Hands On: Network Connectedness and Clustering Components Reading | Coursera

Hands On: Network Connectedness and Clustering Components

1. Create a new graph by adding the Continents dataset
2. Import the GraphStream library
3. Import countriesGraph into a GraphStream SingleGraph
4. Visualize countriesGraph
5. Visualize Facebook graph

Create a new graph by adding the Continents dataset

To make the graph more interesting, create a new graph and add the continents.

input:

```
Source.fromFile("./EOADATA/continent.csv").getLines().take(5).foreach(println
)
```

output:

```
#continent_id,name
1,Asia
2,Africa
3,North America
4,South America
```

input:

```
Source.fromFile("./EOADATA/country_continent.csv").getLines().take(5).foreach
(println)
```

output:

```
#country_id,continent_id
1,1
2,1
```

```
3,1
4,1
```

input:

```
case class Continent(override val name: String) extends PlaceNode(name)
```

output:

```
defined class Continent
```

input:

```
val continents: RDD[(VertexId, PlaceNode)] =
  sc.textFile("./EOADATA/continent.csv").
    filter(! _.startsWith("#")).
    map {line =>
      val row = line split ','
      (200L + row(0).toInt, Continent(row(1))) // Add 200 to the VertexId to
keep the indexes unique
    }
```

output:

```
continents: org.apache.spark.rdd.RDD[(org.apache.spark.graphx.VertexId,
PlaceNode)] = MapPartitionsRDD[106] at map at <console>:42
```

input:

```
val cclinks: RDD[Edge[Int]] =
  sc.textFile("./EOADATA/country_continent.csv").
    filter(! _.startsWith("#")).
    map {line =>
      val row = line split ','
      Edge(100L + row(0).toInt, 200L + row(1).toInt, 1)
    }
```

output:

```
cclinks: org.apache.spark.rdd.RDD[org.apache.spark.graphx.Edge[Int]] =
```

```
MapPartitionsRDD[110] at map at <console>:39
```

Concatenate the three sets of nodes into a single RDD.

input:

```
val cnodes = metros ++ countries ++ continents
```

output:

```
cnodes: org.apache.spark.rdd.RDD[(org.apache.spark.graphx.VertexId,
PlaceNode)] = UnionRDD[112] at $plus$plus at <console>:49
```

Concatenate the two sets of edges

input:

```
val clinks = mclinks ++ cclinks
```

output:

```
clinks: org.apache.spark.rdd.RDD[org.apache.spark.graphx.Edge[Int]] =
UnionRDD[113] at $plus$plus at <console>:40
```

input:

```
val countriesGraph = Graph(cnodes, clinks)
```

output:

```
countriesGraph: org.apache.spark.graphx.Graph[PlaceNode,Int] =
org.apache.spark.graphx.impl.GraphImpl@c5afb2f
```

Import the GraphStream library

Import the GraphStream library

```
import org.graphstream.graph.implementations._
```

Create a new instance of GraphStream's SingleGraph class using the

countriesGraph.

```
val graph: SingleGraph = new SingleGraph("countriesGraph")
```

Set up the visual attributes for graph visualization.

```
graph.addAttribute("ui.stylesheet","url(file:.//style/stylesheet)")
graph.addAttribute("ui.quality")
graph.addAttribute("ui.antialias")
```

Load the graphX vertices into GraphStream nodes.

```
for ((id:VertexId, place:PlaceNode) <- countriesGraph.vertices.collect())
{
  val node = graph.addNode(id.toString).asInstanceOf[SingleNode]
  node.addAttribute("name", place.name)
  node.addAttribute("ui.label", place.name)

  if (place.isInstanceOf[Metro])
    node.addAttribute("ui.class", "metro")
  else if(place.isInstanceOf[Country])
    node.addAttribute("ui.class", "country")
  else if(place.isInstanceOf[Continent])
    node.addAttribute("ui.class", "continent")
}
```

Load the graphX edges into GraphStream edges.

```
for (Edge(x,y,_) <- countriesGraph.edges.collect()) {
  graph.addEdge(x.toString ++ y.toString, x.toString, y.toString,
true).asInstanceOf[AbstractEdge]
}
```

