

MDK: Modern Database Concepts

<http://www.ksi.mff.cuni.cz/~svoboda/courses/192-MDK/>

Practical Class 4

SPARQL

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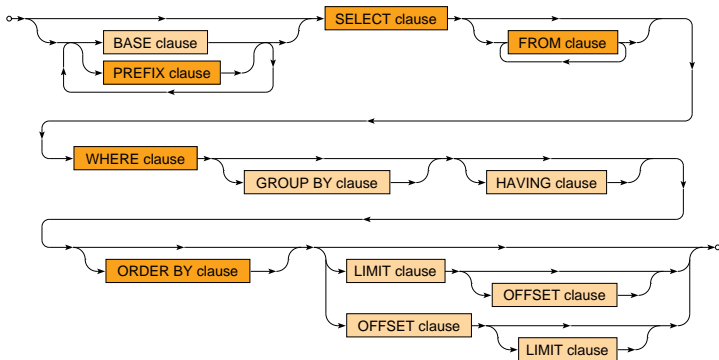
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Charles University, Faculty of Mathematics and Physics

OTH Regensburg, Faculty of Computer Science and Mathematics

Select Queries

Clauses of **SELECT** queries



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Clauses of **SELECT** queries

- **BASE** – base address for all relative identifiers
- **PREFIX** – base addresses for prefixed names
- **SELECT** – **variables to be projected**
- **FROM** – **data graphs to be queried**
- **WHERE** – **graph patterns to be matched**
- **GROUP BY** – variables to be used for grouping
- **HAVING** – conditions these groups must satisfy
- **ORDER BY** – criteria used to sort solutions
- **LIMIT** – number of solutions to be included
- **OFFSET** – number of solutions to be skipped

NoSQL Server

Use your web browser to access our **SPARQL endpoint**

- <https://nosql.opendata.cz/sparql>

Explore the contents of our **RDF data graph**

- Identifier: `http://nosql.opendata.cz/school/`
 - Preserve every tiny detail, i.e., lowercase, `http` and not `https`, slash symbol at the end

Exercise 1

Express the following SPARQL query

- **Select all students**
- Return personal numbers, first and last names

| ?n | ?f | ?l |
|----|-------|--------|
| 2 | Petr | Skoda |
| 4 | Tomas | Knap |
| 6 | Jakub | Klimek |
| 8 | Jakub | Starka |

Exercise 2

Express the following SPARQL query

- **Select all courses** with codes starting with *NPRG*
 - Use *regex(string, pattern)* function
- Return course codes and titles
- Order the courses using their titles

| ?c | ?t |
|---------|------------------|
| NPRG030 | Programming I |
| NPRG036 | XML Technologies |

Exercise 3

Express the following SPARQL query

- **Find students and their e-mail addresses**
 - Note that e-mail addresses might be missing
- Return personal numbers and e-mails

| ?n | ?e |
|----|--------------|
| 2 | skoda@uni.cz |
| 4 | knap@uni.cz |
| 6 | |
| 8 | |

Exercise 4

Express the following SPARQL query

- **Select students, their e-mails, and web pages**
 - Note that both e-mails and web pages might be missing
- Return personal numbers, e-mails, and web pages

| ?n | ?e | ?w |
|----|--------------|----------------------------|
| 2 | skoda@uni.cz | http://www.uni.cz/~skoda/ |
| 4 | knap@uni.cz | |
| 6 | | http://www.uni.cz/~klimek/ |
| 8 | | |

Exercise 5

Express the following SPARQL query

- **Select courses that are taught on Mondays or Fridays** during summer semester *2019/20*
- Return course references and codes

| ?p | ?c |
|---|---------|
| <http://nosql.opendata.cz/school/course7> | NPRG036 |
| <http://nosql.opendata.cz/school/course5> | NSWI096 |

Exercise 6

Express the following SPARQL query

- **Select courses that are not taught on Mondays or Fridays** during summer semester *2019/20*
 - Including courses that are not taught at all in this semester
- Return course references and codes

| ?p | ?c |
|---|---------|
| <http://nosql.opendata.cz/school/course3> | NPRG030 |
| <http://nosql.opendata.cz/school/course1> | NSWI090 |

Exercise 7

Express the following SPARQL query

- **Select courses that are not taught on Mondays or Fridays** during summer semester *2019/20*
 - Including courses that are not taught at all in this semester
- Return course references and codes
- **Do not use NOT EXISTS and nor MINUS constructs**

| ?p | ?c |
|---|---------|
| <http://nosql.opendata.cz/school/course3> | NPRG030 |
| <http://nosql.opendata.cz/school/course1> | NSWI090 |

Exercise 8

Express the following SPARQL query

- **Return average study results for all students**
 - Assume only courses in summer semester *2019/20*
- Ignore enrollments with undefined results
- Describe students by their full names
- Include students with at most 10 courses only