFS/home")
115 public String semanticWFSTHome(Model model) {
116     return "home2";
117 }
118
119 @GetMapping("/documentation")
120 public String documentationMenu(Model model) {
121     return "docu";
122 }
123
124 @GetMapping("/contact")
125 public String contactMenu(Model model) {
126     return "ctct";
127 }
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189 }
```

Problems Javadoc Declaration Console Call Hierarchy

```
[terminated] > GeoTimeWFS [Maven Build] C:\Program Files\Java\jdk-14.0.1\bin\javaw.exe (22 juil. 2021 à 15:57:07 – 15:57:40)
[INFO]
[INFO] Tests run: 17, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO]
[INFO] --- maven-jar-plugin:3.2.0:jar (default-jar) @ geotimewfs ---
[INFO] Building jar: C:\Users\Pierre\Documents\4A\GeoTimeWFS\GeoTimeWFS\target\geotimewfs-0.0.1-SNAPSHOT.jar
[INFO]
```

First approach to the project

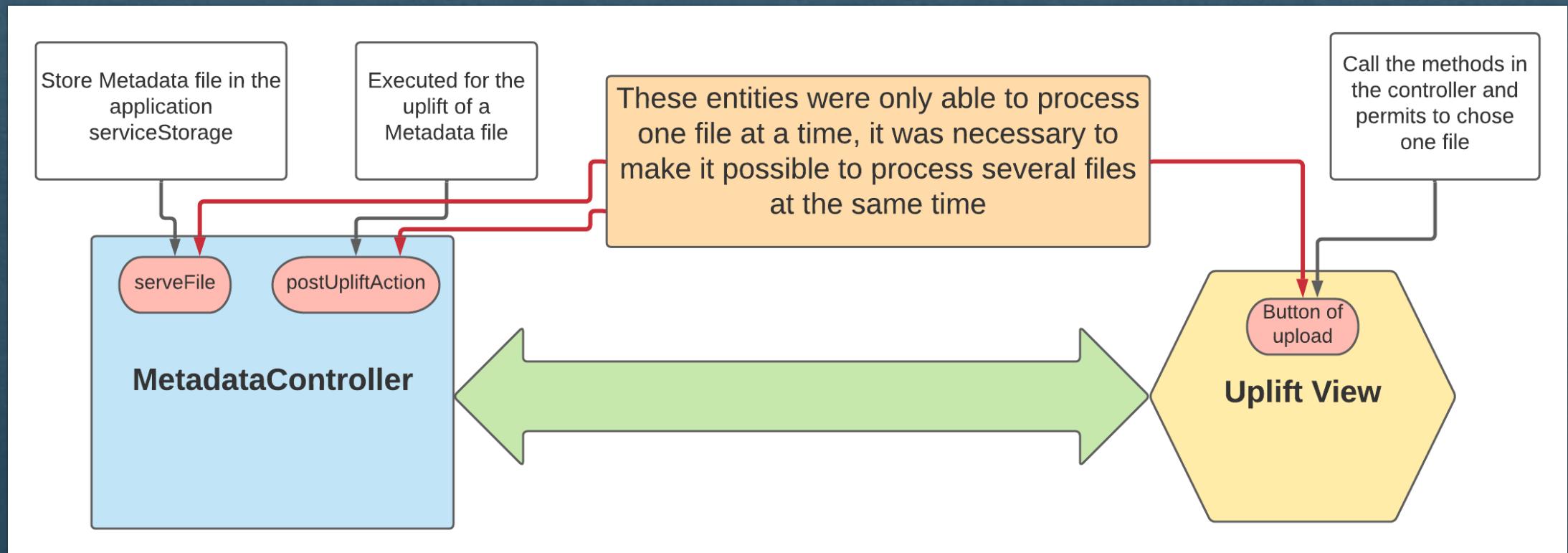
- Started by learning how does the project work
- Discovering the functioning of the project structure
- Learning of all the concepts used in the project (semantic web, metadata, ...)
- Setting up the work environment
- Learning of the concept of Model-View-Controller architecture

Tuto ontology Protégé

- Tuto for build an ontology and study all its components
- Protégé is a software made by the Stanford university which permit to manage ontologies
- It was to build an ontology about pizzas, studying object properties, reasonners, etc...

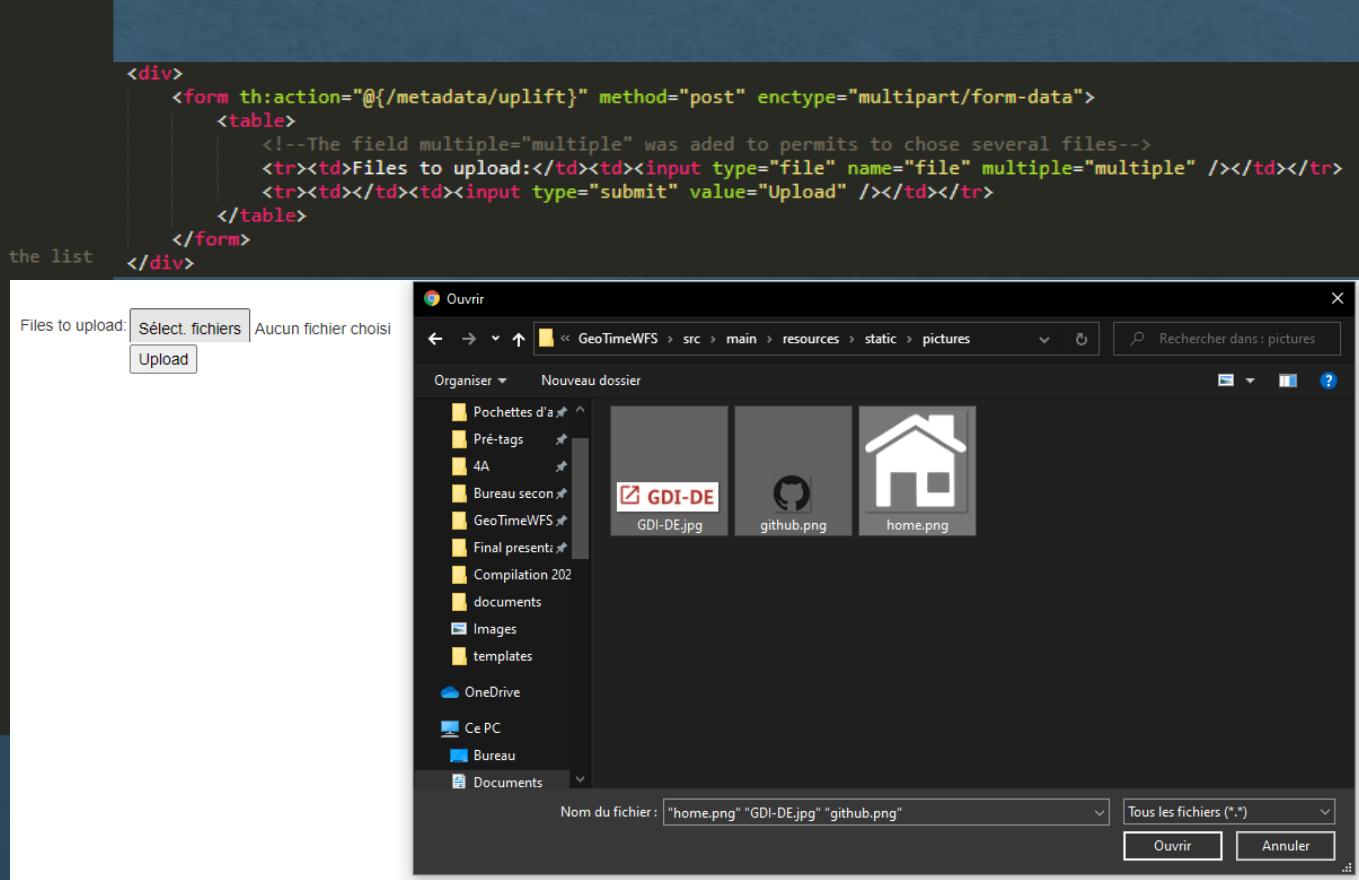


First task



First task (view, controller, display)

```
@PostMapping("/metadata/uplift")
//The input is now "List<MultipartFile>" instead of "MultipartFile"
public String postUpliftAction(@RequestParam("file") List<MultipartFile> files,
    RedirectAttributes redirectAttributes) {
    String rtn = "";
    //the for loop was aded to apply the method to all selected files
    for (int i=0; i<files.size(); i++) {
        try {
            // store file
            storageService.store(files.get(i));
            redirectAttributes.addFlashAttribute("message",
                //file is replaced by files.get(i) to indicate that the method is apply to each element of the list
                "You successfully uplift " + files.get(i) + "!");
        }
        boolean upliftOk = KB.get().uplift("upload-dir/" + files.get(i).getOriginalFilename());
        if (upliftOk) {
            int index = files.get(i).getOriginalFilename().indexOf(".");
            String fn = files.get(i).getOriginalFilename().substring(0, index);
            System.out.println(fn);
            KB.get().save();
            //return "redirect:/metadata";
            rtn = "redirect:/metadata/uplift";
        } else {
            throw new ControllerException("file format was incorrect");
        }
    } catch (OntoManagementException | ControllerException | IOException ex) {
        //TODO remove file from upload-dir
        final String message = "The uplift fails: " + ex.getMessage();
        rtn = "redirect:/error?name=" + message;
    }
}
return rtn;
```



Current application interface

The screenshot shows a web application interface with a dark blue header and a white content area. The header contains a navigation bar with links: Home, GeoTimeWFS API, Metadata, Metadata uplift, Metadata to Data, Schema upload, Schema validation, and Shapefile uplift. Below the header, a large section is titled "LandingPage: BKG WFS Service". Under this title, there is a section titled "Landingpage" which describes it as a "Testwebservice with a Triple Store backend". It lists three items: SemanticWFS API Documentation in [HTML] [YAML] [JSON], Conformance Declaration in [HTML] [XML] [JSON], and Collections Metadata in [HTML] [XML] [JSON]. Below this, it states that the homepage exposes a WFS 1.0.0, 1.1.0, 2.0.0 compatible Webservice and provides links for GetCapabilities WFS 1.0.0 [XML], GetCapabilities WFS 1.1.0 [XML], and GetCapabilities WFS 2.0.0 [XML]. At the bottom, there is a section titled "Local Options" with links to Ontology Browser, SPARQL Query Interface, Semantic WFS Configuration, and Semantic Uplift Tools.

Home GeoTimeWFS API Metadata Metadata uplift Metadata to Data Schema upload Schema validation Shapefile uplift

LandingPage: BKG WFS Service

[Landingpage](#)
Testwebservice with a Triple Store backend

- SemanticWFS API Documentation in [\[HTML\]](#) [\[YAML\]](#) [\[JSON\]](#)
- Conformance Declaration in [\[HTML\]](#) [\[XML\]](#) [\[JSON\]](#)
- Collections Metadata in [\[HTML\]](#) [\[XML\]](#) [\[JSON\]](#)

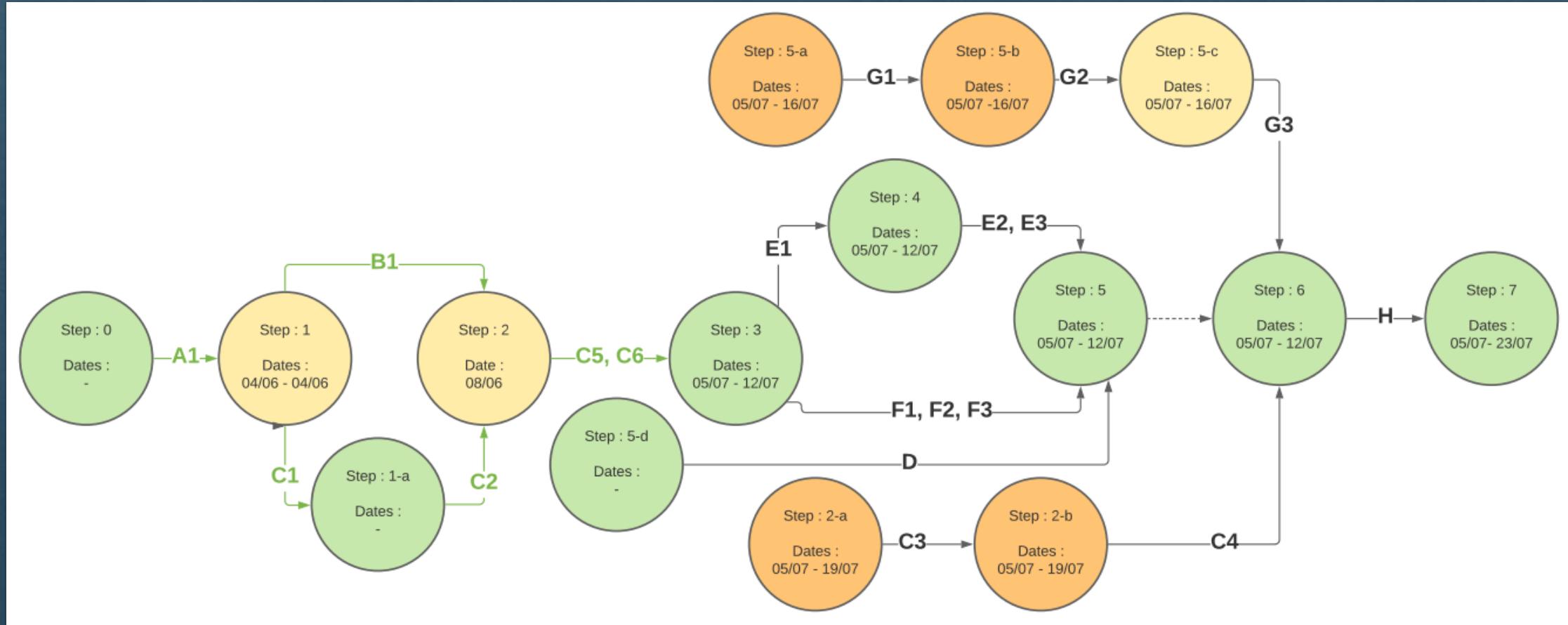
This homepage also exposes a WFS 1.0.0, 1.1.0, 2.0.0 compatible Webservice:

- GetCapabilities WFS 1.0.0 [\[XML\]](#)
- GetCapabilities WFS 1.1.0 [\[XML\]](#)
- GetCapabilities WFS 2.0.0 [\[XML\]](#)

Local Options:

- [Ontology Browser](#)
- [SPARQL Query Interface](#)
- [Semantic WFS Configuration](#)
- [Semantic Uplift Tools](#)

PERT diagram (diagram)



PERT diagram (detail of tasks)

Description	Details
Creation of permanent fields (navigation banner, titles, Provider and Contact fields, etc...)	To be created
Creation of the "HOME" menu	To be created
Creation of the "Shapefile importer" tab in the "Data management" menu	Done
Creation of the "Importer tools" tab in the "Data management" menu	Done
Creation of the "Data verification" tab in the "Data management" menu	To be created
Creation of the "Linked Data enrichment" tab in the "Data management" menu	To be created
Creation of the "Schema upload" tab in the "Data management" menu	Done
Creation of the "Schema validation" tab in the "Data management" menu	Done
Creation of the "BKG SPARQL endpoint" tab in the "SPARQL endpoint" menu	Done
Creation of the "Semantic WFS landing page" tab in the "Semantic WFS" menu	Done
Creation of the "Semantic WFS configuration" tab in the "Semantic WFS" menu	Done
Creation of the "Semantic WFS ontology browser" tab in the "Semantic WFS" menu	Done
Creation of the "Semantic OGC API Records" tab in the "Metadata Catalogue" menu	Done
Creation of the "Metadata importer" tab in the "Metadata Catalogue" menu	Done
Creation of the "Link Metadata to Data" tab in the "Metadata Catalogue" menu	Done
Creation of the "Thematic map creation" tab in the "Thematic maps" menu	To be created
Creation of the "Spatio-temporal data example" tab in the "Thematic maps" menu	To be created
Creation of the "Thematic maps" tab in the "Thematic maps" menu	To be created
Creation of the "Documentation" menu	To be created

Learning about SPARQL langage

- Langage used to make request on ontology and get results
- Used for semantic web
- Permits to make local or remote request
- Used in some website containing web semantic datas



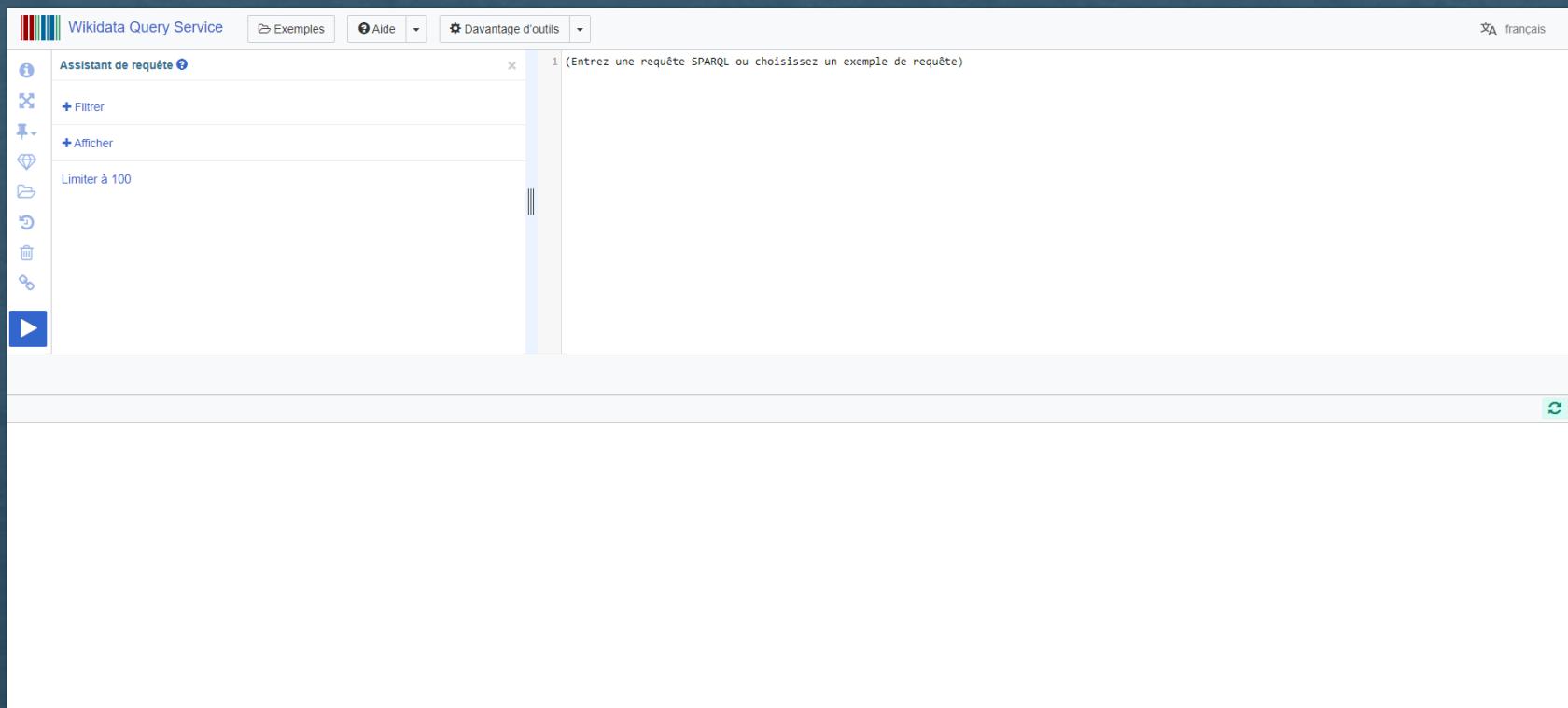
Enrichment concept

- Enrich local datas with remote datas
- Make remote SPARQL request to enrich the local datas
- Wikidata : website containing Wikipedia datas in shape of semantic
- Have a query service to make SPARQL query on it



Query Service in Wikidata

<https://query.wikidata.org/>



Example of query in Wikidata

The screenshot shows the Wikidata Query Service interface. On the left, there's a sidebar with various icons and a search bar. The main area has two panes: one for the query editor and one for the results table.

Query Editor (Left Pane):

- Assistant de requête:** Shows filters for "nature de l'élément" set to "école" and "pays" set to "Allemagne".
- Afficher:** Shows two predicates: `http://wikiba.se/ontology#geoLatitude` and `http://wikiba.se/ontology#geoLongitude`.
- Limiter à:** A dropdown menu.
- Run:** A blue play button icon.

Query (Text Area):

```
1 SELECT ?item ?itemLabel ?latitude ?longitude WHERE {
2   ?item wdt:P31 wd:Q3914.
3   ?item wdt:P17 wd:Q183.
4   ?item p:P625 ?statement .
5   ?statement psv:P625 ?coordinate_node .
6   ?coordinate_node wikibase:geolatitude ?latitude .
7   ?coordinate_node wikibase:geolongitude ?longitude .
8   SERVICE wikibase:label {
9     bd:serviceParam wikibase:language "[AUTO_LANGUAGE],de".
10  }
11 }
```

Results (Right Pane):

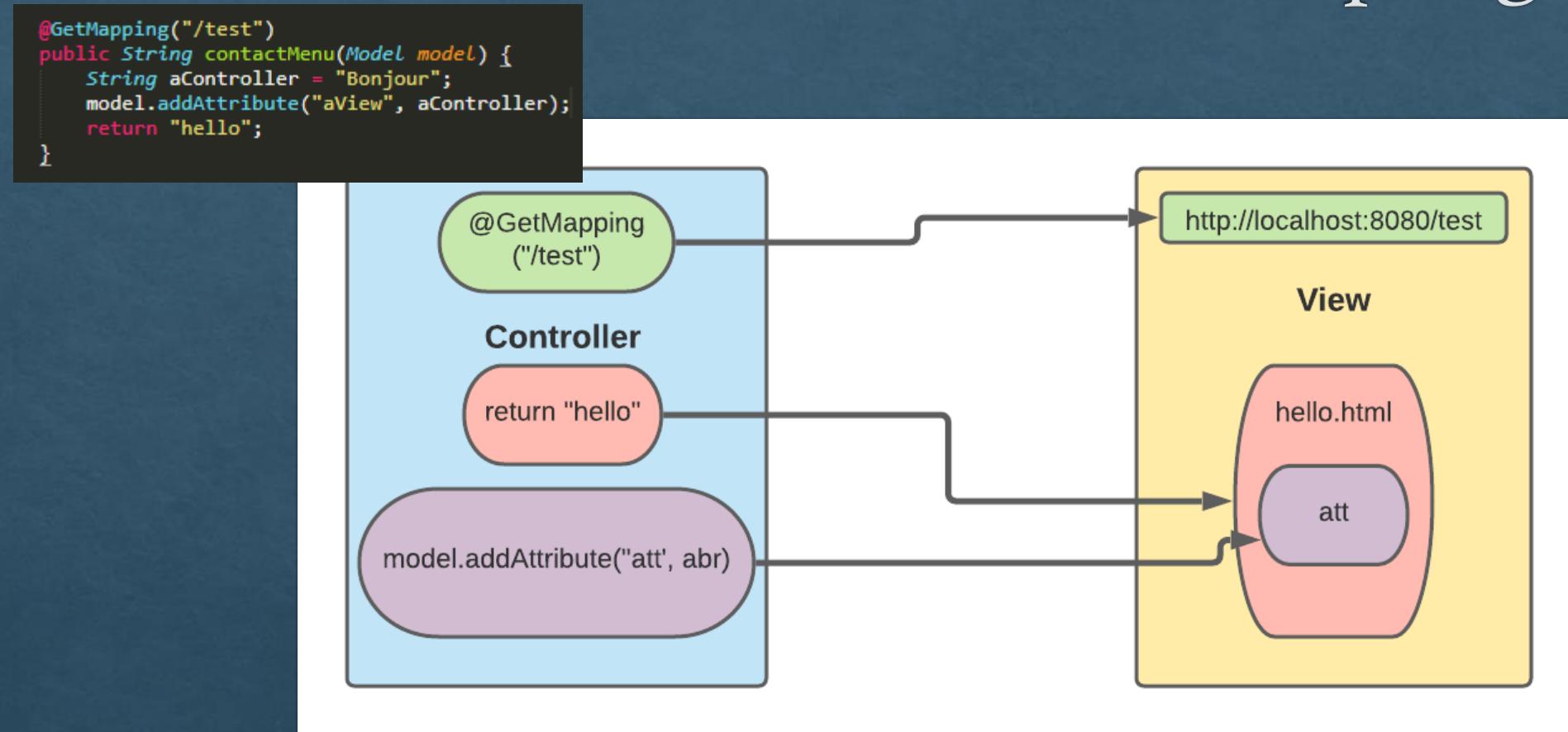
item	itemLabel	latitude	longitude
wd:Q1078663	Christian-Gottfried-Ehrenberg-Gymnasium	51.5253	12.3349
wd:Q1082521	Christian von Mannlich-Gymnasium	49.3204	7.3349
wd:Q1203111	Deutsche Heimschule Schloß Iburg	52.1579	8.04181
wd:Q1201767	Deutsch-Französisches Bildungszentrum Leipzig	51.3261	12.3856
wd:Q1042478	Carlo Schmid Schule Pforzheim	48.8833	8.69573
wd:Q1109249	Collegium Ludgerianum	51.9625	7.62363

At the bottom right of the results pane, it says "3044 résultats en 2951 ms".

Explanation of the example

```
SELECT ?item ?itemLabel ?latitude ?longitude WHERE {
    ?item wdt:P31 wd:Q3914. #Nature of the element = School
    ?item wdt:P17 wd:Q183. #Country = Germany
    ?item p:P625 ?statement . #define ?statement as geographical coordinates
    ?statement psv:P625 ?coordinate_node . #define ?statement as a ?coordinate_node
    ?coordinate_node wikibase:geoLatitude ?latitude . #?coordinate_node is composed by latitude
    ?coordinate_node wikibase:geoLongitude ?longitude . #?coordinate_node is composed by longitude
    SERVICE wikibase:label {
        bd:serviceParam wikibase:language "[AUTO_LANGUAGE],de". #priority langage is German, elsewhere the langage is auto (English)
    }
}
```

Link of Controller and View with Spring Boot



TestSPARQLController.java (1)

```
//the url we want to associate is "https://localhost:8080/test/SPARQL"
@GetMapping("/test/SPARQL")
public String getSPARQLRequest(Model model) throws OntoManagementException {
    //the name of the view associated is "testSPARQL.html"
    String rtn="testSPARQL";

    //prefixes for SPARQL query
    String prefixes = "PREFIX schema: <http://schema.org/>" +
        "PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>" +
        "PREFIX owl: <http://www.w3.org/2002/07/owl#>" +
        "PREFIX hist: <http://wikiba.se/history/ontology#>" +
        "PREFIX wd: <http://www.wikidata.org/entity/>" +
        "PREFIX wdt: <http://www.wikidata.org/prop/direct/>" +
        "PREFIX wikibase: <http://wikiba.se/ontology#>" +
        "PREFIX dct: <http://purl.org/dc/terms/>" +
        "PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>" +
        "PREFIX bd: <http://www.bigdata.com/rdf#>" +
        "PREFIX wds: <http://www.wikidata.org/entity/statement/>\r\n" +
        "PREFIX wdv: <http://www.wikidata.org/value/>" +
        "PREFIX p: <http://www.wikidata.org/prop/>\r\n" +
        "PREFIX ps: <http://www.wikidata.org/prop/statement/>\r\n" +
        "PREFIX pq: <http://www.wikidata.org/prop/qualifier/>";

    //content of the query
    String queryContent = "SELECT ?city ?cityLabel ?population WHERE {\r\n" +
        "    SERVICE wikibase:label { bd:serviceParam wikibase:language \"[AUTO_LANGUAGE],en\". }\r\n" +
        "    VALUES ?town_or_city {\r\n" +
        "        wd:Q515\r\n" +
        "    }\r\n" +
        "    ?city (wdt:P31/(wdt:P279*)) ?town_or_city;\r\n" +
        "        wdt:P17 wd:Q183.\r\n" +
        "    OPTIONAL { ?city wdt:P1082 ?population. }\r\n" +
        "}\r\n" +
        "LIMIT 10";
    //build of the query with prefixes and the content of the query
    String queryString = prefixes + queryContent;
    //Create a query type with the String 'queryString'
    Query query = QueryFactory.create(queryString);
    //Print the query in console to ensure that it works
    System.out.println(queryString);
```

```
//execute the query with the endpoint of Wikidata
QueryExecution qexec = QueryExecutionFactory.sparqlService("https://query.wikidata.org/sparql", query);
//store results in ResultSet format
ResultSet results = qexec.execSelect();
//gives the column names of the query
List<String> columnNames = results.getResultVars();
System.out.println("Column Names : "+ columnNames);

//return the number of column of the results
List<Integer> numberOfColumns = new ArrayList<Integer>();
for (int i=0; i<columnNames.size(); i++) {
    numberOfColumns.add(i);
}
System.out.println(numberOfColumns);
//the empty list that will contain all the results
List<String[]> resultList = new ArrayList<String[]>();

//for all the QuerySolution in the ResultSet file
while (results.hasNext()) {
    //the QuerySolution is find on the ResultSet file
    QuerySolution solu = results.next();
    //empty array that have the size of the number of columns
    String[] ls=new String[columnNames.size()];
    //for all the column in the results
    for (int i=0; i<columnNames.size(); i++) {
        //the name of the column
        String columnName = columnNames.get(i);
        //the node is the result corresponding to the current column in the current QuerySolution
        RDFNode node = solu.get(columnName);
        String a = null;

        //test if the node is a resource type
        if(node.isResource()){
            //a is equal to the Local Name (String)
            a = node.asResource().getLocalName();
        }
        //test if literal
        if(node.isLiteral()) {
            //a is in String type
            a = node.asLiteral().toString();
        }
    }
}
```

TestSPARQLController.java (2), testSPARQL.html and testSPARQL.css

```

for (int i=0; i<columnNames.size(); i++) {
    //the name of the column
    String columnName = columnNames.get(i);
    //the node is the result corresponding to the current column in the current QuerySolution
    RDFNode node = soln.get(columnName);
    String a = null;

    //test if the node is a resource type
    if(node.isResource()){
        //a is equal to the Local Name (String)
        a = node.asResource().getLocalName();
    }
    //test if literal
    if(node.isLiteral()) {
        //a is in String type
        a = node.asLiteral().toString();
    }
    //remove characters contains in the latitude and longitude fields
    if(a.contains("^^http://www.w3.org/2001/XMLSchema#decimal")) {
        a = a.replace("^^http://www.w3.org/2001/XMLSchema#decimal", "");
    }
    //remove characters contains in the itemLabel field
    if(a.contains("@en")){
        a = a.replace("@en", "");
    }
    //add the node to the list
    ls[i]=a;
}
//force a String[] content and add into resultList
Arrays.deepToString(ls);
//add the list corresponding to a QuerySolution in the list of results
resultList.add(ls);
}

//add into the model attribute

model.addAttribute("nc", numberOfColumns);
model.addAttribute("cl", columnNames);
model.addAttribute("MDlist", resultList);
qexec.close();
return rtn;

```

testSPARQL.html

```

<div class="tableContentSPARQL">
    <!--Creation of the table containing the results-->
    <table border="1">
        <thead>
            <!--Title of the table-->
            <tr><th colspan="3">Remote SPARQL request</th></tr>
            <tr>
                <!--Display the name of column corresponding the correct number-->
                <th><span th:text="${cl[0]}></span></th>
                <th><span th:text="${cl[1]}></span></th>
                <th><span th:text="${cl[2]}></span></th>
            </tr>
        </thead>
        <tbody>
            <!--For each element contained md in MDlist-->
            <tr th:each="md: ${MDlist}">
                <!--Print the three element in md with the correct column number-->
                <td style="width: 170px;"><span th:text="${md[0]}></span></td>
                <td style="width: 170px;"><span th:text="${md[1]}></span></td>
                <td style="width: 170px;"><span th:text="${md[2]}></span></td>
            </tr>
        </tbody>
    </table>
</div>

```

testSPARQL.css

```

.tableContentSPARQL{
    font-weight: bold;
    text-align: center;
    font-size: 1.2em;
}

.tableContentSPARQL th {
    width: 170px;
}

.tableContentSPARQL th:hover{
    background-color: #000000;
    color: white;
}

.tableContentSPARQL td:hover{
    background-color: #383434;
    color: white;
}

caption.tableContentSPARQL{
    caption-side: top;
}

```

Displaying of testSPARQL.html

Remote SPARQL request		
city	cityLabel	population
Q14900	Haltern am See	38013
Q14914	Coesfeld	36217
Q14925	Mühlhausen	36200
Q14945	Merseburg	34080
Q14946	Billerbeck	11566
Q15977	Meppen	35373
Q15986	Naumburg (Saale)	32402
Q15989	Uelzen	33614
Q16024	Geldern	33836
Q16107	Höxter	28824

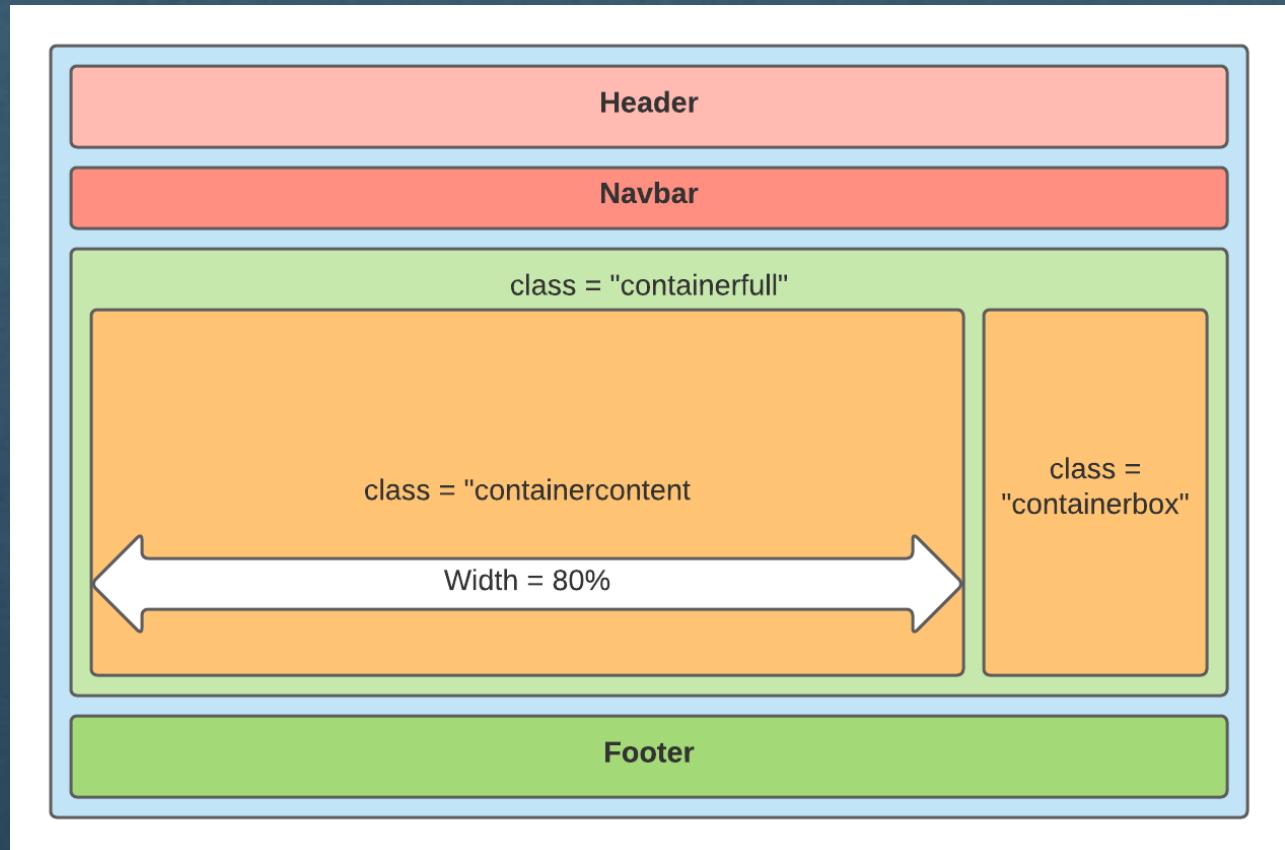
Query explanation

```
SELECT ?city ?cityLabel ?population WHERE {
    SERVICE wikibase:label { #priority langage is English
        bd:serviceParam wikibase:language "[AUTO_LANGUAGE],en".
    }
    VALUES ?town_or_city {
        wd:Q515 #?town_or_city corresponding to city
    }
    #nature of the element ?city corresponding to ?town_or_city
    ?city (wdt:P31/(wdt:P279*)) ?town_or_city;
    wdt:P17 wd:Q183. #Country = Germany
    OPTIONAL {
        ?city wdt:P1082 ?population. #contains if it exists the property population
    }
}
LIMIT 10
```

- Problem with the method : it can only display a given number of columns (here 3)

Style work

- Creation of a navbar with possibility to display dinamically submenus
- Creation of the header with correct fields
- Creation of Provider and Contact boxes that are displayed aside the webpage
- Creation of a footer

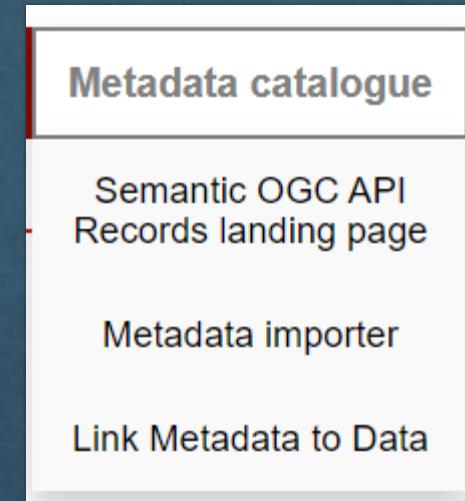


Creation of the new navbar

```
<html>
<head>
</head>
<body>
    <div th:fragment="navbar" >
        <div id="topnavbar" class="topnav">
            <div id="innernavBar">
                <div>
                    <link rel="stylesheet" type="text/css" href="/css/navbar.css">
                    <!--Home menu-->
                    <div class="dropdown">
                        <button class="dropbtn" onclick="window.location.href = 'http://localhost:8080/home';">Home</button>
                    </div>
                    <!--Data management menu with 5 submenus-->
                    <div class="dropdown">
                        <!--Button corresponding to menu which have submenu,
                            when the cursor pass in this button, it displays the submenus-->
                        <button class="dropbtn">Data management</button>
                        <div class="dropdown-content">
                            <!--The Submenus with their url-->
                            <a href="http://localhost:8080/data/ShpUplift">Shapefile importer</a>
                            <a href="https://www.i3mainz.de/projekte/bkg/importer/">Other importers</a>
                            <a href="http://localhost:8080/enrichment/">Linked Data enrichment</a>
                            <a href="http://localhost:8080/schema/upload">Schema upload</a>
                            <a href="http://localhost:8080/schema/validation">Schema verification</a>
                        </div>
                    </div>
                    <!--SPARQL endpoint menu (external link)-->
                    <div class="dropdown">
                        <!--The button for a menu without subemnus
                            the button have a function in JavaScript that gives to it a url that is reached when the button is clicked-->
                        <button class="dropbtn" onclick="window.location.href = 'https://www.i3mainz.de/projekte/bkg/semanticwfs/config/queryinterface.html';">SPARQL
                            endpoint</button>
                    </div>
                </div>
            </div>
        </div>
    </div>
</body>
</html>
```

Creation of the new navbar

```
.dropbtn {  
    display: inline-block;  
    border: 2px solid gray;  
    position: relative;  
    background-color: #870909;  
    color: #fffffb6;  
    text-align: center;  
    padding: 16px;  
    text-decoration: none;  
    font-size: 1.4em;  
    font-weight: bold;  
}  
  
.dropbtn:hover {  
    background-color: white;  
    color: gray;  
    box-shadow: 0px 8px 16px 0px rgba(0,0,0,0.2);  
}  
  
.btn {  
    display: inline-block;  
    border: 2px solid gray;  
    position: relative;  
    background-color: #870909;  
    color: #fffffb6;  
    text-align: center;  
    padding: 16px;  
    text-decoration: none;  
    font-size: 1.4em;  
    font-weight: bold;  
}  
  
.dropdown {  
    position: relative;  
    display: inline-block;  
}  
  
.dropdown-content {  
    display: none;  
    position: absolute;  
    background-color: #f9f9f9;  
    box-shadow: 0px 8px 16px 0px rgba(0,0,0,0.2);  
    z-index: 1;  
    min-width: 130px;  
}  
  
.dropdown-content a {  
    color: black;  
    padding: 16px;  
    text-decoration: none;  
    display: block;  
    font-size: 1.3em;  
    text-align: center;  
    position: relative;  
}  
  
.dropdown-content a:hover {  
    background-color: #870909;  
    color: white;  
    font-size: 1.3em;  
    text-align: center;  
}  
  
.dropdown:hover .dropdown-content {  
    display: block;  
}  
  
.dropdown:hover .dropbtn .btn {  
    background-color: white;  
    color: gray;  
}
```



Creation of a header



English | Login | Contact

Linked Data



Header in a .html file

```
<!--Header with the picture, title and Contact-->

<div class="containerfull">
  <a href="http://localhost:8080/home"></a>
  <span class="titleOfHeader">Linked Data</span>
  <span class="textOfHeader">
    English | <a href="http://localhost:8080/login" style="text-decoration: none; color: #333333;">Login</a> | <a href="http://localhost:8080/contact" style="text-decoration: none; color: #333333;">Contact</a><br><br>
    <a href="https://www.gdi-de.org" target="_blank"></a></span>
  </div>

  <!-- Navigation bar and page title -->

  <header id="header">
    <div th:insert="fragments/nav :: navbar"></div>
  </header>
```

headerStyle.css

```
.pictureOfHeader{
  width: 180px;
  margin-left: 55px;
  margin-top: 4px;
  margin-bottom: 24px;
}

.titleOfHeader{
  text-align: center;
  font-weight: bold;
  font-size: 2.8em;
  margin: auto;
}

.textOfHeader{
  width: 20%;
  font-size: 1.8em;
}

.containerfull {
  display: flex;
  margin: 0px;
  padding: 0px;
}
```

MAZUREK Pierre - BLARD Christopher - final presentation of GeoTimeWFS internship

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Creation of Provider and Contact boxes (1)

```
<!--"Provider" and "Contact" boxes-->
<div class="containerbox">
  <div class="box">
    <div class="titlebox">
      <span> Provider</span>
    </div>
    <div class="normalfont">
      <br><span class="boldfont"> GDI-DE Geodateninfrastruktur Deutschland</span>
      <span><a href="https://www.gdi-de.org/" target="_blank" style="color: #007F7F; text-decoration: none;"> https://www.gdi-de.org</a></span><br>
      <br>
    </div>
  </div>
  <div class="box">
    <div class="titlebox">
      <span> Contact</span>
    </div>
    <div class="normalfont">
      <br><span class="boldfont"> Coordination Office SDI Germany:</span><br>
      Telefon: 069 6333-258<br>
      Telefax: 069 6333-446<br>
      <a href="mailto:mail@gdi-de.org" style="color: #000000; text-decoration: none;"> mail@gdi-de.org</a><br>
      <a href="https://www.gdi-de.org" target="_blank" style="color: #000000; text-decoration: none;"> www.gdi-de.org</a><br><br>
      <span class="boldfont"> Postal address:</span><br>
      Coordination Office SDI Germany<br>
      Federal Office for Cartography and Geodesy<br>
      Richard-Strauss-Avenue 11<br>
      60598 Frankfurt am Main, Germany<br><br>
      <span class="boldfont"> Press contact:</span> <a href="mailto:pressekontakt@gdi-de.org" target="_blank" style="color: #000000; text-decoration: none;"> pressekontakt@gdi-de.org</a> <br><br>
      <span class="boldfont"> Twitter:</span> <a href="https://twitter.com/gdi_de" target="_blank" style="color: #000000; text-decoration: none;"> www.twitter.com/gdi_de</a> <br><br>
    </div>
  </div>
</div>
```

Creation of Provider and Contact boxes (2)

asideBox.css

```
.containerfull {  
    display: flex;  
    margin: 0px;  
    padding: 0px;  
}  
.containercontent {  
    padding: 10px;  
    width: 80%;  
}  
.containerbox {  
    display: flex;  
    align-items: right;  
    flex-direction: column;  
    padding-right: 0px;  
    margin-right: 0px;  
}  
.box {  
    border: 1px solid black;  
    width: 300px;  
    margin: 10px;  
    margin-right: 0px;  
}  
.titlebox {  
    width: 100%;  
    border: 2px solid gray;  
    padding: 10px;  
    background-color: lightgray;  
    text-align: left;  
    font-family: "Proxima Nova Condensed Bold", "Source Sans Pro", sans-serif;  
    font-size: 1.4em;  
    font-weight: bold;  
}  
.boldfont {  
    margin-bottom: 20px;  
    font-family: "Source Sans Pro", sans-serif;  
    font-weight: bold;  
}  
.normalfont {  
    font-family: "Source Sans Pro", sans-serif;  
    font-size: 0.9em;  
}
```



The screenshot shows two rectangular boxes side-by-side. The top box is titled 'Provider' and contains the text 'GDI-DE Geodateninfrastruktur Deutschland' and a link 'https://www.gdi-de.org'. The bottom box is titled 'Contact' and contains sections for 'Coordination Office SDI Germany' (with phone and fax numbers, email, and website), 'Postal address' (with address details), and 'Press contact' (with an email address). Both boxes have a light gray header bar and a white body area.

Provider

GDI-DE Geodateninfrastruktur Deutschland
<https://www.gdi-de.org>

Contact

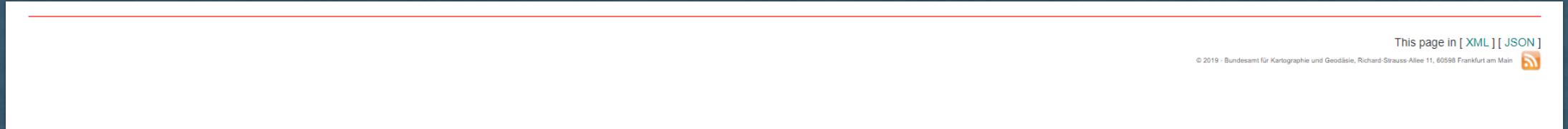
Coordination Office SDI Germany:
Telefon: 069 6333-258
Telefax: 069 6333-446
mail@gdi-de.org
www.gdi-de.org

Postal address:
Coordination Office SDI Germany
Federal Office for Cartography and Geodesy
Richard-Strauss-Avenue 11
60598 Frankfurt am Main, Germany

Press contact: pressekontakt@gdi-de.org

Twitter: www.twitter.com/gdi_de

Creation of a footer



Footer in a .html file

```
<!--The footer of the application-->
<footer>
  <hr style="height: 1px; background-color: #FF0000">
  <div style="float: right;">
    <span class="footerpage">This page in [ <span style="color: #007F7F">XML</span> ] [<span style="color: #007F7F"> JSON </span>] </span><br>
    <span class="footertext">© 2019 - Bundesamt für Kartographie und Geodäsie, Richard-Strauss-Allee 11, 60598 Frankfurt am Main</span>
  </div>
</footer>
```

footerStyle.css

```
.footertext{
  font-family: "Source Sans Pro", sans-serif;
  font-size: 0.6em;
  float: right;
}

.footerpage {
  font-family: "Source Sans Pro", sans-serif;
  float: right;
}
```

Thematic maps

- Use of the library JavaScript Leaflet
- Leaflet is about cartography and permits to generate and manage maps
- It is used on the OpenSource project OpenStreetMap
- There are several possible views : Street maps and Grayscale maps



Creation of a map

```
<!-- Definition of the map -->
<div id=map style="position : relative; width: 0px; height: 0px;">

    <!-- Leaflet script and stylesheet -->
    <script src="https://unpkg.com/leaflet@1.7.1/dist/leaflet.js" integrity="sha512-XQoYMcMTK8LvdXYG3nZ448h0EQiglfqkJs1NOQV44cWnUrBc8PkAOcXy20w0vlaXaUearIOBhiXZ5V3ynxwA==" crossorigin=""></script>
    <link rel="stylesheet" href="https://unpkg.com/leaflet@1.7.1/dist/leaflet.css" integrity="sha512-xodZBNTC5n17Xt2atTPuE1HxjVMSvLVw9ocqUKLsCC5XdbqCmblAshOMAS6/keqq/sMZM19scR4PsZChSR7A==" crossorigin="" />

    <script>
        var mbAttr = 'Map data © <a href="https://www.openstreetmap.org/copyright">OpenStreetMap</a> contributors, ' +
            'Imagery © <a href="https://www.mapbox.com/">Mapbox</a>',
            mbUrl = 'https://api.mapbox.com/styles/
                v1/{id}/tiles/{z}/{x}/{y}?access_token=pk.eyJ1IjoibWFwYm94IiwiYSI6ImNpejY4NXVycTA2emYycXBndHRqcmZ3N3gifQ.rJcFIG214AriISLbB6B5aw';
        // Creation of two layers : grayscale, and streets map
        // It is also possible to add a satellite map, landform map, ...
        var grayscale = L.tileLayer(mbUrl, {id: 'mapbox/light-v9', tileSize: 512, zoomOffset: -1, attribution: mbAttr}),
            streets = L.tileLayer(mbUrl, {id: 'mapbox/streets-v11', tileSize: 512, zoomOffset: -1, attribution: mbAttr});
        // Definition of the map, and setup of details : coordinates of the center, zoom level and layers that appear on loading
        var map = L.map('map', {
            center: [49.99, 8.24],
            zoom: 10,
            layers: [Grayscale]
        });
        // Definition of layers
        var baseLayers = {
            "Grayscale": grayscale,
            "Streets": streets
        };
        // Definition of point layers
        var overlays = {};
        // Add layers and points layers to the map
        L.control.layers(baseLayers, overlays).addTo(map);
    </script>
</div>
```

Grayscale/Streets view



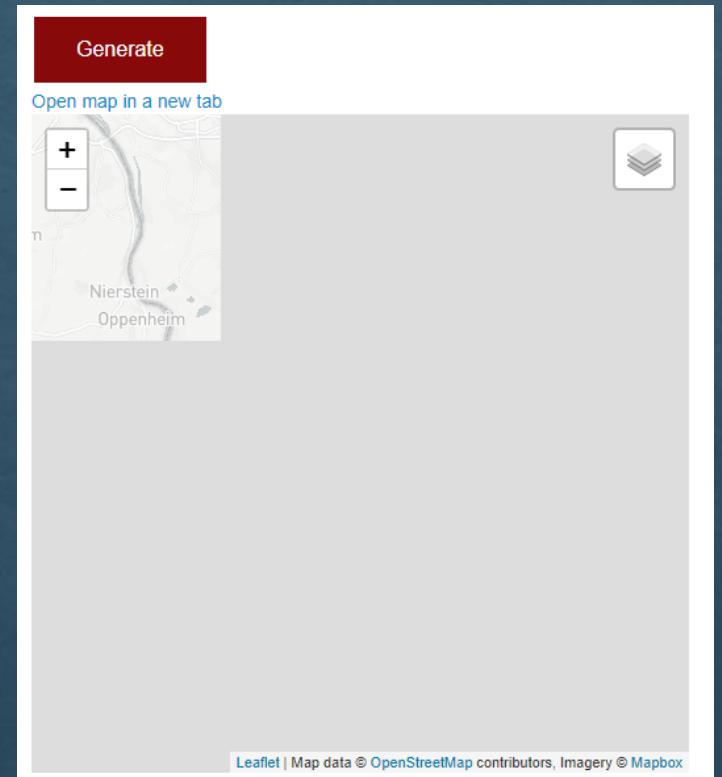
Problem with css

- It needs a remote css file to generate the maps
- This css was to big (3000 lines) and there were conflicts with the div in html
- The solution was to give fixed values to the div directly on the html

```
<!-- Definition of the map -->
<div id=map style="position : relative; width: 0px; height: 0px;">
:
```

Leaflet resizing problem

- On the load of thematic map, div containing the map has the size of 0x0px
- When we click on generate, the map is supposed to appear in 500x500px
- Leaflet has big trouble to display when the map is resized



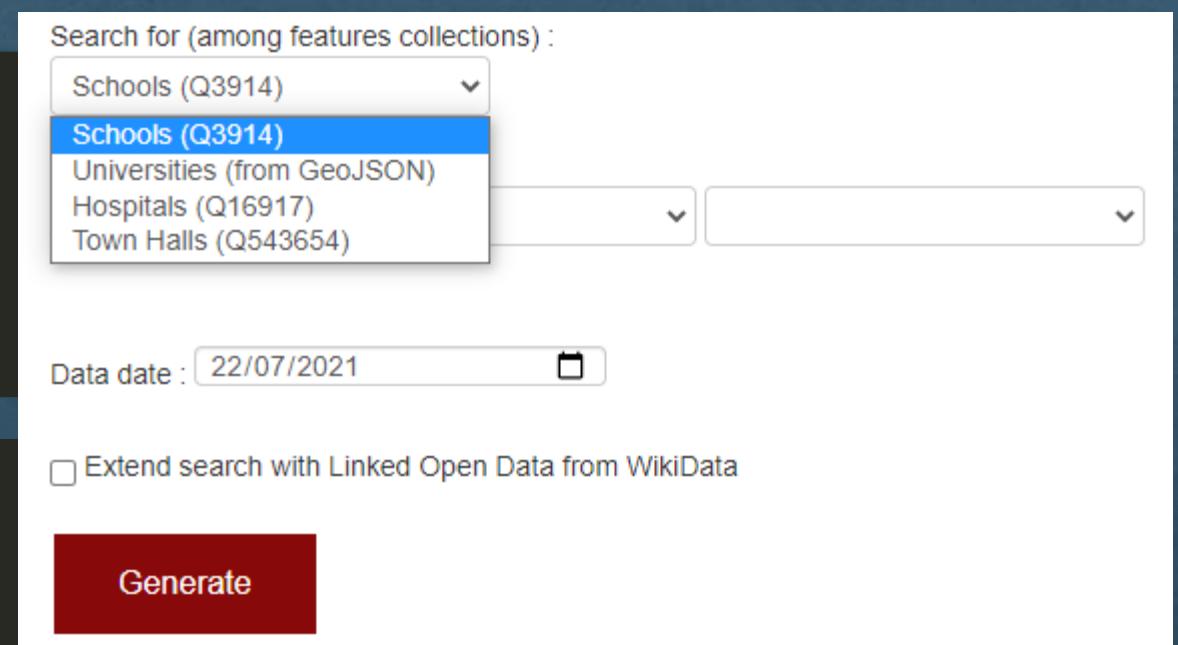
Example of thematic maps (Creation of thematic maps menu)

mapCreation.html

```
<!-- List of feature collections -->
<label for="list"> Search for (among features collections) : <list>
  <br>
  <select name="list" id="list">
    <option value="schools">Schools (Q3914)</option>
    <option value="universities">Universities (from GeoJSON)</option>
    <option value="hospitals">Hospitals (Q16917)</option>
    <option value="townhalls">Town Halls (Q543654)</option>
  </select>
</list>
</label>

<script>
  // Definition of links
  const maps = {
    schools: 'mapCreation/schools',
    universities: 'mapCreation/universities',
    townhalls: 'mapCreation/townhalls',
    hospitals: 'mapCreation/hospitals'
  }

  // Listener to click on "Open map in a new tab" button
  document.getElementById('mapButton').addEventListener('click', () => window.open(maps[document.getElementById('list').value], '_blank'));
</script>
```



Schools.html (1)

```
<html>
  <head>
    <title>Schools</title>
    <!--.css and .js files used by Leaflet-->
    <link rel="stylesheet" href="https://unpkg.com/leaflet@1.7.1/dist/leaflet.css" integrity="sha512-xodZBNTC5n17Xt2atTPuE1HxjVMSvLVW9ocqUKLsCC5CXdbqCmblAshOMAS6/keqq/sMZMZ19scR4PsZChSR7A==" crossorigin="" />
    <script src="https://unpkg.com/leaflet@1.7.1/dist/leaflet.js" integrity="sha512-XQoYMqMTK8LvdxXYG3nZ448h0EQiglfqkJs1NOQV44cWnUrBc8PkAOcXy20w0vlaXaVUearIOBhiXZ5V3ynxwA==" crossorigin=""></script>
    <script src="https://cdnjs.cloudflare.com/ajax/libs/leaflet-ajax/2.1.0/leaflet.ajax.min.js"></script>
    <script src="hs.js"></script>
    <link href="https://fonts.googleapis.com/css?family=Lato|Roboto|Source+Code+Pro" rel="stylesheet">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/highlight.js/9.15.6/styles/monokai.min.css">
    <!--style of element (equivalent to a .css file)-->
    <style>
      html, body {
        height: 100%;
        margin: 0;
      }
      #map {
        width: 100%;
        height: 100%;
      }
    </style>
  </head>
  <body>
    <!--.js file used for map creation-->
    <script src="http://code.jquery.com/jquery-3.3.1.slim.js" integrity="sha256-fNXJFlca05BIO2Y5zh1xrShK3ME+/lYZ0j+ChX2DA==" crossorigin="anonymous"></script>
    <script src="https://cdnjs.cloudflare.com/ajax/libs/jquery-csv/1.0.21/jquery.csv.js"></script>
    <script src="https://cdnjs.cloudflare.com/ajax/libs/highlight.js/9.15.6/highlight.min.js"></script>
```

Schools.html (2)

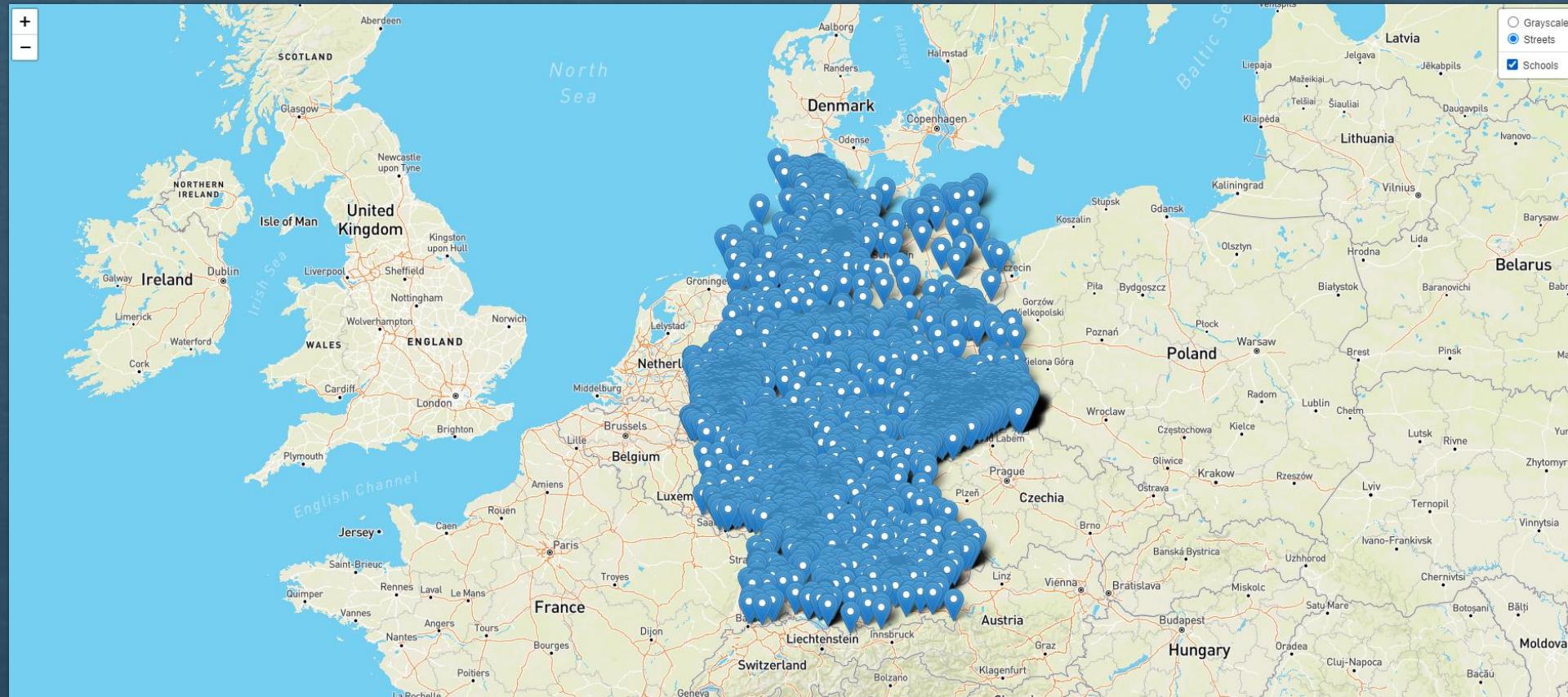
```
<div id='map'>
  <script>
    //initialise the map
    hljs.initHighlightingOnLoad();
    $(document).ready(() => {
      parse();
    });
    //run the creation of the map by a click
    $('#run').bind('click', function () {
      parse();
    });
    //create a new layer on the map
    var schools = new L.layerGroup();
    //the function classify datas and fill the input field to add to the map
    function parse() {
      const input = $('#input').val();
      const data = $.csv.toArrays(input);
      for(let i=0; i<data.length; i++){
        L.marker([data[i][3], data[i][4]]).bindPopup(data[i][1]).addTo(schools);
      }
    }
    //generate the style of the map
    var mbAttr = 'Map data &copy; <a href="https://www.openstreetmap.org/copyright">OpenStreetMap</a> contributors, ' +
    'Imagery &copy; <a href="https://www.mapbox.com/">Mapbox</a>',
    mbUrl = 'https://api.mapbox.com/styles/
      v1/{id}/tiles/{z}/{x}/{y}?access_token=pk.eyJ1IjoibWFwYm94IiwidjIwMpejY4NXVycTA2emYycXBndHRqcmZ3N3gifQ.rJcFIG214AriISLbB6B5aw';
    //grayscale or street view of the map
    var grayscale = L.tileLayer(mbUrl, {id: 'mapbox/light-v9', tileSize: 512, zoomOffset: -1, attribution: mbAttr}),
    streets = L.tileLayer(mbUrl, {id: 'mapbox/streets-v11', tileSize: 512, zoomOffset: -1, attribution: mbAttr});
    //focus the map on Germany
    var map = L.map('map', {
      center: [52, 9],
      zoom: 6,
      layers: [grayscale, streets]
    });

```

Schools.html (3)

