Urban Waste Management System - SPARQL Queries

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Competency Question 1 (CQ1)

Question: What type of waste is currently contained in Bin_001, and what is its fill level?

SPARQL Code:

```
PREFIX : <http://www.semanticweb.org/asus/ontologies/2026/1/untitled-ontology-4#>
SELECT ?waste ?fillLevel
WHERE {
  :Bin_001 :containsWaste ?waste .
  :Bin_001 :currentFillLevel ?fillLevel .
}
```

Query Results

Waste Type	Fill Level (%)
Batch_Plastic_99	**80% (Warning)**

Competency Question 2 (CQ2)

Question: Which processing facility is Truck_A delivering to, and what route is it following?

SPARQL Code:

```
PREFIX : <http://www.semanticweb.org/asus/ontologies/2026/1/untitled-ontology-4#>
SELECT ?facility ?route
WHERE {
  :Truck_A :deliversTo ?facility .
  :Truck_A :followsRoute ?route .
}
```

Query Results

Processing Facility	Assigned Route
City_Recycling_Center	Route_1A

Competency Question 3 (CQ3)

Question: What is the maximum vehicle capacity of the truck assigned to Route_1A?

SPARQL Code:

```
PREFIX : <http://www.semanticweb.org/asus/ontologies/2026/1/untitled-ontology-4#>
SELECT ?truck ?capacity
WHERE {
  ?truck :followsRoute :Route_1A .
  ?truck :vehicleCapacity ?capacity .
}
```

Query Results

Collection Truck	Max Capacity
Truck_A	5,000

Operational Query 1 (Filtering Data Properties)

Question: Which bins are currently at a critical capacity (over 75% full)?

SPARQL Code:

```
PREFIX : <http://www.semanticweb.org/asus/ontologies/2026/1/untitled-ontology-4#>
SELECT ?bin ?fillLevel
WHERE {
  ?bin :currentFillLevel ?fillLevel .
  FILTER(?fillLevel > 75)
}
```

Query Results

Bin ID	Current Fill Level (%)
Bin_001	80% (Warning)

Operational Query 2 (Filtering by Capacity)

Question: Which collection trucks have a maximum capacity of 5000 or greater?

SPARQL Code:

```
PREFIX : <http://www.semanticweb.org/asus/ontologies/2026/1/untitled-ontology-4#>
SELECT ?truck ?capacity
WHERE {
  ?truck :vehicleCapacity ?capacity .
  FILTER(?capacity >= 5000)
}
```

Query Results

Truck ID	Capacity
Truck_A	5,000