Semantic Data Generation using SPARQL

- **Which States have a spending BELOW the National average?**

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX ds: <https://data.medicare.gov/d/nrth-mfg3#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?stateName ?averageMedicareSpending ?NationAverageMedicareSpending
WHERE
{
   ?state ds:hasStateName ?stateName.
   ?state ds:hasStateAverageMedicareSpending ?averageMedicareSpending.
{
   SELECT (AVG(?medicareSpending) AS ?NationAverageMedicareSpending)
   WHERE
   {
      ?state ds:hasStateAverageMedicareSpending ?medicareSpending.
      FILTER(?medicareSpending!=0)
   }
}
   FILTER(?averageMedicareSpending < ?NationAverageMedicareSpending)
}
ORDER BY ASC(?stateName)
```

- **Which Government hospital provides emergency services?**

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
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PREFIX ds: <https://data.medicare.gov/d/nrth-mfg3#>
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PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?facility_name ?facility_address ?emergency_service ?ownership
WHERE {
  ?hospital ds:hasFacilityName ?facility_name .
  ?hospital ds:hasAddress ?facility_address .
  ?hospital ds:hasEmergencyService ?emergency_service .
        FILTER(?emergency_service = "true")
  ?hospital ds:hasEmergencyService ?emergency_service .
  ?hospital ds:hasOwnership ?ownership
  FILTER(?ownership = "Government - Federal") .
  ?hospital ds:hasOwnership ?ownership .
 }
```

- **Percentage of hospitals that have higher score than national average score?**

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
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PREFIX ds: <https://data.medicare.gov/d/nrth-mfg3#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

 SELECT ?percentage_nation
 WHERE {
    {
         SELECT (COUNT(?_id) AS ?req_hopitals)
        WHERE {
        ?subject ds:hasFacilityID ?_id .
        ?subject ds:hasHospitalAverageMedicareSpending ?hospital_spending .
        ?subject ds:hasCountry ?country .
        ?country ds:hasNationalAverageSpending ?nation_spending .
        ?subject ds:hasScore ?score .
         {
        SELECT (ROUND(AVG(?score)) AS ?avg)
           WHERE { ?hospital ds:hasScore ?score. }
         }
        FILTER(?hospital_spending > ?nation_spending && ?score > ?avg) .
          }
    }

    {
      SELECT (COUNT(?id) as ?total_hospital)
```

```
    WHERE {
      ?subject ds:hasFacilityID ?id .
      ?subject ds:hasHospitalAverageMedicareSpending ?hospital_spending .
      ?subject ds:hasCountry ?country .
      ?country ds:hasNationalAverageSpending ?nation_spending .
      FILTER(?hospital_spending > ?nation_spending)
    }
       }

  BIND(?req_hopitals/?total_hospital*100 AS ?percentage_nation)
}
```

- **Which hospital has the best ratio of spending to score?**

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
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PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX ds: <https://data.medicare.gov/d/nrth-mfg3#>


SELECT
?id?name?address?city?countyName?stateName?zipCode?stateSpending?score(?spending /
?score as ?ratio)
WHERE {
  ?hospital ds:hasFacilityID ?id.
  ?hospital ds:hasFacilityName ?name.
  ?hospital ds:hasAddress ?address.
  ?hospital ds:hasCity ?city.
  ?hospital ds:hasState ?state.
  ?state ds:hasStateName ?stateName.
  ?hospital ds:hasZipcode ?zipCode.
  ?hospital ds:hasCounty ?countyName.
  ?hospital ds:hasHospitalAverageMedicareSpending ?spending.
  ?state ds:hasStateAverageMedicareSpending ?stateSpending.
  ?hospital ds:hasScore ?score.
}
ORDER BY DESC(?ratio)
LIMIT 2
```

- **What is the most efficient state?**

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
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PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX ds: <https://data.medicare.gov/d/nrth-mfg3#>

SELECT ?stateName (ROUND(?efficient_count * 100 / ?total) AS ?percent)
?efficient_count ?total
WHERE {
 {
   # This is to find # efficent hospitals in each state
   SELECT ?stateName (COUNT(?efficient) AS ?efficient_count)
   WHERE {
     ?efficient ds:hasHospitalAverageMedicareSpending ?hSpending.
     ?efficient ds:hasScore ?hScore.
     ?efficient ds:hasState ?state.
     ?state ds:hasStateName ?stateName.
     ?state ds:hasStateAverageMedicareSpending ?sSpending.

          # This is to find out the state average score
    {
      SELECT (AVG(?innerScore) AS ?stateAvgScore)
      WHERE {
         ?hospital ds:hasState ?state.
        ?state ds:hasStateName ?stateName.
         ?hospital ds:hasScore ?innerScore.
       }
          }
```

```
    # Filter out by comparison
    FILTER(?hSpending < ?sSpending && ?hScore > ?stateAvgScore)
  }
  GROUP BY ?stateName
 }

 # This block is to find the total # hospitals in each state
 {
  SELECT ?stateName (COUNT(?hospital) AS ?total)
  WHERE {
     ?hospital ds:hasState ?state.
       ?state ds:hasStateName ?stateName.
  }
  GROUP BY (?stateName)
 }
}
ORDER BY DESC(?percent)
```