```
//define the two view possibilities
var baseLayers = {
  "Grayscale": grayscale,
  "Streets": streets
};
//define the name of the data list
var overlays = {
  "Schools": schools
};
//add these entities to the map to fill it
L.control.layers(baseLayers, overlays).addTo(map);
</script>
</div>
</body>
<!--Data for schools that are added to the map--&gt;
&lt;textarea id="input"&gt;http://www.wikidata.org/entity/Q104679988,Q104679988,Point(9.009105563 48.697723553),48.697723553472,9.0091055631638,
http://www.wikidata.org/entity/Q105549181,Q105549181,Point(8.720864653 48.720930932),48.720930932341,8.7208646535873,
http://www.wikidata.org/entity/Q105694576,Q105694576,Point(8.7819 52.1378),52.1378,8.7819,
http://www.wikidata.org/entity/Q105696854,Q105696854,Point(13.357404371 52.490743096),52.490743096078,13.357404371178,
http://www.wikidata.org/entity/Q11322490,Q11322490,Point(9.50475 48.01922222),48.01922222,9.50475,
http://www.wikidata.org/entity/Q15260244,Q15260244,Point(11.60027778 48.09416667),48.09416667,11.60027778,
http://www.wikidata.org/entity/Q16323639,Q16323639,Point(9.53576 54.50381),54.50381,9.53576,
http://www.wikidata.org/entity/Q16938854,Q16938854,Point(13.1466298 52.4141452),52.4141452,13.1466298,
http://www.wikidata.org/entity/Q16964317,Q16964317,Point(8.6305 50.1317),50.1317,8.6305,
http://www.wikidata.org/entity/Q16987950,Q16987950,Point(6.74017 51.23665),51.23665,6.74017,
http://www.wikidata.org/entity/Q17086461,Q17086461,Point(8.6621 49.4087),49.4087,8.6621,
http://www.wikidata.org/entity/Q25035948,Q25035948,Point(8.389558 49.02581),49.02581,8.389558,
http://www.wikidata.org/entity/Q4719455,Q4719455,Point(9.075442 48.735331),48.735331,9.075442,
http://www.wikidata.org/entity/Q4892397,Q4892397,Point(13.222 52.401),52.401,13.222,
http://www.wikidata.org/entity/Q5490842,Q5490842,Point(8.665144 50.130077),50.130077,8.665144,
http://www.wikidata.org/entity/Q55886923,Q55886923,Point(7.132397 50.685222),50.685222,7.132397,
http://www.wikidata.org/entity/Q5698666,Q5698666,Point(8.6834 49.3908),49.3908,8.6834,
http://www.wikidata.org/entity/Q63617228,Q63617228,Point(12.056962 54.125239),54.125239,12.056962,
http://www.wikidata.org/entity/Q65718593,Q65718593,Point(9.96665 53.56248),53.56248,9.96665,
http://www.wikidata.org/entity/Q65964259,Q65964259,Point(8.9659 54.6196),54.6196,8.9659</pre>
```

Display of schools in the map



Display map from GeoJSON files

- Leaflet offers a functionnality to add directly a GeoJSON variable with this command
- However, it is not possible to click on a point to display its name
- Solution : make a loop to print point by point on the map

```
L.geoJSON(hs).addTo(universities);
```

```
// To add a point :  
L.marker([latitude, longitude]).bindPopup(nameOfThePoint).addTo(nameOfTheLayer);
```

Displaying of the GeoJSON file from BKG

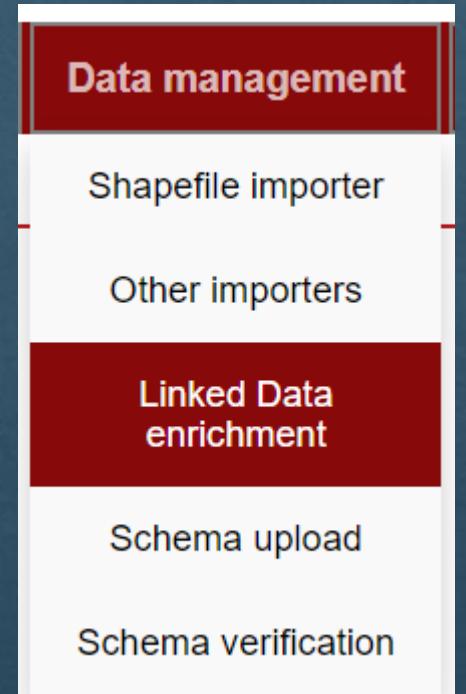


Tasks remaining concerning thematic maps

- Complete shapefile processing algorithm missing
- "Spatio-temporal data example" page not integrated
- List of uncreated thematic maps (because of the resizing problem, with the possible solution is to put screenshots of the maps instead of enlarging maps)
- Documentation not integrated

The Linked Data enrichment view

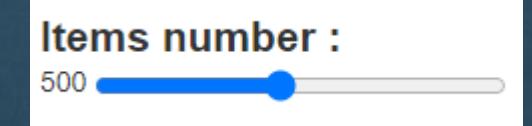
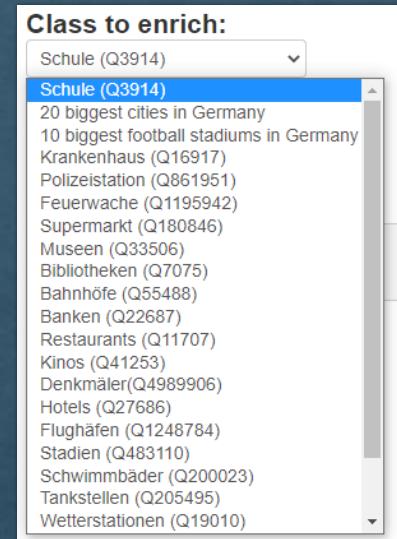
- Linkage between the enrichment and the thematic maps
- Choose an example of SPARQL request
- Have the possibility to modify it and get a potential error message
- Run the query, display results on a table and on a map



Linked Data enrichment (1)

```
<!-- List of example requests -->
<span style="font-weight: bold; font-size: 1.5em;">Class to enrich:</span><br>
<select name="classToEnrich" id="requestChoice" value="schools" onclick="updateRequest()">
  <option value="schools">Schule (Q3914)</option>
  <option value="twentyBiggestCities">20 biggest cities in Germany</option>
  <option value="tenBiggestStadiums">10 biggest football stadiums in Germany</option>
  <option value="hospitals">Krankenhaus (Q16917)</option>
  <option value="policeStations">Polizeistation (Q861951)</option>
  <option value="fireStations">Feuerwache (Q1195942)</option>
  <option value="supermarkets">Supermarkt (Q180846)</option>
  <option value="museums">Museen (Q33506)</option>
```

```
<!-- Cursor - It is possible to change the value range and the step of change on the input line -->
<span style="font-weight: bold; font-size: 1.5em;">Items number :</span><br>
<span id="nbOfPoints"> </span>
<input type="range" id="pointsCursor" min="100" max="1000" value="500" step="50" class="inputRange" oninput="showVal(this.value)" onclick="updateRequest()">
<br><br>
```



Linked Data enrichment (2)

```
// Displaying the new value of the cursor
function showVal(newNbOfPoints){
    document.getElementById("nbOfPoints").innerHTML=newNbOfPoints;
}

