

SPARQL Queries for Solar System Dataset

Problem 1: Find the nth Smallest Planet by Diameter

```
PREFIX : <http://example.org/solarsystem\#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns\#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema\#>
SELECT ?planetLabel ?diameter
WHERE {
    ?p rdf:type :Planet ;
        :diameter ?diameter ;
        rdfs:label ?planetLabel .
    {
        SELECT ?p (COUNT(?other) AS ?rank)
        WHERE {
            ?p rdf:type :Planet ;
                :diameter ?diam .
            OPTIONAL {
                ?other rdf:type :Planet ;
                    :diameter ?otherDiam .
                FILTER(?otherDiam < ?diam)
            }
        }
        GROUP BY ?p
    }
    FILTER(?rank = 0) \# Rank 0 for the smallest planet
}
ORDER BY ?diameter
```

Problem 2: List All Planet Names with Specific Color

```
PREFIX : <http://example.org/solarsystem\#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns\#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema\#>
SELECT ?planetName
WHERE {
    ?planet rdf:type :Planet ;
        rdfs:label ?planetName ;
        :colorPlanet ?colorBag .
    ?colorBag ?position ?color .
    FILTER(?color = "X")
}
ORDER BY ?planetName
```

Problem 3: Find Planets with Specific Geological Features (Mountains, Volcanoes, Plains)

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
SELECT ?planetName ?feature
WHERE {
    ?planet rdf:type :Planet ;
            rdfs:label ?planetName ;
            :surfaceFeatures ?featureBag .
    ?featureBag ?position ?feature .
    FILTER(CONTAINS(?feature, "Mountains") ||
           CONTAINS(?feature, "Volcanoes") ||
           CONTAINS(?feature, "Plains"))
}
ORDER BY ?planetName
```

Problem 4: Find Planets Closer to the Sun Than Earth's Closest Approach

```
SELECT ?planetName ?perihelion
WHERE {
    ?planet rdf:type :Planet ;
            rdfs:label ?planetName ;
            :perihelion ?perihelion .
    :Earth :perihelion ?earthPerihelion .
    FILTER(?perihelion < ?earthPerihelion)
}
ORDER BY ?perihelion
```

Problem 5: Group Planets by Composition Types and Count Them

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
SELECT ?compositionType (COUNT(DISTINCT ?planet) as ?planetCount)
      (GROUP_CONCAT(DISTINCT ?planetName; separator=", ") as ?planets)
WHERE {
    ?planet rdf:type :Planet ;
            rdfs:label ?planetName ;
            :composition ?compBag .
    ?compBag ?pos ?compositionType .
}
GROUP BY ?compositionType
ORDER BY DESC(?planetCount)
```

Problem 6: Find the nth Coldest Planet

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?planetName ?temperature
WHERE {
    ?planet rdf:type :Planet ;
            rdfs:label ?planetName ;
            :meanTemperature ?temperature .
    {
        SELECT ?planet (COUNT(?other) AS ?rank)
        WHERE {
            ?planet rdf:type :Planet ;
                    :meanTemperature ?temp .
            OPTIONAL {
                ?other rdf:type :Planet ;
                        :meanTemperature ?otherTemp .
                FILTER(?otherTemp < ?temp)
            }
        }
        GROUP BY ?planet
    }
    # Change the number to get different ranks (0 for coldest, 1 for second coldest, etc.)
    FILTER(?rank = 1)
}
```

Problem 7: Distance Between Any Two Planets

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?planet1Name ?planet2Name
      (ABS(?dist1 - ?dist2) AS ?distanceBetween)
WHERE {
    ?planet1 rdf:type :Planet ;
            rdfs:label ?planet1Name ;
            :distanceFromSun ?dist1 .
    ?planet2 rdf:type :Planet ;
            rdfs:label ?planet2Name ;
            :distanceFromSun ?dist2 .
    FILTER(?planet1 != ?planet2)
    FILTER(?planet1Name < ?planet2Name)
```

```

}
ORDER BY ASC(?distanceBetween)

```

Problem 8: Planets with Most/Specific Moons

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?planetLabel ?moonCount
WHERE {
  ?p rdf:type :Planet ;
    :numberOfMoons ?moonCount ;
    rdfs:label ?planetLabel .
  {
    SELECT ?p (COUNT(?other) AS ?rank)
    WHERE {
      ?p rdf:type :Planet ;
        :numberOfMoons ?moons .
      OPTIONAL {
        ?other rdf:type :Planet ;
          :numberOfMoons ?otherMoons .
        FILTER(?otherMoons > ?moons && ?moons != :Nosatellite)
      }
    }
    GROUP BY ?p
  }
  FILTER(?rank = 6) # Change to get different ranks
}
ORDER BY DESC(?moonCount)

```

Problem 9: Find the nth Closest Planet to the Sun

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?planetLabel ?distanceFromSun
WHERE {
  ?p rdf:type :Planet ;
    :distanceFromSun ?distanceFromSun ;
    rdfs:label ?planetLabel .
  {
    SELECT ?p (COUNT(?other) AS ?rank)

