

UNIVERSIDAD POLITECNICA SALESIANA

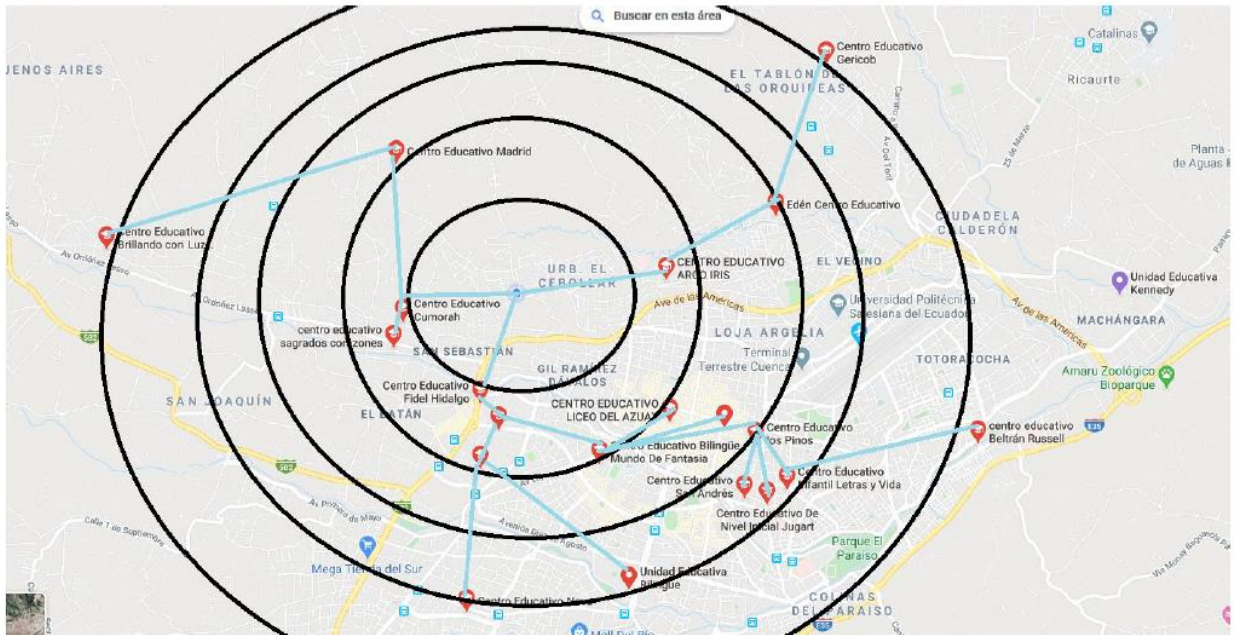
Nombre: Bryam Gabriel Mora Lituma

Carrera: Ingeniería de Sistemas

Materia: Inteligencia Artificial

Fecha: 10/02/2021

1. Emplear la herramienta Google Maps con las coordenadas antes indicadas.



2. Especificar como punto de partida y el objetivo.

Punto de partida: CASA.

