



UNIVERSIDAD POLITECNICA SALESIANA

SEDE CUENCA

CARRERA: INGENIERIA DE SISTEMAS

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Materia: *Sistemas Expertos*

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Cosine Similarity

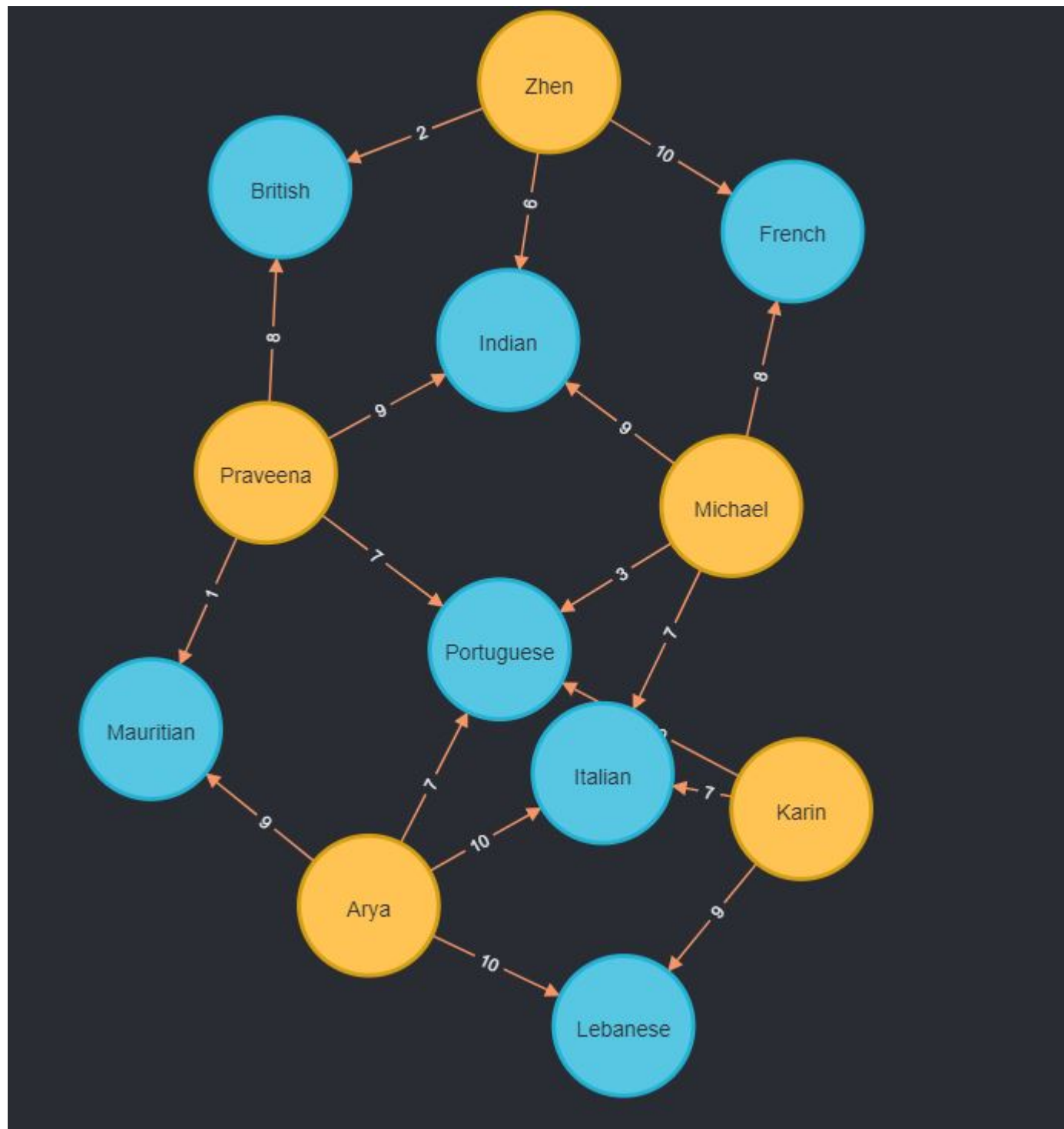
La similitud del coseno es el coseno del ángulo entre dos vectores n - dimensionales en un espacio n -dimensional. Es el producto escalar de los dos vectores dividido por el producto de las longitudes (o magnitudes) de los dos vectores.

