SPARQL Query Language

Aggregates

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Outline (Slides based on F. Freitas, Cin/UFPE, Brazil)

1. Basic queries
2. Constraints
3. **Aggregation**
4. Graphs
5. Query Forms
6. SPARQL in Fuseki

Aggregates: Count Items

```
@prefix ex: <http://example.org/> .

ex:lemonade1    ex:price 3 ;
                rdf:type ex:Softdrink.
ex:beer1        ex:price 3;
                rdf:type ex:Beer.
ex:wine1        ex:price 3.50 ;
                rdf:type ex:Wine.
ex:wine2        ex:price 4 .
                rdf:type ex:Wine.
ex:wine3        ex:price "n/a";
                rdf:type ex:Wine.
```

```
PREFIX ex: <http://example.org/>
SELECT (Count(?Item) AS ?C)
WHERE { ?Item ex:price ?Pr }
```

Results:

?C
5

Aggregates: Count Categories

```
@prefix ex: <http://example.org/> .

ex:lemonade1    ex:price 3 ;
                rdf:type ex:Softdrink.
ex:beer1        ex:price 3;
                rdf:type ex:Beer.
ex:wine1        ex:price 3.50 ;
                rdf:type ex:Wine.
ex:wine2        ex:price 4 .
                rdf:type ex:Wine.
ex:wine3        ex:price "n/a";
                rdf:type ex:Wine.
```

```
PREFIX ex: <http://example.org/>
SELECT (Count(DISTINCT ?T) AS ?C)
WHERE { ?Item rdf:type ?T }
```

Results:

?C
3

Aggregates: Count Items per Categories

```
@prefix ex: <http://example.org/> .

ex:lemonade1    ex:price 3 ;
                rdf:type ex:Softdrink.
ex:beer1        ex:price 3;
                rdf:type ex:Beer.
ex:wine1        ex:price 3.50 ;
                rdf:type ex:Wine.
ex:wine2        ex:price 4 .
                rdf:type ex:Wine.
ex:wine3        ex:price "n/a";
                rdf:type ex:Wine.
```

```
PREFIX ex: <http://example.org/>
SELECT ?T (Count(?Item) AS ?C)
WHERE { ?Item rdf:type ?T }
GROUP BY ?T
```

Results:

?T	?C
Softdrink	1
Beer	1
Wine	3

Aggregates: Count Items per Categories

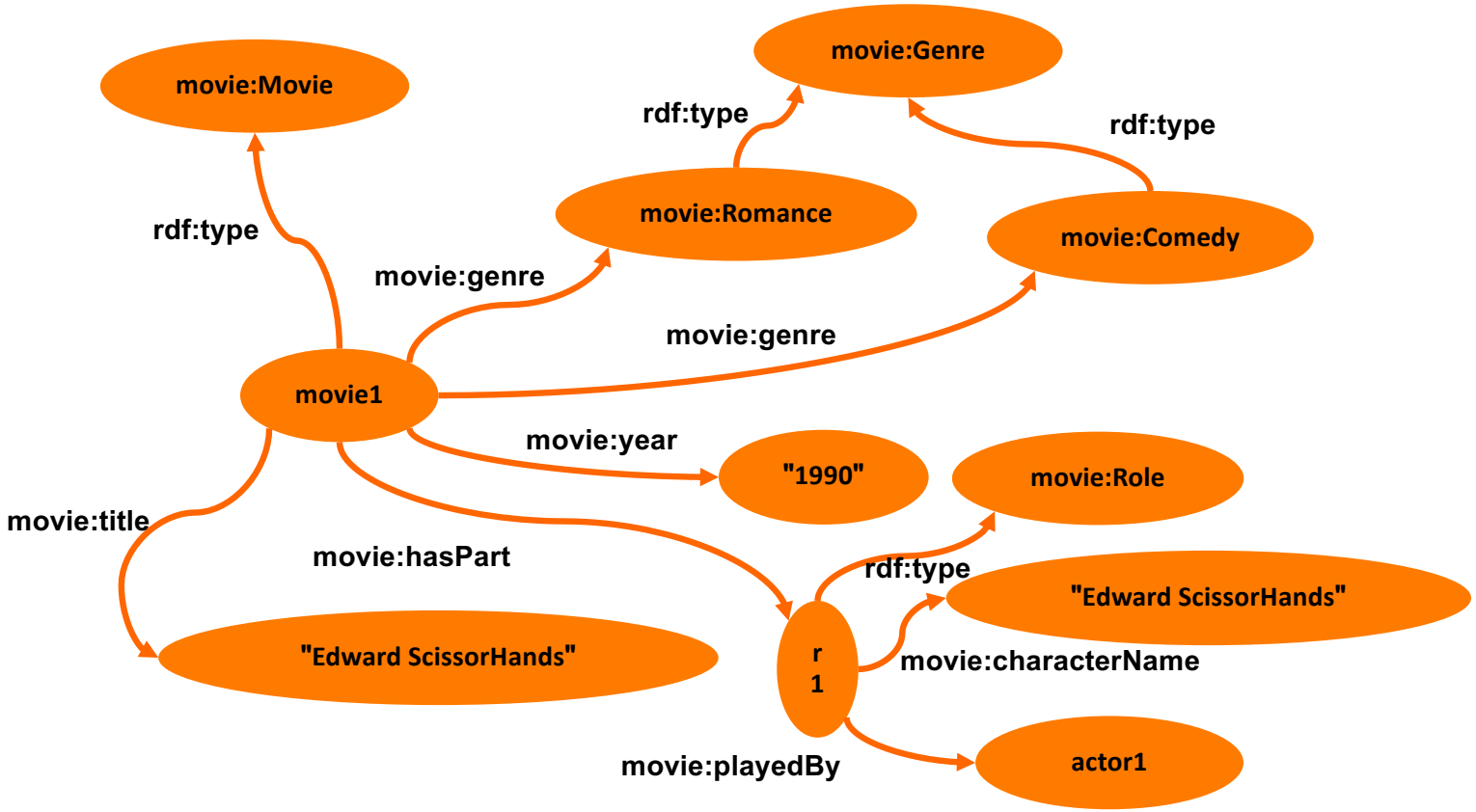
```
@prefix ex: <http://example.org/> .

ex:lemonade1    ex:price 3 ;
                rdf:type ex:Softdrink.
ex:beer1        ex:price 3;
                rdf:type ex:Beer.
ex:wine1        ex:price 3.50 ;
                rdf:type ex:Wine.
ex:wine2        ex:price 4 .
                rdf:type ex:Wine.
ex:wine3        ex:price "n/a";
                rdf:type ex:Wine.
```

```
PREFIX ex: <http://example.org/>
SELECT ?T (Count(?Item) AS ?C)
WHERE { ?Item rdf:type ?T }
GROUP BY ?T
HAVING Count(?Item) > 1
```

Results:

?T	?C
Wine	3

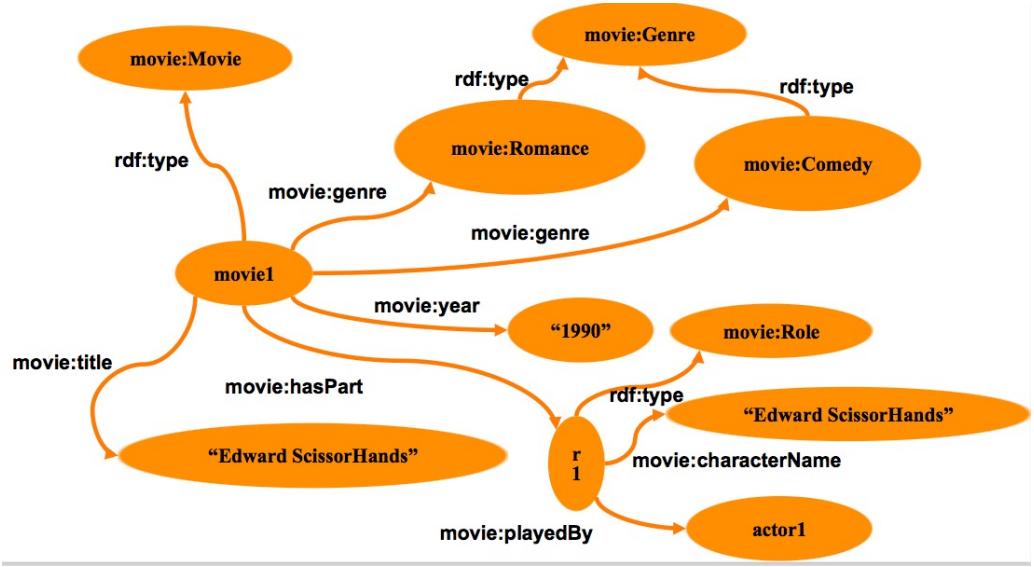
Movies Example



Example Query 1

- Select the movies that has a character called "Edward Scissorhands"

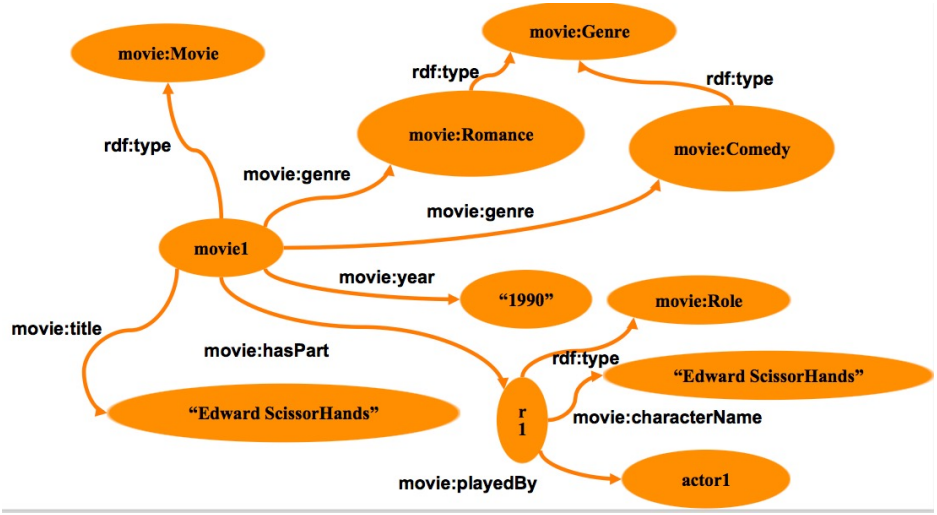
```
PREFIX movie: <http://example.org/movies/>
SELECT DISTINCT ?x ?t
WHERE { ?x movie:title ?t ; movie:hasPart ?y .?y  movie:characterName ?z .
        FILTER (?z = "Edward ScissorHands"@en)}
```



Example Query 2

- Find all movies which share at least one genre with "Gone with the Wind"

```
PREFIX movie: <http://example.org/movies/>
SELECT DISTINCT ?x2 ?t2
WHERE { ?x1 movie:title ?t1. ?x1 movie:genre ?g1. ?x2 movie:genre ?g2.
        ?x2 movie:title ?t2.
        FILTER (?t1 = "Gone with the Wind"@en && ?x1!=?x2 && ?g1==?g2)}
```



Example Query 3

- Create a graph of actors and relate them to the movies they play in (through a new ‘playsInMovie’ relation)

```
PREFIX movie: <http://example.org/movies/>
PREFIX foaf:   <http://xmlns.com/foaf/0.1/>

CONSTRUCT { ?x movie:playInMovie ?m
          }
WHERE  {
          ?m movie:title ?t ;
             movie:hasPart ?y .
          ?y movie:playedBy ?x .
          ?x foaf:firstName ?fname.
          ?x foaf:lastName ?lname.
}
```

Other Aggregates

- SUM *… as usual*
- AVG *… as usual*
- MIN *… as usual*
- MAX *… as usual*
- SAMPLE *… "pick" one non-deterministically*
- GROUP_CONCAT *… concatenate values with a designated separator string*

…this list is extensible *… new built-ins will need to define error-behaviour, extra-parameters (like SEPARATOR in GROUP_CONCAT)*