



CZECH
TECHNICAL
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IN
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**FACULTY OF
ELECTRICAL ENGINEERING**

OSW - Road accidents within the weather context in Prague - CP 0

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Table of Contents

Motivation	1
Data source selection	1
Data sources description	2
DS1	2
Preview.	2
Data description	3
DS2 and DS3*	3
Previews	3
Data description	4
DS4*	4
Preview.	4
Data description	5
DS5*	5
Preview.	5
Data description	6
Conclusion.	7

Motivation



A lots of traffic accidents are caused by weather (poor visibility, strong wind or rainfall, humidity on the road etd.). An integration of a road info (accidents) and meteorological sensors/stations could help to see connections between accidents and weather. This information could be used in an road safety application that will be able to notificate drivers against imminent danger due to weather.

Data source selection

I have selected folowing data sources from different providers (see table below) for the data integration of a road and meteorological data . I have found also other datasets that could be taken into account. These data sources are marked by star label.

Table 1. Data source overview

Data source/set #	Provider	Web sides	Format	Description
DS 1	Ředitelství silnic a dálnic ČR	http://www.dopravniiinfo.cz/	xml	Integrated Traffic Information System for the Czech Republic
DS 2	Český hydrometeorologický ústav	http://portal.chmi.cz	xls	Prague Ruzyně station. A dataset of daily hydrometeorological data from 1961 to 2016. Updates are done once a year.
DS 3*	Český hydrometeorologický ústav	http://portal.chmi.cz	xls	Prague Libuš station. A dataset of daily hydrometeorological data from 1961 to 2016. Updates are done once a year.

Data source/set #	Provider	Web sides	Format	Description
DS 4*	Český hydrometeorologický ústav	http://portal.chmi.cz	xlsx	Regular meteorological measurements at the Prague Clementin Observatory. Average daily temperature, air temperature extremes (since 1775), daily rainfall (since 1804). Update once a year.
DS 5*	Technická správa komunikací hlavního města	API rss/json	http://www.tsk-praha.cz	Meteo Stations - List of all weather sensors in Prague. DS contents interesting meteorological measurements like the road temperature and wet.

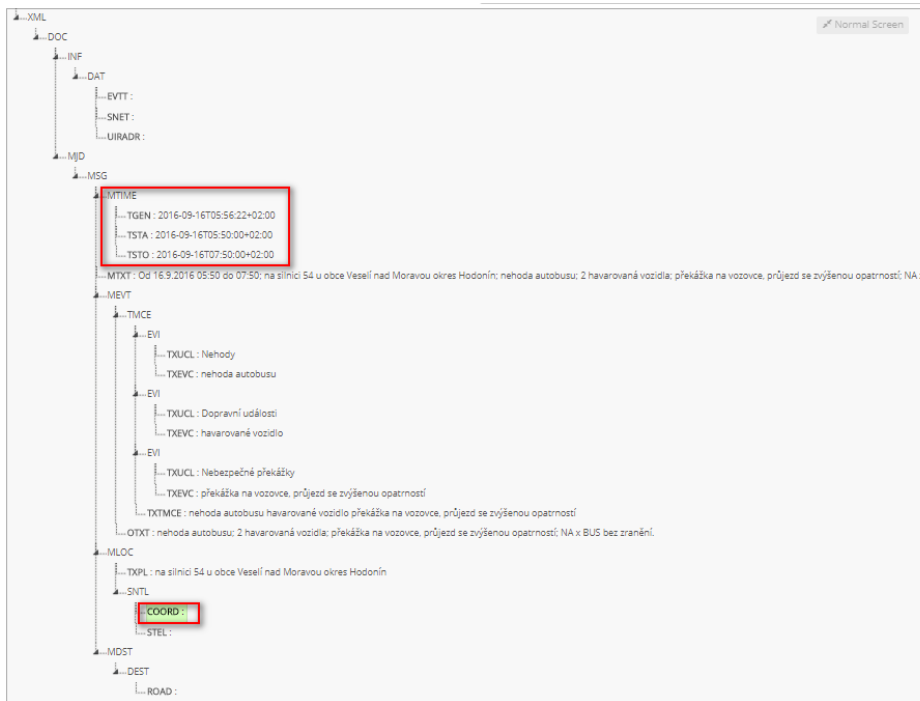
Data sources description

The following sections describe the datasets described above.

