**UNIVERSIDAD POLITECNICA SALESIANA**

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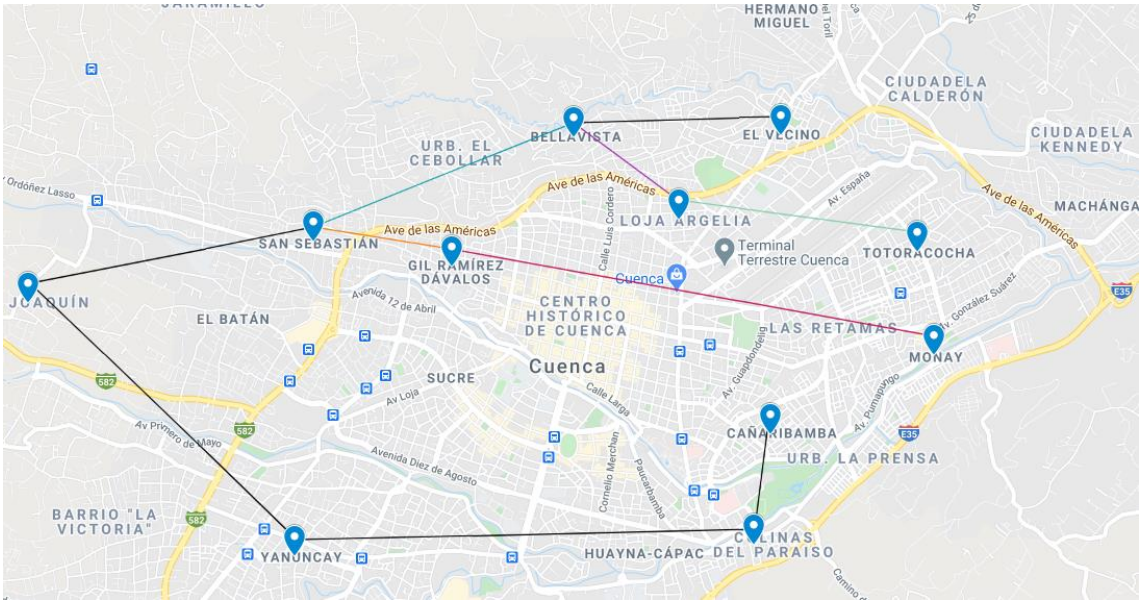
**Carrera: Ingeniería de Sistemas**

**Materia: Inteligencia Artificial**

**Fecha:17/2/2021**

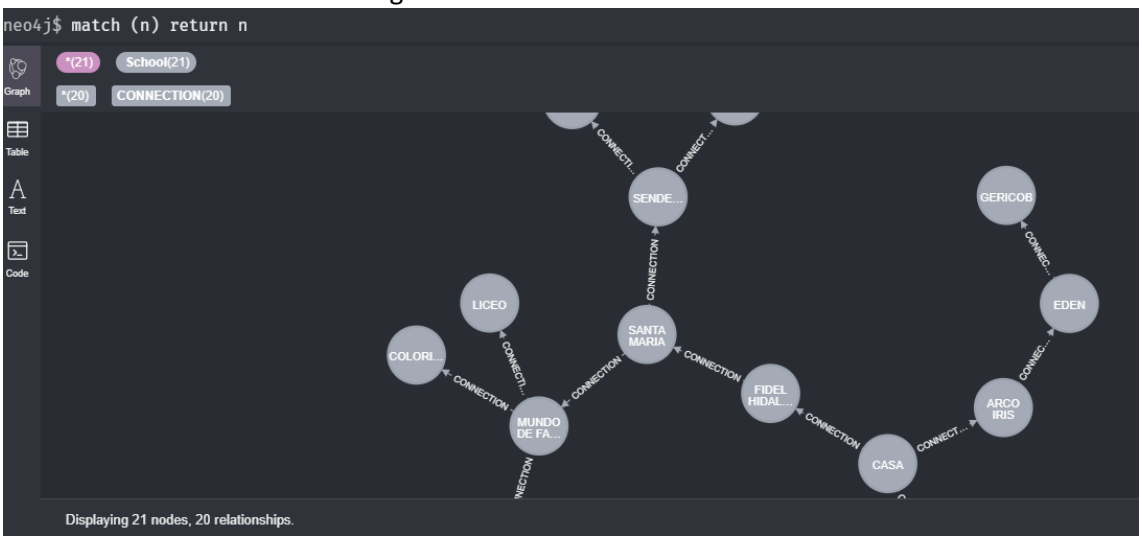
1. Emplear la herramienta Google Maps con las coordenadas antes indicadas.




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.