// Updating the request if the cursor moves or if another example is selected
function updateRequest() {
    document.getElementById('requestChoice').addEventListener('click',() => checkRequest());
    document.getElementById('pointsCursor').addEventListener('click', () => checkRequest());
}

// On page loading, displays the value of the cursor and shows a request
function onLoad() {
    document.getElementById("nbOfPoints").innerHTML= document.getElementById("pointsCursor").value;
    document.getElementById("sparqlText").value = queries[document.getElementById('requestChoice').value].concat(document.getElementById('pointsCursor').value);
}

// Checks if the request should be updated or not
function checkRequest(){
    if(document.getElementById('requestChoice').value!="twentyBiggestCities"
        && document.getElementById('requestChoice').value!="tenBiggestStadiums"){
        document.getElementById("sparqlText").value =
        queries[document.getElementById('requestChoice').value].concat(document.getElementById('pointsCursor').value);
    }
    else {
        document.getElementById("sparqlText").value = queries[document.getElementById('requestChoice').value];
    }
}
```

Linked Data enrichment (3)

```
<!-- Text box showing the error, if the request does not work -->
>Potential error</span>
<pre style="margin-right: 30px; max-height: 400px;">
    <code th:text="${errorMessage}"></code>
</pre>

} catch (Exception e) {
    r = e.getMessage();
}

//add attributes to model
model.addAttribute("cl", columnNames);
model.addAttribute("MDlist", resultList);
model.addAttribute("errorMessage", r);

return "sparql";
```



Linked Data enrichment (4)

```
<!-- Text box where the request is shown -->
<div style="float: right;" onload="onLoad()">
  <form action="#" th:action="@{/enrichment/results}" th:object="${squery}" method="post">
    <!-- Text box -->
    <textarea id="sparqlText" rows="16" cols="60" style="font-size: 1.6em; width: 100%; height: 100%; line-height: 150%" th:field="*{results}">YOUR QUERY</textarea><br>
    <!-- Submit button -->
    <input style="margin-left: auto; margin-right: auto; font-size: 1.4em;" type="submit" name="Submit" value="Get the query results">
  </form>
  <br><br><br>
</div>
```

```
SELECT ?item ?itemLabel ?latitude ?longitude WHERE {
  ?item wdt:P31 wd:Q3914.
  ?item wdt:P17 wd:Q102.
```

```
?latitude .
?longitude .
```

```
YOUR QUERY
```

```
}
```

```
}
```

```
LIMIT 500
```

Get the query results

Linked Data enrichment (5)

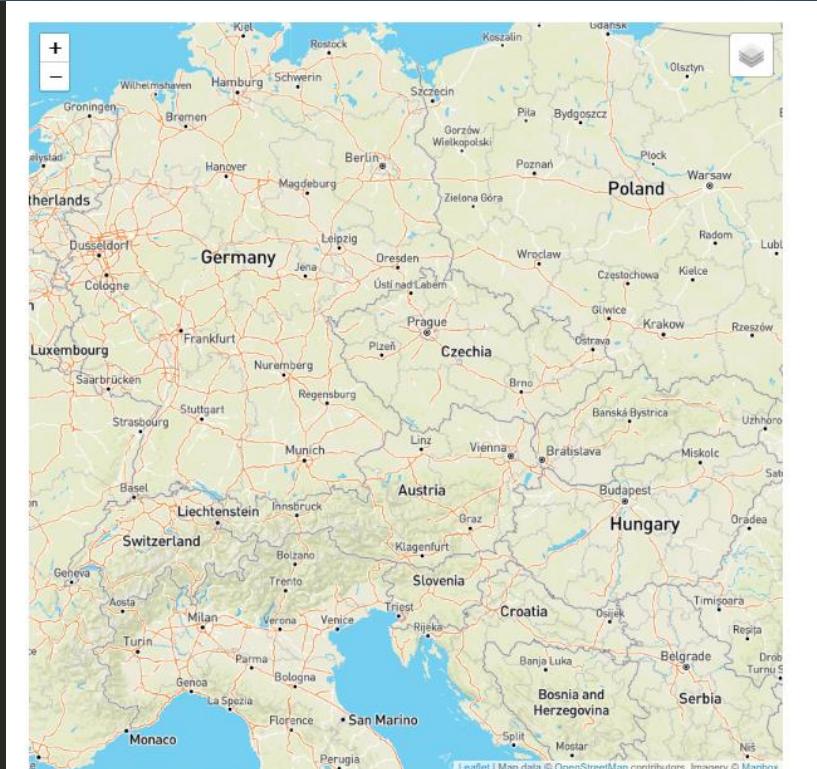
```
<section>
  <!-- Map -->
  <div id=map style="position : relative; width: 800px; height: 800px; margin: 0 auto;">
    <!-- Leaflet script and stylesheet -->
    <script src="https://unpkg.com/leaflet@1.7.1/dist/leaflet.js" integrity="sha512-XQoYMqMTK8LvdXYG3nZ448h0Eqiglfqk3s1NOQV44cWnUrBc8PkAOcXy20w0v1aXaUearIO8hiXZ5V3ynxwA==" crossorigin=""></script>
    <link rel="stylesheet" href="https://unpkg.com/leaflet@1.7.1/dist/leaflet.css" integrity="sha512-xodZBNTC5n17Xt2atTPuE1hxjVMSvLVW9ocqUKLsCC5CXdbqCmblAshOMAS6/keqq/sMZM19scR4PsZCfSR7A==" crossorigin="">
  <!-- Retrieving data from the request -->
  <script th:inline="javascript">
    var dataArray = /*[$MDList]]*/ 'default';
    // Function used to retrieve size of the data array
    // Data is stored as followed :
    // data = [ itemIndex, itemLabel, latitude, longitude]
    Object.size = function(obj) {
      var size = 0;
      key;
      for (key in obj) {
        if (obj.hasOwnProperty(key)) size++;
      }
      return size;
    };
    var sizeOfArray = Object.size(dataArray);
  </script>
  <script>
    // Creation of one layer of points
    var query = new L.LayerGroup()
    // Loop to add every point of the results to the map
    for(let i = 0; i<sizeOfArray; i++){
      // To add a point :
      // L.marker([latitude, longitude]).bindPopup(nameOfThePoint).addTo(nameOfTheLayer);
      L.marker([dataArray[i][2],dataArray[i][3]]).bindPopup(dataArray[i][1]).addTo(query);
    }
  </script>
  <!-- Leaflet script and stylesheet -->
  <script src="https://unpkg.com/leaflet@1.7.1/dist/leaflet.js" integrity="sha512-XQoYMqMTK8LvdXYG3nZ448h0Eqiglfqk3s1NOQV44cWnUrBc8PkAOcXy20w0v1aXaUearIO8hiXZ5V3ynxwA==" crossorigin=""></script>
  <link rel="stylesheet" href="https://unpkg.com/leaflet@1.7.1/dist/leaflet.css" integrity="sha512-xodZBNTC5n17Xt2atTPuE1hxjVMSvLVW9ocqUKLsCC5CXdbqCmblAshOMAS6/keqq/sMZM19scR4PsZCfSR7A==" crossorigin="">
  <!-- Map data &copy; <a href="https://www.openstreetmap.org/copyright">OpenStreetMap</a> contributors, + Imagery <a href="https://www.mapbox.com/">Mapbox</a>, mbUrl = 'https://api.mapbox.com/styles/v1/{id}/tiles/{z}/{x}/{y}?access_token=pk.eyJ1IjoibWFwYm94IiwiYSI6ImNpejY4NXVycTA2emYycXBndHRqcmZ3N3gifQ.rJcFIG214ArIISLbB6B5aw';
  // Creation of two layers : grayscale, and streets map
  // It is also possible to add a satelite map, landform map, ..
  var grayscale = L.tileLayer(mbUrl, {id: 'mapbox/light-v9', tileSize: 512, zoomOffset: -1, attribution: mbAttr}),
  streets = L.tileLayer(mbUrl, {id: 'mapbox/streets-v11', tileSize: 512, zoomOffset: -1, attribution: mbAttr});
  // Definition of the map, and setup of details : coordinates of the center, zoom level and layers that appear on loading
  var map = L.map('map', {
    center: [49.99, 8.24],
    zoom: 6,
    layers: [streets, query]
  });
  // Definition of layers
  var baseLayers = {
    "Grayscale": grayscale,
    "Streets": streets
  };
  // Definition of point layers
  var overlays = {
    "Query" : query
  };
  // Add layers and points layers to the map
  L.control.layers(baseLayers, overlays).addTo(map);
</script>
```

Linked Data enrichment (6)

```
<!-- Displaying the table of results -->
<div class="tableContentSPARQL">

    <span id="nbOfResults" style="width: 150px; height: 10px"> 0 result(s).</span>

    <script type="text/javascript">
        document.getElementById("nbOfResults").innerHTML = sizeOfArray.toString().concat(" result(s).");
    </script>
    <table border="1" style="width: 700px; margin: 0 auto;">
        <thead>
            <!-- Definition of the 4 columns -->
            <tr><th colspan="4" style="text-align: center; font-size: 1.2em;">Results of the query</th></tr>
            <tr style="text-align: center;">
                <th><span>item</span></th>
                <th><span>itemLabel</span></th>
                <th><span>Latitude</span></th>
                <th><span>Longitude</span></th>
            </tr>
        </thead>
        <tbody>
            <!-- Filling the 4 columns with the results from WikiData-->
            <tr th:each="md: ${MDlist}">
                <td style="width: 170px;"><span th:text="${md[0]}"></span></td>
                <td style="width: 170px;"><span th:text="${md[1]}"></span></td>
                <td style="width: 170px;"><span th:text="${md[2]}"></span></td>
                <td style="width: 170px;"><span th:text="${md[3]}"></span></td>
            </tr>
        </tbody>
    </table>
</div>
```



Results of the query			
item	itemLabel	Latitude	Longitude

Personal assessment

- Improve of our English skills
- Improve of our developpment skills
- Learning how to work in team with almost total autonomy
- Learning of a lot of new concept (semantic web, MVC, SPARQL, ...)
- Improve our autonomy by teleworking

Thank you very much for the trust you
have placed in us, it was a real pleasure
to work for you!