

# INFO-H-509 : Technologies XML

## TP 1 - An introduction to XML and XPath

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### XML Schema Validity

All the needed documents are available on the web page.

#### Exercise 1.1

The `schedule.xml` document describes a course schedule. Is the document valid with respect to `schedule.xsd`? If not, make the necessary corrections so that it becomes valid.

#### Exercise 1.2

The schema is not very demanding as regards to the content of element `course`. The required constraints are the following :

Each event (lecture or exercises) is characterized by an attribute `on` (indicating the date), a room, and optionally a unique name defined by the `id` attribute.

An event describes either a lecture or an exercise. Both are described by elements `topic`. Each lecture's topic is describe by an uri. Each exercises comprises from one to three lecture as a topic.

Proceed as follow to complete the schema :

- Complete the definition of `eventType`, as a basis to describe courses and exercises. It will contain the common definitions.
- Extend this type for courses an exercises.
- Extend the definition of `course`, so that courses and exercises sessions can be interlaced.

#### Exercise 1.3

**Additional exercise** : By the use of `unique`, `key` and `keyref` elements, ensure that lecture's resources are unique, a lecture refers to an existing room, and that an exercise refer to an existing lecture. Correct the document if necessary.

#### Exercise 1.4

Complete the following schema to use namespaces as the instance :

```
<message on="2010-03-23T17:55:00" xmlns="http://www.example.org/message">  
  Hello!  
</message>
```

```

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType name="message">
    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute name="on" type="xs:dateTime" />
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>

  <xs:element name="message" type="message" />
</xs:schema>

```

## Expressions régulières et DTD

### Exercice 2.1

Let us consider the following regular expressions over the alphabet  $a, b, c, d$  :

1.  $a(bb?)?(c^+(a|d))$
2.  $a^+bbccd$
3.  $c?b?(a^*|b|c)^+$
4.  $c^*(abcabc)$
5.  $(a^+b)^+(cd)^+$

Determine which regular expressions accept the following strings :

- A.  $abcabc$    B.  $abcd$    C.  $abbccd$    D.  $cabcabc$    E.  $aaccd$    F.  $abaaabcd$

**Additional exercise** Are all these regular expressions deterministic ?

### Exercice 2.2

Complete the DTD corresponding to the first exercise : apply similar constraints to the `courses` element if possible.

### Exercice 2.3

Compare the two schemas, DTD and XML Schema. What are the main differences ?