```

```

WHERE {
  ?p rdf:type :Planet ;
      :distanceFromSun ?dist .
  OPTIONAL {
    ?other rdf:type :Planet ;
            :distanceFromSun ?otherDist .
    FILTER(?otherDist < ?dist)
  }
}
GROUP BY ?p
}
FILTER(?rank = 0)
}
ORDER BY ?distanceFromSun

```

Problem 10: Planets with Multiple Composition Types

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?planetLabel (COUNT(DISTINCT ?compositionType) AS ?compositionCount)
      (GROUP_CONCAT(DISTINCT ?compositionType; SEPARATOR=", ") AS ?compositions)
WHERE {
  ?p rdf:type :Planet ;
      rdfs:label ?planetLabel ;
      :composition ?compBag .
  ?compBag ?pos ?compositionType
}
GROUP BY ?planetLabel ?p
ORDER BY DESC(?compositionCount)

```

Problem 11: Find the Temperature Difference Between Any Two Planets

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?planet1Name ?planet2Name (ABS(?temp1 - ?temp2) AS ?tempDifference)
WHERE {
  ?planet1 rdf:type :Planet ;
            rdfs:label ?planet1Name ;
            :meanTemperature ?temp1 .
  ?planet2 rdf:type :Planet ;

```

```

        rdfs:label ?planet2Name ;
        :meanTemperature ?temp2 .
    FILTER(?planet1 != ?planet2)
    FILTER(?planet1Name < ?planet2Name)
}
ORDER BY ASC(?tempDifference)

```

Problem 12: List All Planets with a Specific Atmospheric Composition

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?planetName
WHERE {
    ?planet rdf:type :Planet ;
            rdfs:label ?planetName ;
            :atmosphericComposition ?compBag .
    ?compBag ?position ?composition .
    FILTER(CONTAINS(?composition, "X"))
}
ORDER BY ?planetName

```

Problem 13: Find the Difference in Hours Between Planets' Day Lengths

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT
    ?planet1Name
    ?planet2Name
    ?lengthOfDay1
    ?lengthOfDay2
    (ABS(?lengthOfDay1 - ?lengthOfDay2) AS ?dayLengthDifference)
WHERE {
    ?planet1 rdf:type :Planet ;
            rdfs:label ?planet1Name ;
            :lengthOfDay ?lengthOfDay1 .
    ?planet2 rdf:type :Planet ;
            rdfs:label ?planet2Name ;
            :lengthOfDay ?lengthOfDay2 .

    FILTER(?planet1 != ?planet2)
}

```

```

    FILTER(?planet1Name < ?planet2Name)
}
ORDER BY ?dayLengthDifference

```

Problem 14: Count Number of Moons Per Planet

```

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

SELECT ?planet (COUNT(?moon) AS ?moonCount)
WHERE {
    ?moon :hasSatellite ?planet .
}
GROUP BY ?planet
ORDER BY DESC(?moonCount)

```

Problem 15: Planets with the Most Moons

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>

SELECT ?planet ?moonCount
WHERE {
    {
        SELECT ?planet (COUNT(?moon) AS ?moonCount)
        WHERE {
            ?moon rdf:type :satellite .
            ?moon :hasSatellite ?planet .
        }
        GROUP BY ?planet
    }

    {
        SELECT (MAX(?moonCountVal) AS ?maxMoonCount)
        WHERE {
            {
                SELECT (COUNT(?moon) AS ?moonCountVal)
                WHERE {
                    ?moon rdf:type :satellite .
                    ?moon :hasSatellite ?planetMax .
                }
                GROUP BY ?planetMax
            }
        }
    }
}

```

```

    FILTER(?moonCount = ?maxMoonCount)
}

```

Problem 16: Planets with the Most Moons

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>

SELECT ?planet ?moonCount
WHERE {
  {
    SELECT ?planet (COUNT(?moon) AS ?moonCount)
    WHERE {
      ?moon rdf:type :satellite .
      ?moon :hasSatellite ?planet .
    }
    GROUP BY ?planet
  }

  {
    SELECT (MAX(?moonCountVal) AS ?maxMoonCount)
    WHERE {
      {
        SELECT (COUNT(?moon) AS ?moonCountVal)
        WHERE {
          ?moon rdf:type :satellite .
          ?moon :hasSatellite ?planetMax .
        }
        GROUP BY ?planetMax
      }
    }
  }
  FILTER(?moonCount = ?maxMoonCount)
}

```

Problem 17: Moon with the Highest Density and Its Parent Planet

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?moon ?density ?planet
WHERE {
  ?moon rdf:type :satellite .

```



```

?moon :density ?density .
?moon :hasSatellite ?planet .

{
  SELECT (MAX(xsd:float(?densityVal)) AS ?maxDensity)
  WHERE {
    ?moon rdf:type :satellite .
    ?moon :density ?densityVal .
  }
}

FILTER(xsd:float(?density) = ?maxDensity)
}

```

Problem 18: Rank Planets Based on the Albedo Values of Their Moons

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?planetLabel (MAX(xsd:float(?albedo)) AS ?maxAlbedo)
WHERE {
  ?moon rdf:type :satellite ;
        :hasSatellite ?planet ;
        :albedo ?albedo .
  ?planet rdf:type :Planet ;
        rdfs:label ?planetLabel .
}
GROUP BY ?planetLabel
ORDER BY DESC(?maxAlbedo)

```

Problem 19: Surface Features of Mars

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>

SELECT ?feature
WHERE {
  :Mars :surfaceFeatures ?features .
  ?features ?position ?feature .
  FILTER(STRSTARTS(STR(?position), STR(rdf:_)))
}

```

Problem 20: How Many Moons Does Mars Have?

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?numberOfMoons
WHERE {
    :Mars :numberOfMoons ?numberOfMoons .
}
```

Problem 21: Which is the Red Planet in the Solar System?

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>

SELECT ?planetName
WHERE {
    ?planet :colorPlanet ?colorContainer .
    ?colorContainer ?position ?color .
    ?planet rdfs:label ?planetName .
    FILTER(STRSTARTS(STR(?color), "Red"))
}
```

Problem 22: Orbital Period of Saturn and Comparison with Earth

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

SELECT ?planetName ?orbitalPeriod
WHERE {
    VALUES ?planet { :Saturn :Earth }
    ?planet rdfs:label ?planetName ;
        :orbitalPeriod ?orbitalPeriod .
}
ORDER BY ?planetName
```

Problem 23: Main Components of Saturn's Atmosphere

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>

SELECT ?atmosphericComposition
WHERE {
    :Saturn :atmosphericComposition ?atm .
}
```

```

    ?atm ?position ?composition .
    FILTER(STRSTARTS(STR(?position), STR(rdf:_)))
}

```

Problem 24: Surface Features of Saturn

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>

SELECT ?feature
WHERE {
    :Saturn :surfaceFeatures ?features .
    ?features ?position ?feature .
    FILTER(STRSTARTS(STR(?position), STR(rdf:_)))
}

```

Problem 25: Atmospheric Composition and Mean Surface Temperature of Mercury

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>

SELECT ?atmosphericComposition ?meanTemp
WHERE {
    :Mercury :atmosphericComposition ?atm .
    :Mercury :meanTemperature ?meanTemp .
    ?atm ?position ?atmosphericComposition .
    FILTER(STRSTARTS(STR(?position), STR(rdf:_)))
}

```

Problem 26: Surface Gravity of Mercury and Comparison with Earth

```

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

SELECT ?planet ?gravity
WHERE {
    VALUES ?planet { :Mercury :Earth }
    ?planet :surfaceGravity ?gravity .
}
ORDER BY ?planet

```

Problem 27: Composition of Mercury

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>

SELECT ?position ?component
WHERE {
    :Mercury :composition ?comp .
    ?comp ?position ?component .
    FILTER(STRSTARTS(STR(?position), STR(rdf:_)))
}
ORDER BY ?position
```

Problem 28: Analyze the Size Difference Between Mars' Two Moons

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?moonName ?radius
WHERE {
    ?moon a :satellite ;
        :hasSatellite :Mars ;
        rdfs:label ?moonName ;
        :radius ?radius .
}
```

Problem 29: Names of All the Moons of Mars

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?moonName
WHERE {
    ?moon a :satellite ;
        :hasSatellite :Mars ;
        rdfs:label ?moonName .
}
```

Problem 30: Identify the Smallest and Largest Jupiter Moons

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
```

```

SELECT ?moonName ?radius
WHERE {
  {
    SELECT (MIN(?radiusValue) AS ?minRadius) (MAX(?radiusValue) AS ?maxRadius)
    WHERE {
      ?moon a :satellite ;
            :hasSatellite :Jupiter ;
            :radius ?radiusValue .
    }
  }
  ?moon a :satellite ;
        :hasSatellite :Jupiter ;
        :radius ?radius ;
        rdfs:label ?moonName .
  FILTER(?radius = ?minRadius || ?radius = ?maxRadius)
}

```

Problem 31: List All Moons of Jupiter with a Magnitude Greater Than 10

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?moonName ?magnitude
WHERE {
  ?moon a :satellite ;
        :hasSatellite :Jupiter ;
        :magnitude ?magnitude ;
        rdfs:label ?moonName .
  FILTER(xsd:decimal(?magnitude) > 10)
}

```

Problem 32: Which Moon of Saturn Has the Largest Radius?

