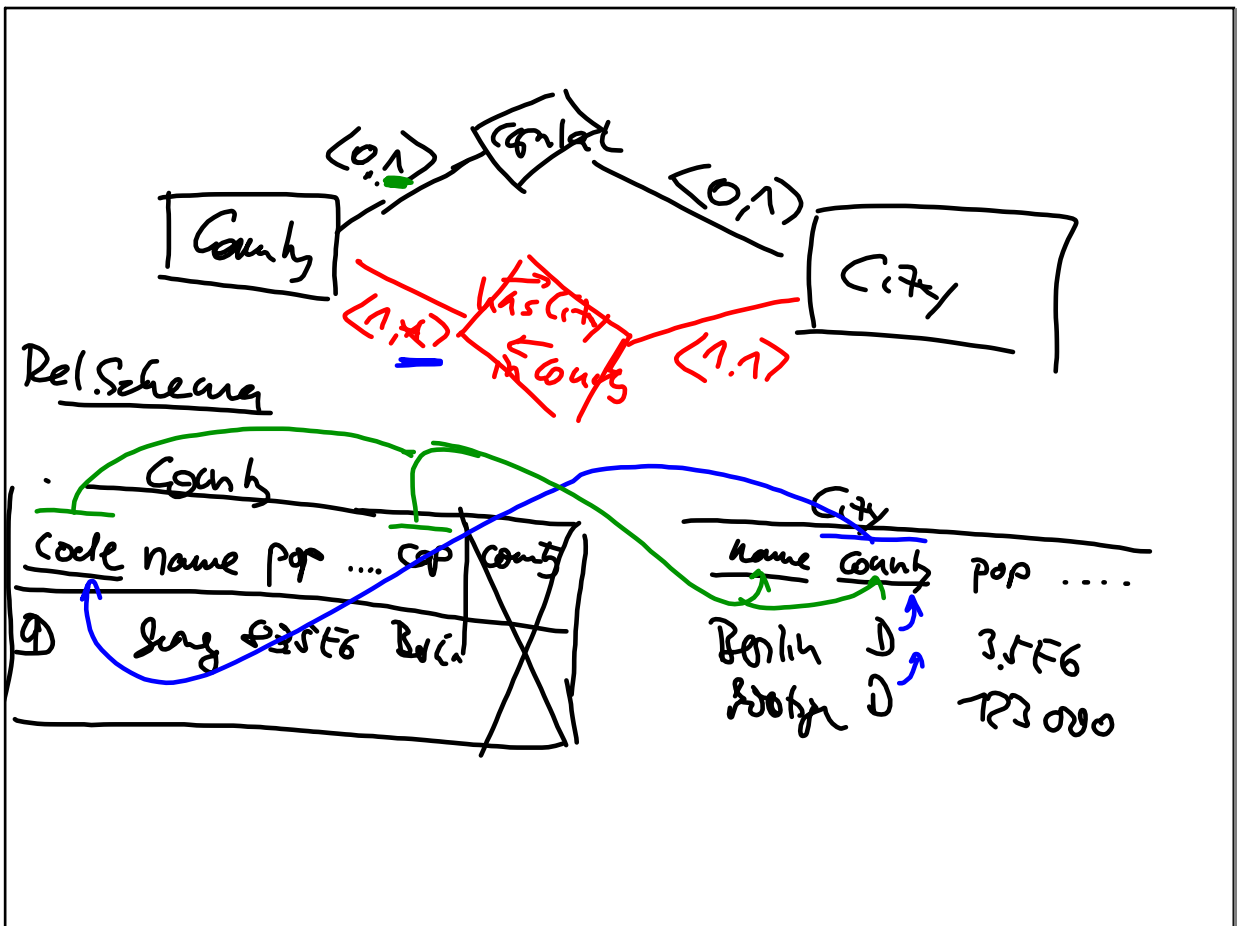


Data Models

- conceptual:
 - ER Model
 - UML
- logical:
 - rel. Model + SQL Datalog
 - ODM &
 - XML - RDF
- expressiveness: what can be expressed?
- usability: how can it be processed?

... What do I want to do?