1. Creacion de Nodos

In []: ▶

```
1 CREATE (french:Cuisine {name:'French'})
2 CREATE (italian:Cuisine {name:'Italian'})
3 CREATE (indian:Cuisine {name:'Indian'})
4 CREATE (lebanese:Cuisine {name:'Lebanese'})
5 CREATE (portuguese:Cuisine {name:'Portuguese'})
6 CREATE (british:Cuisine {name:'British'})
7 CREATE (mauritian:Cuisine {name:'Mauritian'})
8
9 CREATE (zhen:Person {name: "Zhen"})
10 CREATE (praveena:Person {name: "Praveena"})
11 CREATE (michael:Person {name: "Michael"})
12 CREATE (arya:Person {name: "Arya"})
13 CREATE (karin:Person {name: "Karin"})
14
15 CREATE (praveena)-[:LIKES {score: 9}]->(indian)
16 CREATE (praveena)-[:LIKES {score: 7}]->(portuguese)
17 CREATE (praveena)-[:LIKES {score: 8}]->(british)
18 CREATE (praveena)-[:LIKES {score: 1}]->(mauritian)
19
20 CREATE (zhen)-[:LIKES {score: 10}]->(french)
21 CREATE (zhen)-[:LIKES {score: 6}]->(indian)
22 CREATE (zhen)-[:LIKES {score: 2}]->(british)
23
24 CREATE (michael)-[:LIKES {score: 8}]->(french)
25 CREATE (michael)-[:LIKES {score: 7}]->(italian)
26 CREATE (michael)-[:LIKES {score: 9}]->(indian)
27 CREATE (michael)-[:LIKES {score: 3}]->(portuguese)
28
29 CREATE (arya)-[:LIKES {score: 10}]->(lebanese)
30 CREATE (arya)-[:LIKES {score: 10}]->(italian)
31 CREATE (arya)-[:LIKES {score: 7}]->(portuguese)
32 CREATE (arya)-[:LIKES {score: 9}]->(mauritian)
33
34 CREATE (karin)-[:LIKES {score: 9}]->(lebanese)
35 CREATE (karin)-[:LIKES {score: 7}]->(italian)
36 CREATE (karin)-[:LIKES {score: 10}]->(portuguese)
```

MATCH de los Nodos Creados.



Lo siguiente devolverá la similitud coseno de Michael y Arya:

```
In [ ]: 1 MATCH (p1:Person {name: 'Michael'})-[likes1:LIKES]->(cuisine)
2 MATCH (p2:Person {name: "Arya"})-[likes2:LIKES]->(cuisine)
3 RETURN p1.name AS from,
4         p2.name AS to,
5         gds.alpha.similarity.cosine(collect(likes1.score), collect(likes2.score)) AS similarity
```

"from"	"to"	"similarity"
"Michael"	"Arya"	0.9788908326303921

Lo siguiente devolverá la similitud de Coseno de Michael y las otras personas que tienen una cocina en común:

```
In [ ]: 1 MATCH (p1:Person {name: 'Michael'})-[likes1:LIKES]->(cuisine)
2 MATCH (p2:Person)-[likes2:LIKES]->(cuisine) WHERE p2 <> p1
3 RETURN p1.name AS from,
4         p2.name AS to,
5         gds.alpha.similarity.cosine(collect(likes1.score), collect(likes2.score)) AS similarity
6 ORDER BY similarity DESC
```

"from"	"to"	"similarity"
"Michael"	"Arya"	0.9788908326303921
"Michael"	"Zhen"	0.9542262139256075
"Michael"	"Praveena"	0.9429903335828894
"Michael"	"Karin"	0.8498063272285821

In []: ▶

1