

**B4M36DS2: Database Systems 2**

<http://www.ksi.mff.cuni.cz/~svoboda/courses/2016-1-B4M36DS2/>

Practical Class 6

# **XQuery and XPath Languages**

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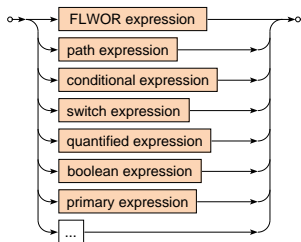
21. and 22. 11. 2016

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# XQuery Expressions

## Expressions



- **FLWOR** expressions
  - `for ... let ... where ... order by ... return ...`
- **Conditional** expressions
  - `if ... then ... else ...`

# XQuery Expressions

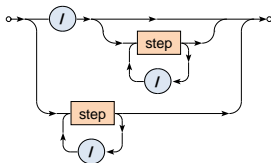
## Expressions

- **Quantified** expressions
  - `some|every ... satisfies ...`
- **Boolean** expressions
  - `and, or, not` logical connectives
- **Path** expressions
  - Selection of nodes of an XML tree
- **Primary** expressions
  - Literals, variable references, function calls, **constructors**, ...
- ...

# Path Expressions

## Path expression

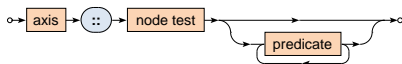
- Absolute / relative paths



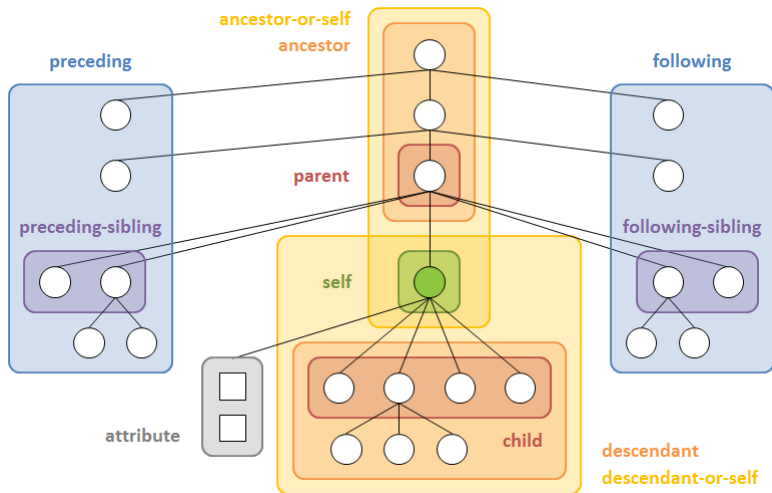
# Path Expressions

## Steps of path expressions

- **Axis**
  - Specifies the relation of nodes to be selected for a given node
- **Node test**
  - Filters nodes selected by the given axis using basic tests
- **Predicates**
  - Filter the nodes again, this time using advanced conditions



# Path Expressions: Axes



# Exercise 1

Express the following XPath queries

- Return titles of all movies
- Return names of all actors (just text content)
- Return identifiers of all movies (their values)
- Return all genres (without duplicities)

## Exercise 2

Express the following XPath query

- **Return titles of movies that were filmed in *2005* or later and that have a director specified**



# Exercise 3

Express the following XPath query

- **Return titles of movies having their length above the overall average**

# Exercise 4

Express the following XPath query

- **Return title of the very last movie in the document**

# Exercise 5

Express the following XPath query

- **Return years of birth of actors that played at least in one movie**

# Exercise 6

Express the following XQuery query

- **Return a sequence of all the movies filmed in 2005 and later**
- **Respect the following output structure**

```
<movie title="movie-title">
  <actor>actor-name</actor>
  ...
</movie>
...
```

# Exercise 7

Express the following XQuery query

- **Return a sequence of titles of movies that have a rating above the overall average**
- Order the movies according to their ratings (ascending order) and then also years (descending order)

# Exercise 8

Express the following XQuery query

- **Find movies in which all the following actors played**
  - *Jiří Macháček*
  - *Jitka Schneiderová*
- Return titles of these movies
- Use quantified expression

# Exercise 9

Express the following XQuery query

- **Generate an XHTML table with data about movies**

```
<table>
  <tr>
    <th>Title</th><th>Director</th><th>Actors</th><th>Genres</th>
  </tr>
  <tr>
    <td>movie-title</td>
    <td>director-name-or-unknown</td>
    <td>number-of-actors</td>
    <td>comma-separated-list-of-genres</td>
  </tr>
  ...
</table>
```

- Use `<i>Unknown</i>` when a director is missing