RDF

in a nutshell

fabien, gandon, inria

the web to
humans


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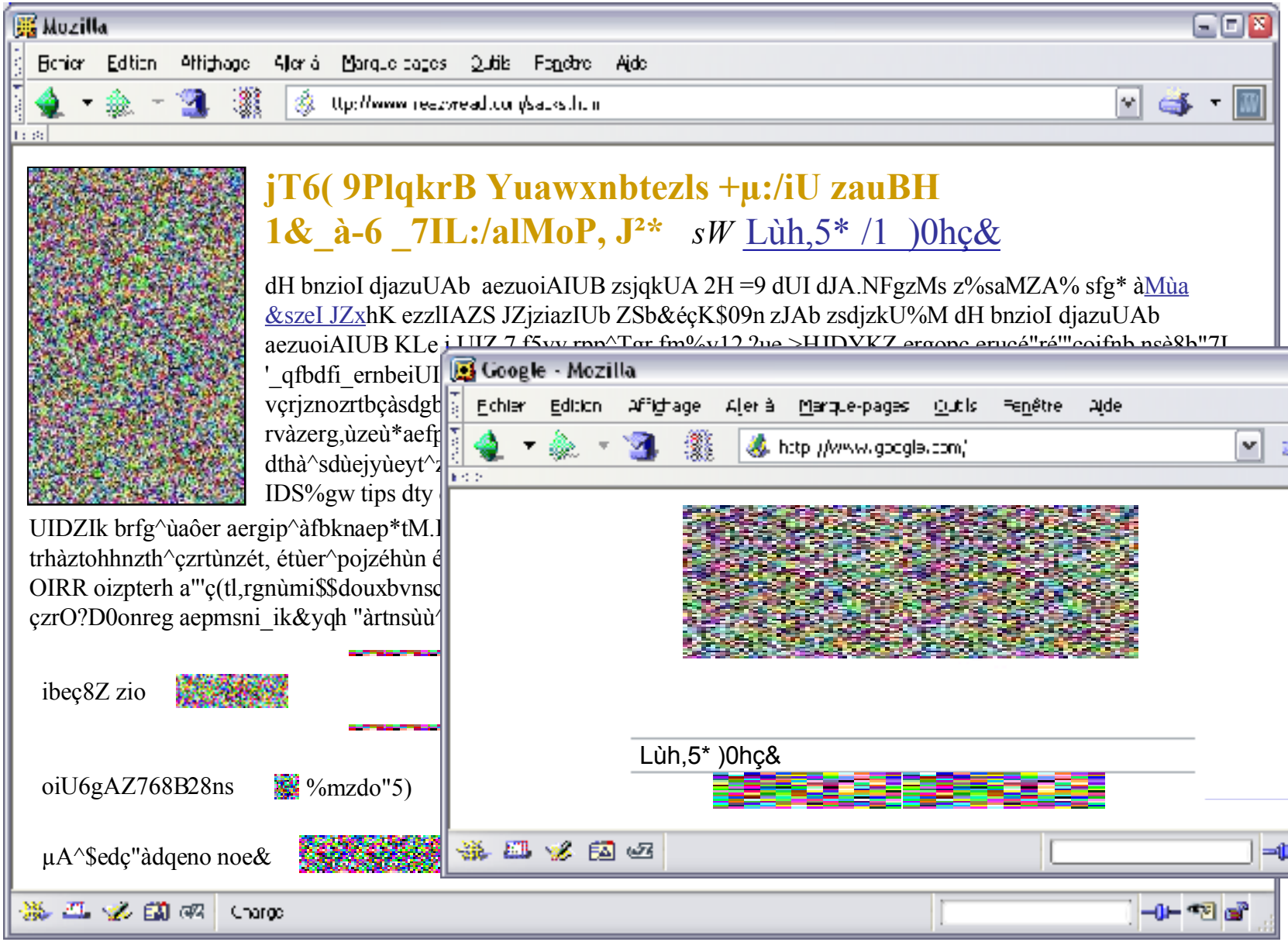
the same web to
machines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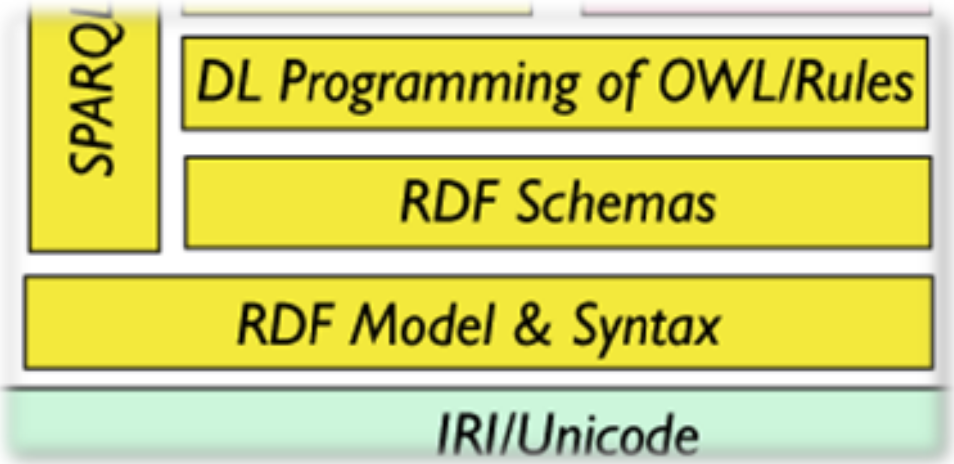
the semantic web is an extension to add to the web some metadata for **machines**