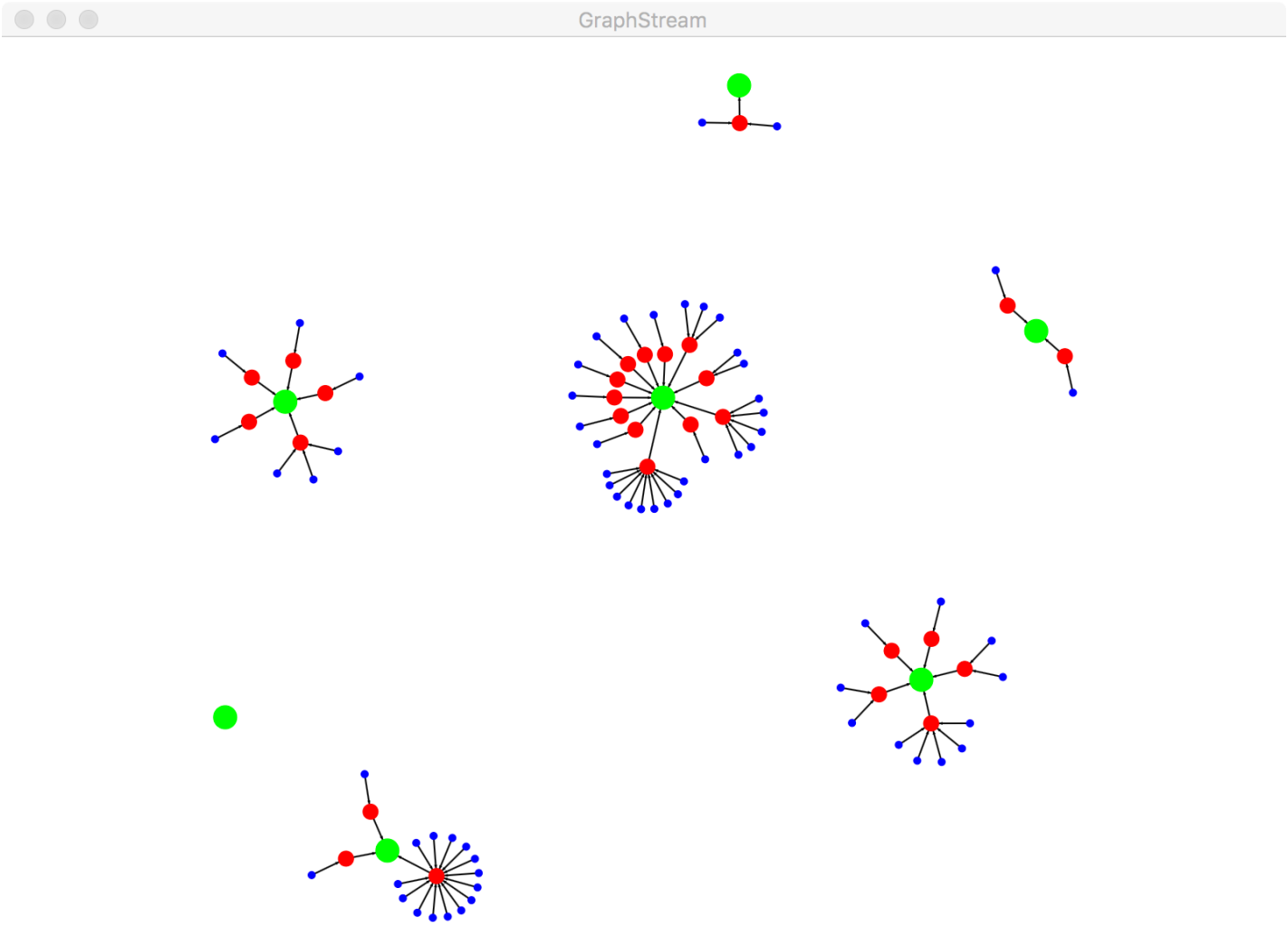
Display the graph.

The metros are the small blue dots, the countries are the medium red dots and the continents are the large green dots.

input:

```
graph.display()
```

output:



Visualize Facebook graph

Open a terminal in the Cloudera Quick Start virtual machine by clicking **Applications**, **System Tools** then **Terminal**.

Type the following command in the Terminal window to go into the ExamplesOfAnalytics directory.

```
cd ExamplesOfAnalytics
```

Run the spark-shell with the Facebook.scala file to visualize the Facebook dataset.

```
spark-shell --jars lib/gs-core-1.2.jar,lib/gs-ui-1.2.jar,lib/jcommon-
1.0.16.jar,lib/jfreechart-1.0.13.jar,lib/breeze_2.10-0.9.jar,lib/breeze-
viz_2.10-0.9.jar,lib/pherd-1.0.jar -i Facebook.scala
```

output: