

SPARQL Queries for Jupiter in the Solar System

RDF Data for Jupiter

Here is the RDF data for the planet Jupiter:

```
:Jupiter rdf:type :Planet ;
  rdfs:label "Jupiter" ;
  :colorPlanet [ rdf:_1 "Brown and White" ; rdf:_2 "Orange" ] ;
  :atmosphericComposition [ rdf:_1 "Hydrogen" ; rdf:_2 "Helium" ] ;
  :mass 1898 ;
  :diameter 139820 ;
  :density 1326 ;
  :surfaceGravity 24.8 ;
  :escapeVelocity 59.5 ;
  :rotationPeriod 9.9 ;
  :lengthOfDay 9.9 ;
  :distanceFromSun 778.6 ;
  :meanTemperature -110 ;
  :numberOfMoons 79 ;
  :ringSystem "Yes" ;
  :globalMagneticField "Yes" ;
  :perihelion "740.5"^^xsd:decimal ;
  :aphelion "816.6"^^xsd:decimal ;
  :orbitalPeriod "4332.6"^^xsd:decimal ;
  :orbitalVelocity "13.1"^^xsd:decimal ;
  :orbitalEccentricity "0.049"^^xsd:decimal ;
  :obliquityToOrbit "3.1"^^xsd:decimal ;
  :surfacePressure "Unknown" ;
  :surfaceTemperature "-108" ;
  :atmosphericPressure "Unknown" ;
  :surfaceFeatures [
    rdf:type rdf:Bag ;
    rdf:_1 "Storms" ;
    rdf:_2 "Belts" ;
    rdf:_3 "Zones"
  ] ;
  :composition [
    rdf:type rdf:Bag ;
    rdf:_1 "Hydrogen" ;
    rdf:_2 "Helium"
  ] .
```

SPARQL Queries

1. Which is the biggest planet?

```
PREFIX : <http://example.org/solarsystem#>

SELECT ?planetName ?diameter
WHERE {
    ?planet rdf:type :Planet ;
            rdfs:label ?planetName ;
            :diameter ?diameter .
}
ORDER BY DESC(?diameter)
LIMIT 1
```

This query retrieves the planet with the largest diameter by sorting planets in descending order of their diameter.

2. Which planet in the solar system has more than 75 moons?

```
PREFIX : <http://example.org/solarsystem#>

SELECT ?planetName ?numberOfMoons
WHERE {
    ?planet rdf:type :Planet ;
            rdfs:label ?planetName ;
            :numberOfMoons ?numberOfMoons .
    FILTER (?numberOfMoons > 75)
}
```

This query filters planets with more than 75 moons, returning the planet's name and the number of moons.

3. Which planet is made up of Hydrogen and Helium?

```
PREFIX : <http://example.org/solarsystem#>

SELECT ?planetName
WHERE {
    ?planet rdf:type :Planet ;
            rdfs:label ?planetName ;
            :composition ?composition .
    ?composition ?position ?element .
    FILTER(STR(?element) = "Hydrogen" || STR(?element) = "Helium")
}
GROUP BY ?planetName
HAVING (COUNT(DISTINCT ?element) = 2)
```

This query checks the composition of planets and filters those that contain both hydrogen and helium. The 'HAVING' clause ensures that both elements are present.