Apr 29-14:06



Apr 29-14:22

- all cities with more than 1/4 of the population of the county

Select county.name, city.name, county.pop, city.pop
 from county, city

Where county.pop >= 4 * city.pop

and city.county = county.code

FK -> PK join

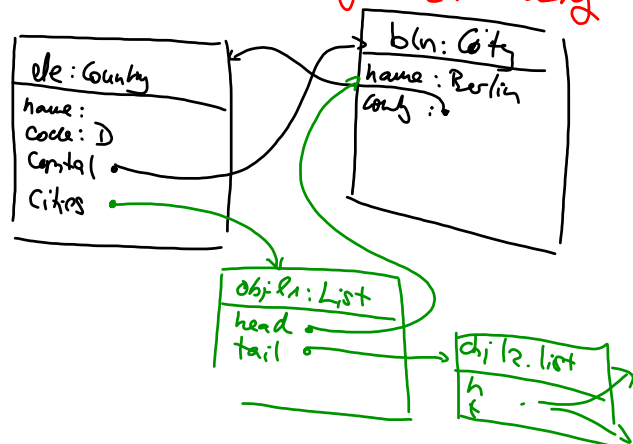
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Java/Python/C++

```
class country {
    name      string
    pop      number
    cities   collection<city>
            {get, list..}
}
```

```
class city {
}
```

Object Graph in Java Memory



Apr 29-14:30

Java (programming) = style

for (\$c in Countries) / collection of all Countries

for (\$x : \$c.cities) ← List iteration in Java
 ← join: here in the notation

if \$x.pop ≥ 0.25 \$c.population

then output

\$c.name, \$x.name, \$c.pop, \$x.pop

Apr 29-14:33

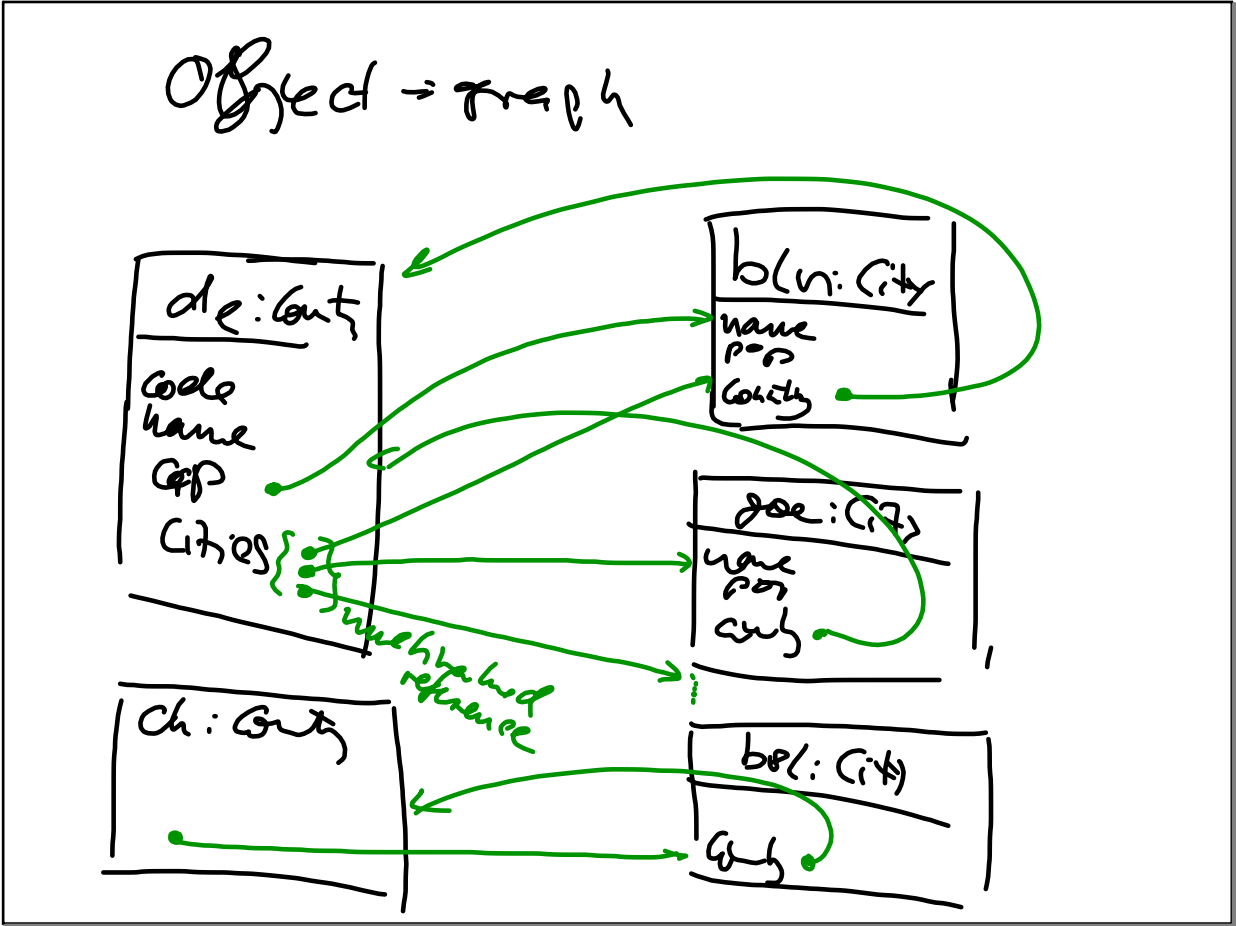
Query in OQL:

select c.name, c.pop, x.name, x.pop
 from Countries c, c has cities x
 ← correlated join how in ODI7G

where c.pop ≤ 4 * x.population
 ← implicit iteration over the set

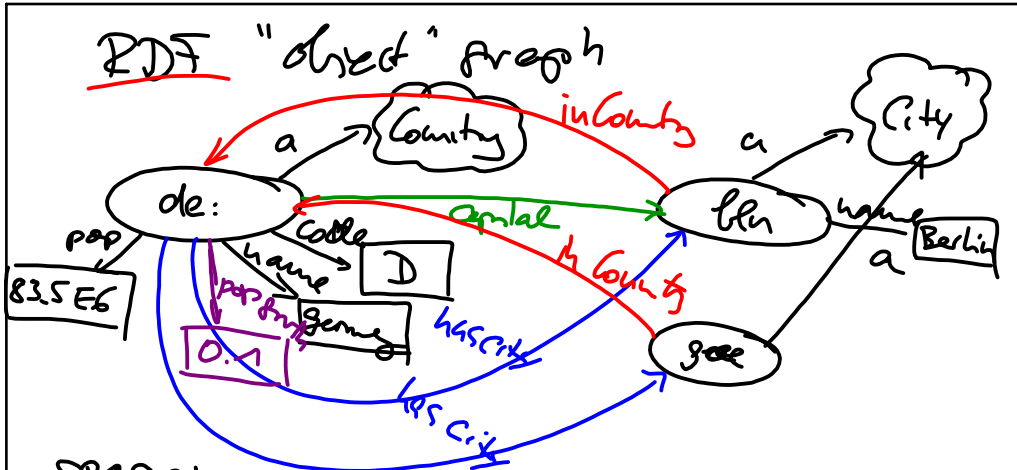
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Object → graph



Apr 29-14:47

RDF "object" graph



SPARQL

```

select ?N ?CP ?XN ?XP
where {
    ?C a Country ; name ?N ; pop ?CP ;
    hasCity ?X [ name ?XN ; pop ?XP ; ]
    FILTER
    and ( ?XP ≥ 0.25 ?CP )
}
    
```

Apr 29-14:50

"F-logic" style

$C: \text{Country} [\text{name} \rightarrow N; \text{pop} \rightarrow P; \text{hasCity} \rightarrow X]$

~~$X: \text{City} [\text{pop} \rightarrow XP; \text{home} \rightarrow XN]$~~
 $XP \geq 0.25 CP$

Apr 29-14:57

F(L)WR

```

for $c in //country
let $cp := $c.population
for $c in $c/city
where $c/population >= 0.25*$cp
return (: construct XML! :)
<bla>
<countryname>{$c/name}</>
...
<part1>{$c/population}</>
<bla>
    
```

end up in a closed language

Apr 29-15:01

Schema SQL (Sl. 74)

• all (tablename, colname) in ~~Mandiel~~ ^{all DBs}

counts	name
col ₁	col ₁
col ₂	col ₂

select d, tn, cn
 from ~~d, mandiel~~ → tn, ^d~~mandiel~~::tn → cn

Apr 29-15:11