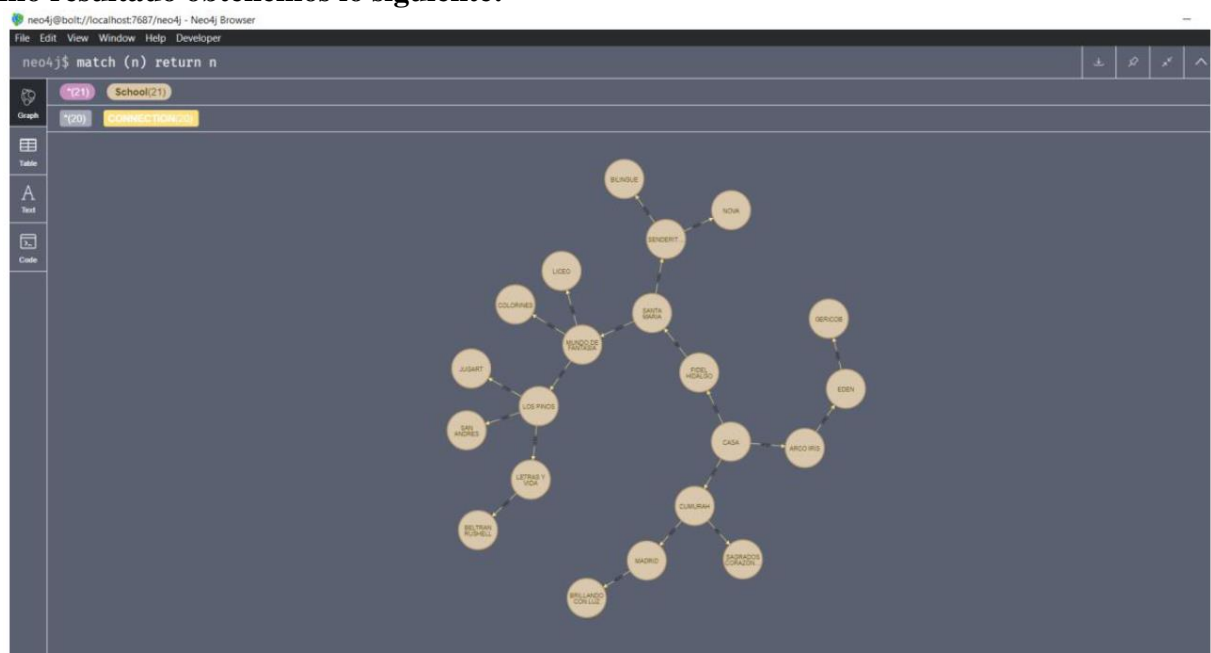
Objetivo: BELTRAN RUSHELL.

3. Primero creamos los nodos y las relaciones con las siguientes sentencias.

```
CREATE (a:School {name: 'CASA', latitude: -2.884226, longitude: -79.021121}),
(b:School {name: 'CUMURAH', latitude: -2.886707, longitude: -79.033513}),
(c:School {name: 'SAGRADOS CORAZONES', latitude: -2.890037, longitude: -79.034987}),
(d:School {name: 'MADRID', latitude: -2.872449, longitude: -79.032822}),
(e:School {name: 'BRILLANDO CON LUZ PROPIA', latitude: -2.880667, longitude: -79.060825}),
(f:School {name: 'ARCO IRIS', latitude: -2.883768, longitude: -79.005780}),
(g:School {name: 'EDEN', latitude: -2.877280, longitude: -78.995242}),
(h:School {name: 'GERICOB', latitude: -2.862431, longitude: -78.987303}),
(j:School {name: 'FIDEL HIDALGO', latitude: -2.895052, longitude: -79.026132}),
(k:School {name: 'SANTA MARIA', latitude: -2.898138, longitude: -79.022356}),
(l:School {name: 'SENDERITOS DEL SABER', latitude: -2.902596, longitude: -79.024845}),
(m:School {name: 'NOVA', latitude: -2.914854, longitude: -79.024845}),
(n:School {name: 'BILINGUE', latitude: -2.913739, longitude: -79.010597}),
(o:School {name: 'MUNDO DE FANTASIA', latitude: -2.900967, longitude: -79.014030}),
(p:School {name: 'LICEO', latitude: -2.896767, longitude: -79.004846}),
(q:School {name: 'COLORINES', latitude: -2.898738, longitude: -78.998666}),
(r:School {name: 'LOS PINOS', latitude: -2.900710, longitude: -78.996521}),
(s:School {name: 'SAN ANDRES', latitude: -2.905082, longitude: -78.998924}),
(t:School {name: 'JUGART', latitude: -2.905767, longitude: -78.996349}),
(u:School {name: 'LETRAS Y VIDA', latitude: -2.901990, longitude: -78.994786}),
(v:School {name: 'BELTRAN RUSHELL', latitude: -2.899323, longitude: -78.977464}),
(a)-[:CONNECTION {cost: 310}]->(b),
(a)-[:CONNECTION {cost: 410}]->(f),
(a)-[:CONNECTION {cost: 320}]->(j),
```

