

# Training Day11

## Report:

27 June 2024

Keys Takeways:

### 1. Uploading Data to Fuseki in CSV Form

- **Convert CSV to RDF**

- CSV files need to be converted into an RDF format because Fuseki accepts RDF data.
- Use tools like csv2rdf or a custom script to convert CSV data into RDF.

- **Example Conversion Script Using Python**

- Use the rdflib library in Python to convert CSV to RDF.
- Example:

```
python
Copy code
import csv
from rdflib import Graph, Literal, RDF, URIRef, Namespace
from rdflib.namespace import XSD
```

```
g = Graph()
ns1 = Namespace("http://example.org/")
```

```
with open('data.csv', 'r') as csvfile:
    reader = csv.DictReader(csvfile)
    for row in reader:
        person = URIRef(ns1 + row['id'])
        g.add((person, ns1.name, Literal(row['name'])))
        g.add((person, ns1.age, Literal(row['age'],
                                         datatype=XSD.integer))))
```

```
g.serialize(destination='out.rdf', format='xml')
```

- **Upload RDF Data to Fuseki**

- Access the Fuseki web interface.
- Navigate to the "Add Data" section.
- Select the RDF file and upload it.
- Example: out.rdf

## 2. Performing SPARQL Queries on Uploaded Data

- **Retrieve All Triples**

- Query:

```
sparql
Copy code
SELECT ?subject ?predicate ?object
WHERE {
  ?subject ?predicate ?object.
}
```

- **Explanation:** This query retrieves all triples in the dataset.

- **Retrieve Names and Ages**

- Query:

```
sparql
Copy code
PREFIX ns1: <http://example.org/>

SELECT ?name ?age
WHERE {
  ?person ns1:name ?name ;
    ns1:age ?age .
}
```

- **Explanation:** This query retrieves the name and age for each individual.

- **Filter Individuals by Age**

- Query:

```
sparql
Copy code
PREFIX ns1: <http://example.org/>

SELECT ?name
WHERE {
  ?person ns1:name ?name ;
    ns1:age ?age .
  FILTER(?age > 5)
}
```

- **Explanation:** This query retrieves the names of individuals who are older than 5 years.

- **Count the Number of Individuals**

- Query:

```
sparql
Copy code
PREFIX ns1: <http://example.org/>
```

```
SELECT (COUNT(?person) AS ?numberOfIndividuals)
WHERE {
    ?person ns1:name ?name .
}
```

- **Explanation:** This query counts the total number of individuals in the dataset.

- **Retrieve Individuals with a Specific Name**

- Query:

```
sparql
Copy code
PREFIX ns1: <http://example.org/>
```

```
SELECT ?person ?age
WHERE {
    ?person ns1:name "f" ;
        ns1:age ?age .
}
```

- **Explanation:** This query retrieves individuals whose name is "f" and their ages.

- **Retrieve Individuals Grouped by Age**

- Query:

```
sparql
Copy code
PREFIX ns1: <http://example.org/>
```

```
SELECT ?age (COUNT(?person) AS ?count)
WHERE {
    ?person ns1:age ?age .
}
GROUP BY ?age
```

- **Explanation:** This query groups individuals by age and counts how many individuals are in each age group.

- **Retrieve Individuals with Names Starting with a Specific Letter**

- Query:

```
sparql
Copy code
PREFIX ns1: <http://example.org/>
```

```
SELECT ?name
WHERE {
  ?person ns1:name ?name .
  FILTER(STRSTARTS(?name, "s"))
}
```

- **Explanation:** This query retrieves the names of individuals whose names start with the letter "s".

- **Retrieve Individuals with Ages in a Specific Range**

- Query:

```
sparql
Copy code
PREFIX ns1: <http://example.org/>
```

```
SELECT ?name ?age
WHERE {
  ?person ns1:name ?name ;
    ns1:age ?age .
  FILTER(?age >= 4 && ?age <= 7)
}
```

- **Explanation:** This query retrieves the names and ages of individuals whose ages are between 4 and 7, inclusive.

- **Retrieve the Youngest Individual**

- Query:

```
sparql
Copy code
PREFIX ns1: <http://example.org/>
```

```
SELECT ?name ?age
WHERE {
  ?person ns1:name ?name ;
    ns1:age ?age .
}
ORDER BY ?age
```

LIMIT 1

- **Explanation:** This query retrieves the name and age of the youngest individual.

- **Retrieve the Oldest Individual**

- Query:

```
sparql
Copy code
PREFIX ns1: <http://example.org/>
```

```
SELECT ?name ?age
WHERE {
  ?person ns1:name ?name ;
          ns1:age ?age .
}
ORDER BY DESC(?age)
LIMIT 1
```

- **Explanation:** This query retrieves the name and age of the oldest individual.