RDF is the first layer of the semantic web standards



RDF stands for
Resource Description Framework

RDF stands for

Resource: *pages, images, videos, ... everything that can have a URI*

Description: *attributes, features, and relations of the resources*

Framework: *model, languages and syntaxes for these descriptions*

in RDF knowledge always

comes in three

RDF is a triple model *i.e.* every piece of knowledge is broken down into

(subject , predicate , object)

take for instance the following piece of

knowledge

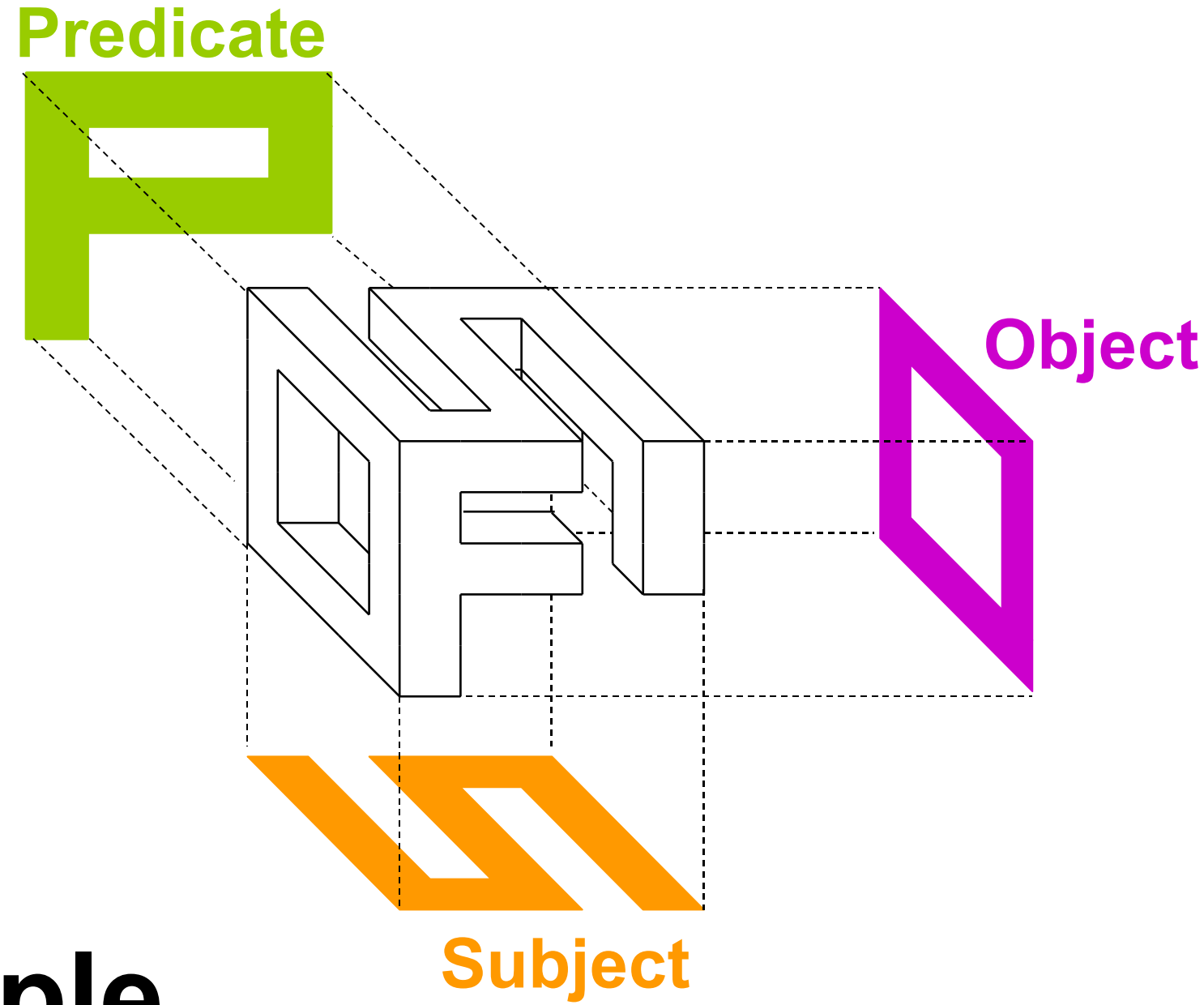
doc.html has for author Fabien and has for theme Music