(b)-[:CONNECTION {cost: 40}]->(c),
(b)-[:CONNECTION {cost: 460}]->(d),
(d)-[:CONNECTION {cost: 830}]->(e),
(j)-[:CONNECTION {cost: 90}]->(k),
(k)-[:CONNECTION {cost: 100}]->(l),
(k)-[:CONNECTION {cost: 300}]->(o),
(l)-[:CONNECTION {cost: 400}]->(m),
(l)-[:CONNECTION {cost: 530}]->(n),
(o)-[:CONNECTION {cost: 200}]->(p),
(o)-[:CONNECTION {cost: 460}]->(r),
(o)-[:CONNECTION {cost: 390}]->(q),
(r)-[:CONNECTION {cost: 190}]->(s),
(r)-[:CONNECTION {cost: 230}]->(t),
(r)-[:CONNECTION {cost: 310}]->(u),
(u)-[:CONNECTION {cost: 580}]->(v),
(f)-[:CONNECTION {cost: 390}]->(g),
(g)-[:CONNECTION {cost: 460}]->(h);

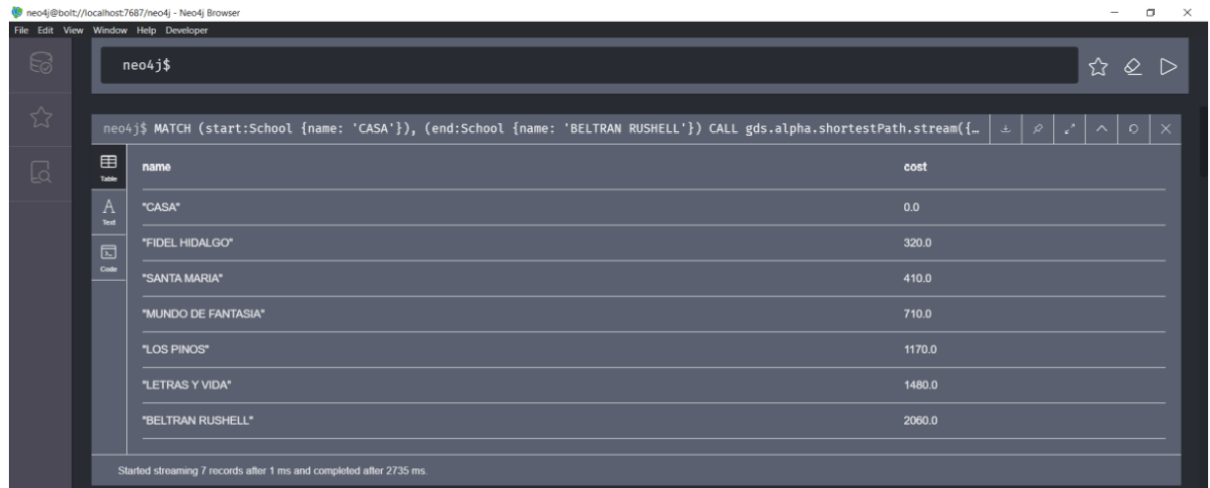
4. Como resultado obtenemos lo siguiente:



5. Para obtener el camino o ruta más corta se usará la siguiente sentencia:

```
MATCH (start:School {name: 'CASA'}), (end:School {name: 'BELTRAN RUSHELL'})
CALL gds.alpha.shortestPath.stream({
  nodeProjection: 'School',
  relationshipProjection: {
    ROAD: {
      type: 'CONNECTION',
      properties: 'cost',
      orientation: 'UNDIRECTED'
    }
  },
  startNode: start,
  endNode: end,
  relationshipWeightProperty: 'cost'
})
YIELD nodeId, cost
RETURN gds.util.asNode(nodeId).name AS name, cost
```

6. Y como resultado obtenemos lo siguiente.



The screenshot shows the Neo4j Browser interface. The top bar indicates the connection to 'neo4j@bolt://localhost:7687/neo4j - Neo4j Browser'. The left sidebar contains icons for home, star, and a document. The main area displays a Cypher query in the editor:

```
neo4j$ MATCH (start:School {name: 'CASA'}), (end:School {name: 'BELTRAN RUSHELL'}) CALL gds.alpha.shortestPath.stream(...)
```

Below the query, the results are shown in a table with two columns: 'name' and 'cost'.

name	cost
"CASA"	0.0
"FIDEL HIDALGO"	320.0
"SANTA MARIA"	410.0
"MUNDO DE FANTASIA"	710.0
"LOS PINOS"	1170.0
"LETRAS Y VIDA"	1480.0
"BELTRAN RUSHELL"	2060.0

At the bottom, a status message reads: 'Started streaming 7 records after 1 ms and completed after 2735 ms.'