DS1

The machine readable XML dataset (appx. 300MB) about the road traffic from the B4M33OSW website [1: https://cw.fel.cvut.cz/wiki/courses/osw/semestral_work] with events about road accidents in the Czech Republic in several months.

Preview



Name	Value
x	48.9379397769639
y	17.4308000290231

Figure 1. DS1 preview

Data description

The data are freely accessible (<https://portal.gov.cz/portal/ostatni/volny-pristup-k-ds.html>). Only a subset of data (a month) will be selected due to the data size. The data schema contents the detailed description of the accident including the dates and values of the geographical location.

DS2 and DS3*

Datasets DS2 and DS3* have the same data schema and also other data aspects.

Previews

	A	B	C	D	E	F	G
1	Základní geografie stanice Praha - Ruzyně (P1PRUZ01)						
2							
3	indikativ stanice	WMO indikativ	název stanice	začátek pozorován	konec pozorování	zeměpisná šířka	zeměpisná délka
4	P1PRUZ01	11518	Praha, Ruzyně	01.01.1946	31.08.1976	50°05'39"	014°16'54"
5	P1PRUZ01	11518	Praha, Ruzyně	01.09.1976	31.12.1999	50°06'03"	014°15'28"
6	P1PRUZ01	11518	Praha, Ruzyně	01.01.2000	dosud	50°06'01"	014°15'20"
7							
8							
9							
10	MS	meteorologická stanice s profesionální obsluhou					
11	AMS	meteorologická stanice s profesionální obsluhou a automatizovaným měřicím systémem					
	geografie stanice	teplota průměrná	teplota maximální	teplota minimální	ry ...		

Figure 2. DS2 and DS3* preview one

	A	B	C	D	E	F	G	H
1	Denní úhrn srážek v mm							
2	stanice: P1PRUZ01							
3								
4	rok	měsíc	1.	2.	3.	4.	5.	6.
5	1961	01	0,0	0,0	0,0	0,0	0,0	0,0
6	1961	02	3,6	0,6	0,0	1,1	0,0	0,6
7	1961	03	0,0	4,4	0,1	0,0	0,0	0,0
8	1961	04	1,0	1,0	1,4	0,8	0,0	0,0
9	1961	05	1,6	0,4	0,8	0,4	1,9	0,1
10	1961	06	0,7	12,1	14,4	8,2	0,1	1,6
11	1961	07	0,0	0,0	0,0	0,1	1,9	0,0
vlhkost vzduchu			úhrn srážek		celková výška sněhu		Sheet1	

Figure 3. DS2 and DS3* preview two

Data description

Simple data table format (xls). The datasets content xls sheets. The first one describes meteorological station (e.g. latitude and longitude) and the next sheets contains daily hydrometeorological data about rainfall, the total amount of snow, humidity, air pressure, wind speed, sunshine and max/min/average temperature from 1961 to 2016, thus the datasets contain a large amount of data.

DS4*

Regular meteorological measurements at the Prague Clementin Observatory. Average daily temperature, air temperature extremes (since 1775), daily rainfall (since 1804). Update once a year.

Preview

	A	B	C	D	E	F	G	H
1	rok	měsíc	den	T-AVG	TMA	TMI	SRA	Flag
88341	2016	11	12	1,5	2,5	0,8	0,0	T
88342	2016	11	13	0,3	3,6	-1,6	0,0	
88343	2016	11	14	-0,3	3,6	-3,5	0,0	
88344	2016	11	15	1,7	3,4	-2,7	2,0	
88345	2016	11	16	7,9	9,3	3,4	3,5	
88346	2016	11	17	10,3	12,2	8,9	0,0	
88347	2016	11	18	10,5	12,1	8,5	1,8	
88348	2016	11	19	7,5	10,5	7,4	3,9	
88349	2016	11	20	5,7	9,3	4,6	0,0	
88350	2016	11	21	6,1	7,6	2,4	0,0	
88351	2016	11	22	7,5	10,5	4,0	0,0	
88352	2016	11	23	8,6	9,8	7,4	0,0	T
88353	2016	11	24	8,5	9,6	7,6	0,0	
88354	2016	11	25	6,8	9,2	6,2	0,0	
88355	2016	11	26	5,8	7,1	4,1	0,0	
88356	2016	11	27	4,9	7,4	3,9	0,0	T
88357	2016	11	28	1,2	4,0	0,5	0,0	T

Figure 4. DS4* preview

Data description

Simple data table format (xlsx). Geographical locations of the Prague Clementin Observatory are not available in the dataset, thus its need to be manually added. This dataset contains less meteorological values than DS2 and DS3*.

DS5*

Meteo Stations - List of all weather sensors in Prague. Available via API as JSON or RSS format. Get only actual data. A data collection is required.

- <http://www.tsk-praha.cz/tskexport3/json/meteosensors>
- <http://www.tsk-praha.cz/tskexport/rss/meteocidla>

Preview

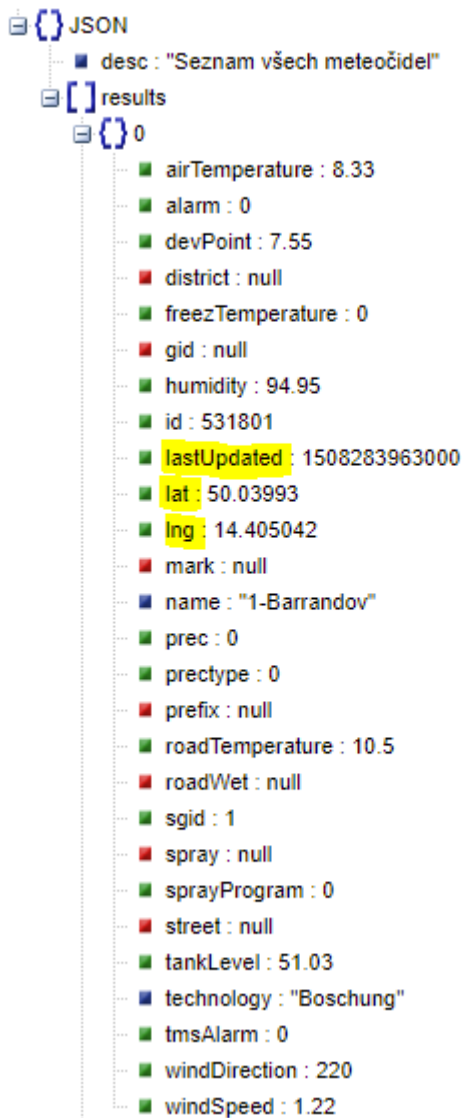


Figure 5. DS5* preview JSON

```
<?xml version='1.0' encoding='UTF-8'>
<rss xmlns:content="http://purl.org/rss/1.0/modules/content/" xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:taxo="http://purl.org/rss/1.0/modules/taxonomy/"
xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:ibmfs="http://purl.org/net/ibmfeedsvc/feedsvc/1.0" version="2.0">
  <channel>
    <title>Meteočidla - TSK Praha</title>
    <link>http://www.tsk-praha.cz/tskexport/rss/meteocidla</link>
    <description>Seznam meteočidel TSK Praha</description>
    <pubDate>Wed, 18 Oct 2017 17:42:13 GMT</pubDate>
    <dc:date>2017-10-18T17:42:13Z</dc:date>
  </channel>
  <item>
    <title>1-Barrandov</title>
    <link>
      http://www.tsk-praha.cz/tskexport/rss/meteocidla/?singleRecord=true&actualdata=true&id=531801
    </link>
    <description>
      <div id='531801'><div class='datum'>Čas: 2017-10-18 19:39:46.0</div><div class='teplota_vzduchu'>Teplota vzduchu: 13.13</div><div class='teplota_vozovky'>Teplota vozovky:
      14.87</div><div class='vlhkost'>Vlhkost: 91.75</div><div class='rychlost_vetru'>Rychlost větru: 0.34</div><div class='smer_vetru'>Směr větru: 75</div><div class='rosny_bod'>Rosný
      bod: 11.8</div></div>
    </description>
    <pubDate>Wed, 18 Oct 2017 17:39:46 GMT</pubDate>
    <guid>
      http://www.tsk-praha.cz/tskexport/rss/meteocidla/?singleRecord=true&actualdata=true&id=531801
    </guid>
    <dc:date>2017-10-18T17:39:46Z</dc:date>
  </item>
</rss>
```

Figure 6. DS5* preview RSS

Data description

This data source contains very interesting meteorological measurements like the road temperature and wet. The disadvantage is that a long time data collection is needed to get a dataset.

Conclusion

The DS1 and DS2 can be integrated by date values. In my point of view the idea of this assignment could have a considerable potential in in a practical use. I would like to discuss personally with the lecturers the possibilities of this assignment idea due to a lack of practical knowledge in the Ontologies and Semantic Web field. The main discussion topic is whether the geographical integration of datasets is possible.