doc.html has for author Fabien
doc.html has for theme Music

(doc.html , author , Fabien)
(doc.html , theme , Music)

(subject , predicate , object)

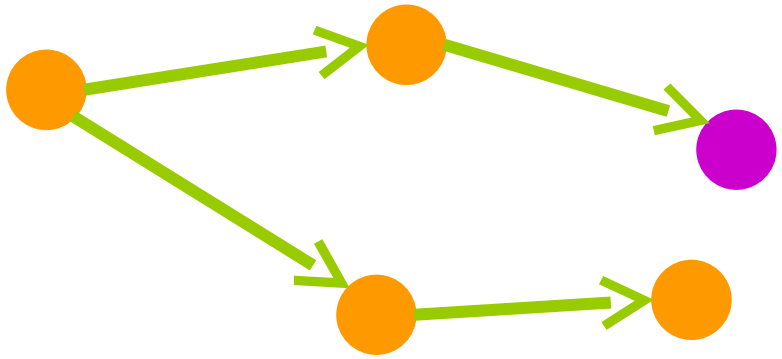
in **RDF** the atoms of knowledge are triples of the form (subject,predicate,object)



a triple

the RDF atom

RDF is also a graph model
to link the descriptions of resources

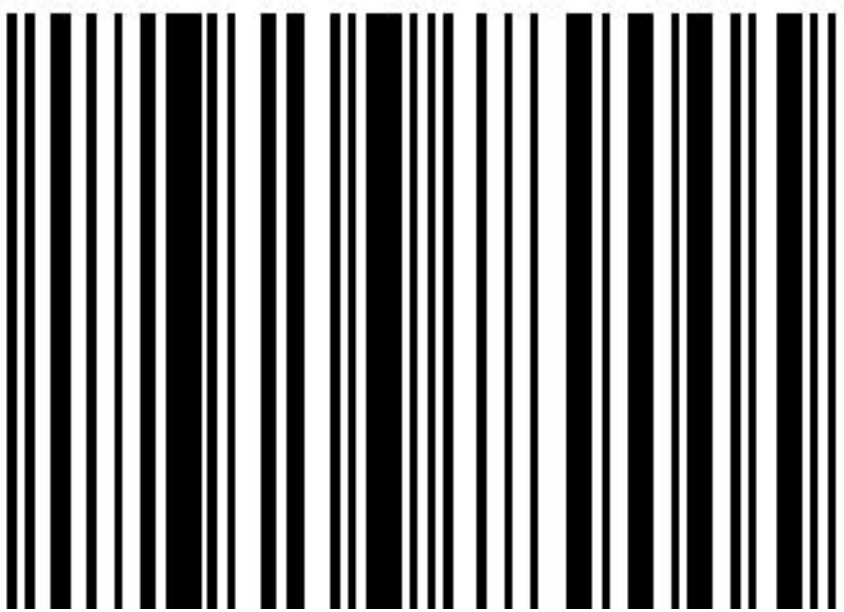


RDF triples can be seen as arcs of a graph (vertex,edge,vertex)

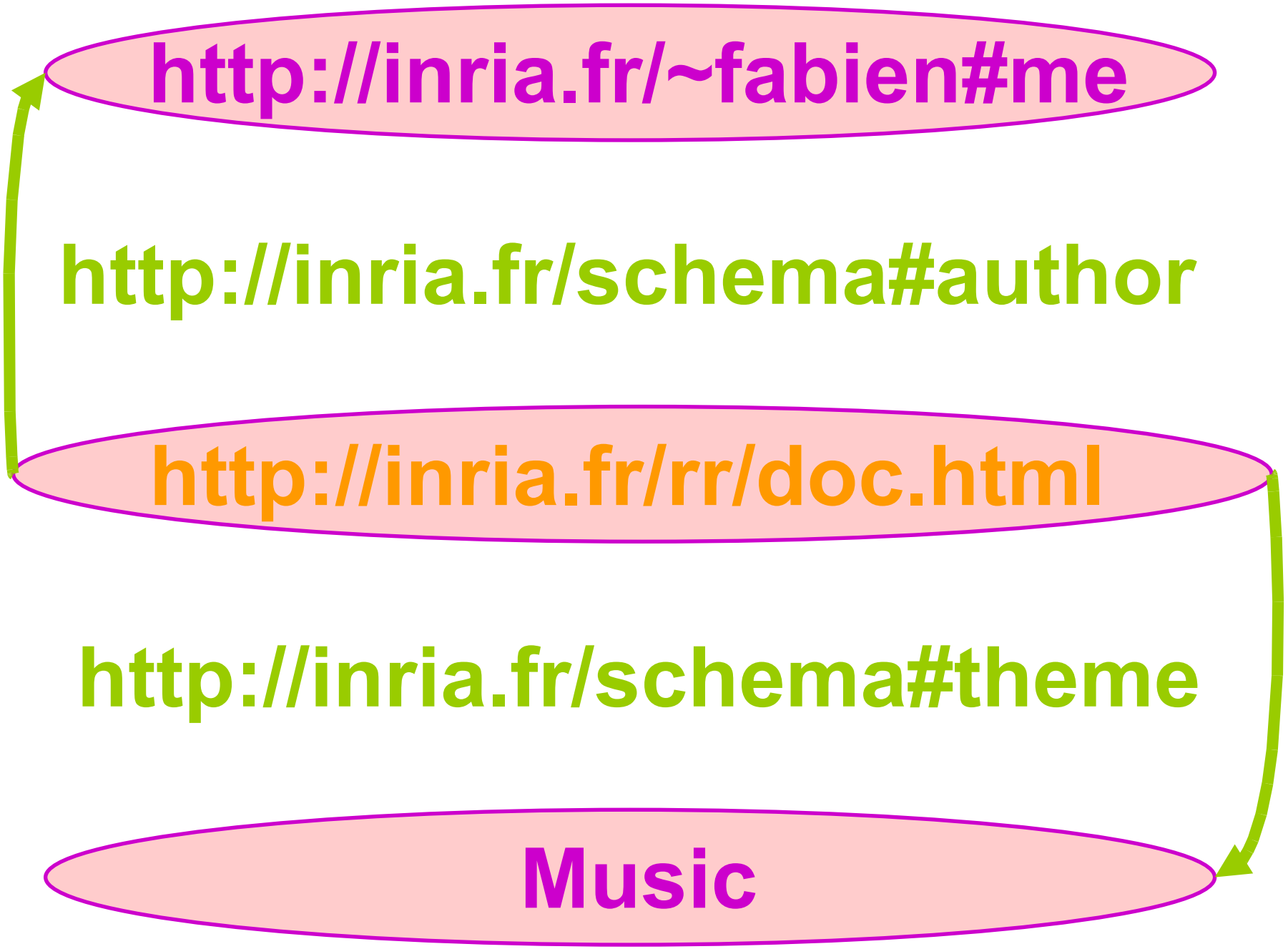
(doc.html , author , Fabien)
(doc.html , theme , Music)


