

Mercury RDF and SPARQL Queries

RDF Data for Mercury

The RDF data for Mercury is represented using the Turtle format:

```
@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#> .
:Mercury rdf:type :Planet ;
    rdfs:label "Mercury" ;
    :colorPlanet [ rdf:_1 "Gray" ] ;
    :atmosphericComposition [ rdf:_1 "Mostly None" ] ;
    :mass 0.33 ;
    :diameter 4879 ;
    :density 5427 ;
    :surfaceGravity 3.7 ;
    :escapeVelocity 4.3 ;
    :rotationPeriod 1407.6 ;
    :lengthOfDay 4222.6 ;
    :distanceFromSun 57.9 ;
    :meanTemperature 167 ;
    :numberOfMoons 0 ;
    :ringSystem "No" ;
    :globalMagneticField "Yes" ;
    :perihelion "46"^^xsd:decimal ;
    :aphelion "69.8"^^xsd:decimal ;
    :orbitalPeriod "88"^^xsd:decimal ;
    :orbitalVelocity "47.4"^^xsd:decimal ;
    :orbitalEccentricity "0.206"^^xsd:decimal ;
    :obliquityToOrbit "0.034"^^xsd:decimal ;
    :surfacePressure "0"^^xsd:decimal ;
    :surfaceTemperature "-173 to 427" ;
    :atmosphericPressure "0"^^xsd:decimal ;
    :surfaceFeatures [
        rdf:type rdf:Bag ;
        rdf:_1 "Craters" ;
        rdf:_2 "Scarps"
    ] ;
```

```

:composition [
  rdf:type rdf:Bag ;
  rdf:_1 "Iron Core" ;
  rdf:_2 "Silicate Mantle"
] .

```

Questions and SPARQL Queries

1. What are the atmospheric composition and mean surface temperature of Mercury?

SPARQL Query:

```

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:_)))
}

```

2. What is the surface gravity of Mercury, and how does it compare to Earth's?

SPARQL Query:

```

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

```

```

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

```

3. What is the composition of mercury?

SPARQL Query:

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

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