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?moonName ?radius
WHERE {
  {
    SELECT (MAX(?radiusValue) AS ?maxRadius)
    WHERE {
      ?moon a :satellite ;
            :hasSatellite :Saturn ;

```

```

        :radius ?radiusValue .
    }
}
?moon a :satellite ;
      :hasSatellite :Saturn ;
      :radius ?radius ;
      rdfs:label ?moonName .
FILTER(?radius = ?maxRadius)
}

```

Problem 33: Find the Moon of Saturn with the Highest Magnitude

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?moonName ?magnitude
WHERE {
  {
    SELECT (MAX(xsd:decimal(?magnitude)) AS ?maxMagnitude)
    WHERE {
      ?moon a :satellite ;
            :hasSatellite :Saturn ;
            :magnitude ?magnitude .
    }
  }
  ?moon a :satellite ;
        :hasSatellite :Saturn ;
        :magnitude ?magnitude ;
        rdfs:label ?moonName .
  FILTER(xsd:decimal(?magnitude) = ?maxMagnitude)
}

```

Problem 34: Which Moon Has the Closest Density to that of Earth's Moon?

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?moonName ?density (ABS(xsd:decimal(?density) - 3.34) AS ?densityDifference)
WHERE {
  ?moon a :satellite ;
        :density ?density ;
        rdfs:label ?moonName .
}

```

```

    FILTER(xsd:decimal(?density) > 0) # To ensure the density is a positive number
}
ORDER BY ?densityDifference
LIMIT 1

```

Problem 35: Find the Moons of Neptune with an Albedo Greater Than 0.5

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?moonName ?albedo
WHERE {
    ?moon a :satellite ;
        :hasSatellite :Neptune ;
        :albedo ?albedo ;
        rdfs:label ?moonName .
    FILTER(xsd:decimal(?albedo) > 0.5)
}

```

Problem 36: Find the Moon of Neptune with the Lowest Albedo

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?moonName ?albedo
WHERE {
    {
        SELECT (MIN(xsd:decimal(?albedo)) AS ?minAlbedo)
        WHERE {
            ?moon a :satellite ;
                :hasSatellite :Neptune ;
                :albedo ?albedo .
        }
    }
    ?moon a :satellite ;
        :hasSatellite :Neptune ;
        :albedo ?albedo ;
        rdfs:label ?moonName .
    FILTER(xsd:decimal(?albedo) = ?minAlbedo)
}

```

Problem 37: List All Moons of Uranus with a Radius Less Than 100 km

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?moonName ?radius
WHERE {
    ?moon a :satellite ;
          :hasSatellite :Uranus ;
          :radius ?radius ;
          rdfs:label ?moonName .
    FILTER(xsd:decimal(?radius) < 100)
}
```

Problem 38: Count the Number of Moons of Uranus

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT (COUNT(?moon) AS ?moonCount)
WHERE {
    ?moon a :satellite ;
          :hasSatellite :Uranus .
}
```

Problem 39: 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")
}
```

Problem 40: What Are the Colors of Earth?

```
PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

SELECT ?color
```



```

WHERE {
    :Earth :colorPlanet ?colorContainer .
    ?colorContainer ?position ?color .
    FILTER(STRSTARTS(STR(?position), STR(rdf:_)))
}
GROUP BY ?planetName
HAVING (COUNT(DISTINCT ?element) = 2)

```

Problem 41: How Many Earths Could Fit Inside the Sun?

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT (ROUND(?sunVolume / ?earthVolume) AS ?earthsInSun)
WHERE {
    BIND(1.412E18 AS ?sunVolume) # Sun's volume in km³
    :Earth :diameter ?diameter .
    BIND((4 / 3) * 3.14159 * ((?diameter / 2) * (?diameter / 2) * (?diameter / 2))
    AS ?earthVolume)
}

```

Problem 42: What Are the Main Components of Uranus' Atmosphere?

```

PREFIX : <http://example.org/solarsystem#>
PREFIX rdf: <http://www.w3.org/1999/02/22/rdf-syntax-ns#>

SELECT ?component
WHERE {
    :Uranus :atmosphericComposition ?atm .
    ?atm ?position ?component .
    FILTER(STRSTARTS(STR(?position), STR(rdf:_)))
}

```