Fabien
author
doc.html
theme
Music

in RDF resources and properties are identified by URIs



http://mydomain.org/mypath/myresource


http://inria.fr/~fabien#me
http://inria.fr/schema#author
http://inria.fr/rr/doc.html
http://inria.fr/schema#theme
Music

in RDF values of properties can also be literals i.e. strings of characters

(doc.html , author , Fabien)
(doc.html , theme , "Music")


http://inria.fr/~fabien#me
http://inria.fr/schema#author
http://inria.fr/rr/doc.html
http://inria.fr/schema#theme
"Music"

in RDF literal values of properties can also be typed with XML datatypes

doc.html has for author Fabien
and has 192 pages


http://inria.fr/~fabien#me
http://inria.fr/schema#author
http://inria.fr/rr/doc.html
http://inria.fr/schema#nbPages
"192"^^xsd:integer

RDF allows blank
nodes

a resource may be

anonymous

i.e. not identified by a URI

and noted _:*xyz*

e.g.,

there exists **a report about Music**


http://inria.fr/schema#Report
rdf:type
_:x
http://inria.fr/schema#theme
"Music"

```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-
  rdf-syntax-ns#"
  xmlns:inria="http://inria.fr/schema#" >
```

NOTHING HERE

```
  <inria:Report>
    <inria:theme>Music</inria:theme>
  </inria:Report>


</rdf:RDF>
```

blank nodes

break

the graph, they cannot be reused

name

your resources and reuse existing names as much as possible

<RDF/> has an XML syntax

don't run
away

```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-
  rdf-syntax-ns#"
  xmlns:inria="http://inria.fr/schema#" >

  <rdf:Description
  rdf:about="http://inria.fr/rr/doc.html">
    <inria:author rdf:resource=
            "http://inria.fr/~fabien#me" />
    <inria:theme>Music</inria:theme>
  </rdf:Description>

</rdf:RDF>
```

it's only for

machines

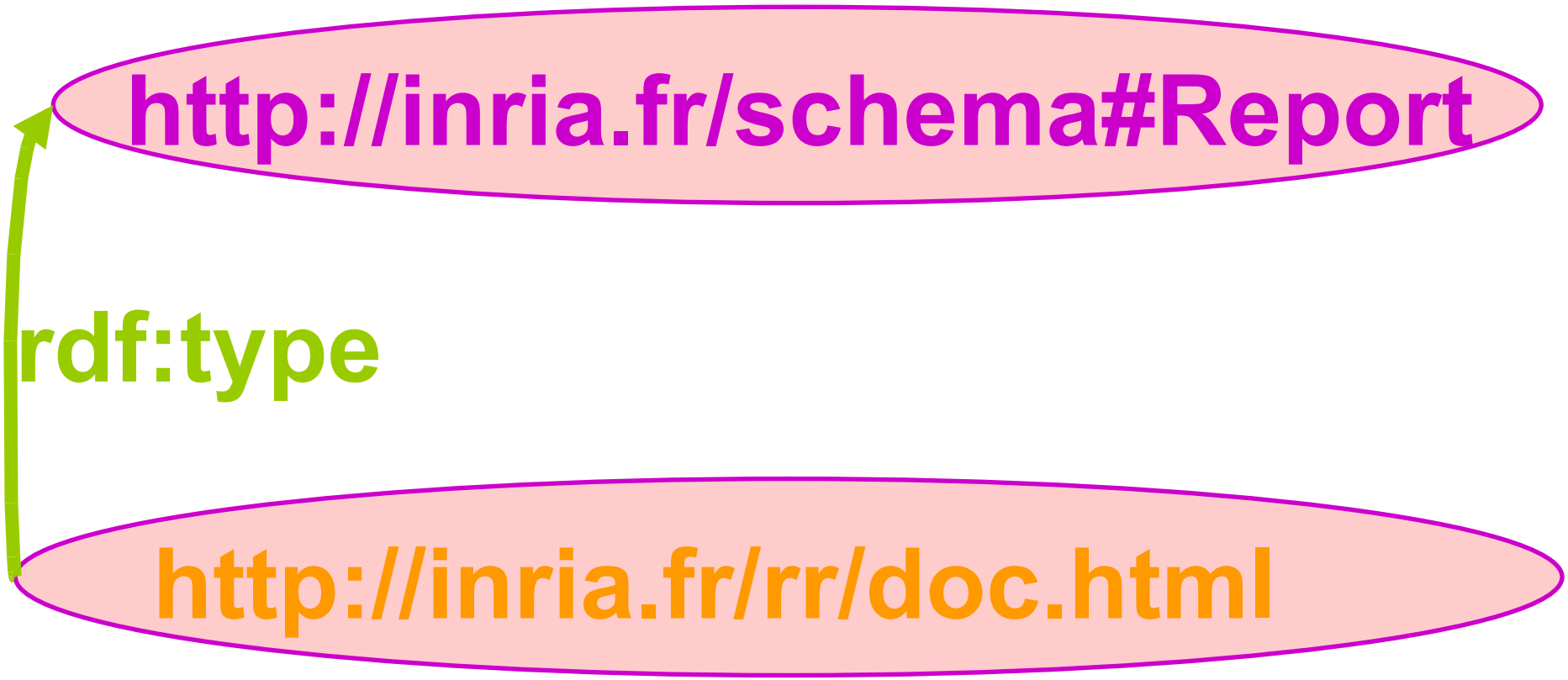
RDFa is a syntax to mix RDF and HTML inside one web page.

RDFa stands for **RDF** in HTML **attributes**

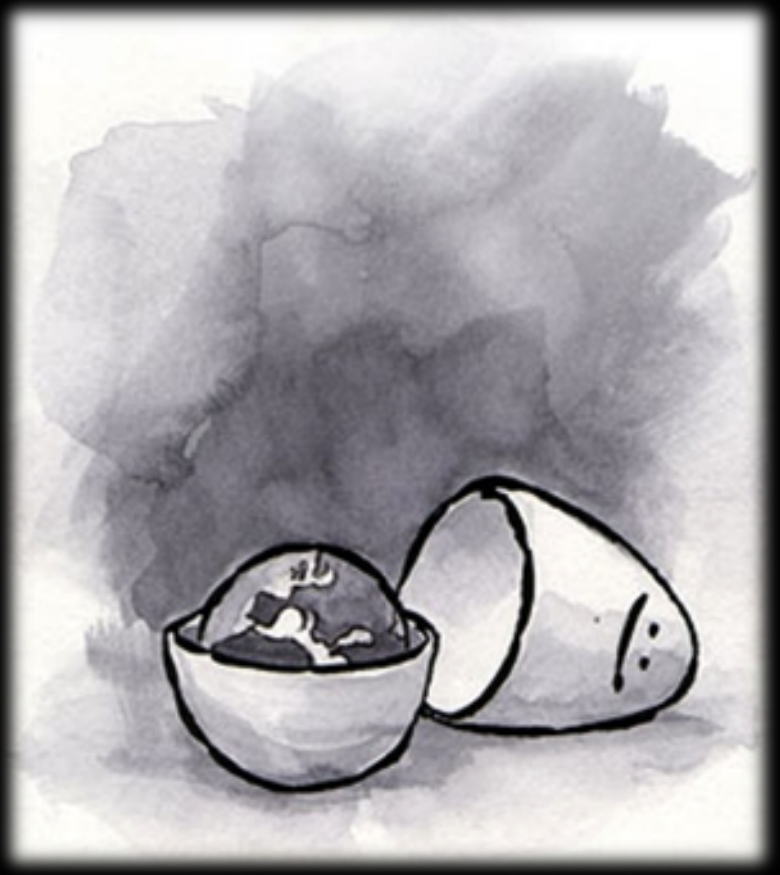
RDF has other syntaxes such as N3, Turtle and N-Triples.

RDF provides a primitive to give one or more types to a resource.

(doc.html , rdf:type, Report)


http://inria.fr/schema#Report
rdf:type
http://inria.fr/rr/doc.html

open-world assumption



as opposed to the closed world assumption of classical systems

in short: the *absence* of a triple is *not* significant

(**doc.html** , **author** , **Fabien**)

doesn't mean doc.html has one author

(doc.html , author , Fabien)

means doc.html has at least one author

if you have no other triples giving authors it does not *mean* they are not true.

RDF provides primitives to build containers and collections to list things

RDF containers are open, contain resources or literals, possibly duplicate,

`rdf:Bag` for unordered resources

`rdf:Seq` for ordered resources

`rdf:Alt` for alternative (values)

RDF collections are closed lists of resources or literals, possibly duplicate

`rdf:List` to start the list

`rdf:first` and **`rdf:rest`** to list

`rdf:nil` to end the list

doc.html has for chapters :

1, Classical

2, Pop

3, Rock

(doc.html, hasChapter, _:a)

(_:a , rdf:first, Classical)

(_:a , rdf:rest, _:b)

(_:b , rdf:first , Pop)

(_:b , rdf:rest, _:c)

(_:c , rdf:first , Rock)

(_:c , rdf:rest, rdf:nil)

RDF about RDF

reification of statements to allow statements about statements.

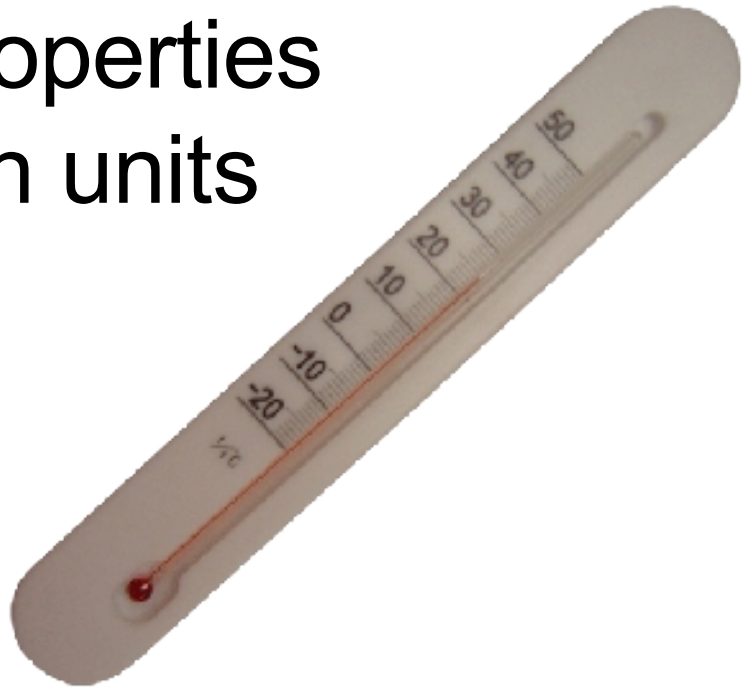
Fabien says
"doc.html has for theme Music"

(Fabien , say, triple87)

(triple87 , rdf:subject , doc.html)
(triple87 , rdf:predicate , theme)
(triple87 , rdf:object , "Music")

(triple87,rdf:type,rdf:Statement)

RDF provides primitives to give structured values to properties
e.g., to give values with units



doc.html has for length 262144 characters

(doc.html , length , _:a)

(_:a , rdf:value , "262144")

(_:a , units , characters)

take home
summary

RDF is a triple model

(SUBJECT, PREDICATE, OBJECT)

to add metadata to the web

RDF enables you to open your data

to applications

through the web


fabien, gandon