Sistemas Expertos
Tema: Basados casos

Prueba Practica Sistemas Expertos Basados en casos.

Objetivo:

- Consolidar los conocimientos adquiridos en clase de los sistemas expertos basados en casos.

Enunciado:

Se desea generar un sistema de recomendación de películas, por tal motivo se va a utiliza una base de datos orientada a grafos para lograr esto se describe los pasos a seguir:

1) Con estos datos aplicar el algoritmo de KNN y Similitud de Coseno para la recomendación de películas, seguir el siguiente tutorial: https://www.markhneedham.com/blog/2018/09/28/neo4j-graph-algorithms-cosine-game-of-thrones/ o https://vladbatushkov.medium.com/one-month-graph-challenge-flags-5d30aec366a0.
2) Finalmente realizar alguna interfaz para poder acceder a la recomendación e ingreso de datos y resultados de los procesos en python.

Generar el Informe en PDF y subir los scripts al repositorio Git para su evaluación.

Fecha de Entrega : **18/07/2021 - 23:55**

Criterios de Evaluación
- Neo4J Knn: 50%
- Informe y resultados: 20%
- GUI. programación y pruebas: 30%

Nota: Subir el sistema en un cuaderno de Python + scripts + PDF al Git Personal.

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1. Creación de nodos de https://vladbatushkov.medium.com/one-month-graph-challenge-flags-5d30aec366a0

- Creación de los Colores

```
CREATE (red:Color { name: "Red" })
CREATE (white:Color { name: "White" })
CREATE (blue:Color { name: "Blue" })
CREATE (green:Color { name: "Green" })
CREATE (yellow:Color { name: "Yellow" })
CREATE (black:Color { name: "Black" })
CREATE (f1:Flag { name: "Belarus" })
```

- Creacion de las relaciones con los colores para crear las Banderas

```
CREATE (f1:Flag { name: "Belarus" })
CREATE (f1)-[:CONTAINS { weight: 60 }]->(red)
CREATE (f1)-[:CONTAINS { weight: 30 }]->(green)
CREATE (f1)-[:CONTAINS { weight: 10 }]->(white)
CREATE (f2:Flag { name: "Russia" })
CREATE (f2)-[:CONTAINS { weight: 33 }]->(red)
CREATE (f2)-[:CONTAINS { weight: 33 }]->(blue)
CREATE (f2)-[:CONTAINS { weight: 33 }]->(white)
CREATE (f3:Flag { name: "Ukrain" })
CREATE (f3)-[:CONTAINS { weight: 50 }]->(yellow)
CREATE (f3)-[:CONTAINS { weight: 50 }]->(blue)
CREATE (f4:Flag { name: "Finland" })
CREATE (f4)-[:CONTAINS { weight: 80 }]->(white)
CREATE (f4)-[:CONTAINS { weight: 20 }]->(blue)
CREATE (f5:Flag { name: "Sweden" })
CREATE (f5)-[:CONTAINS { weight: 20 }]->(yellow)
CREATE (f5)-[:CONTAINS { weight: 80 }]->(blue)
CREATE (f6:Flag { name: "Norway" })
CREATE (f6)-[:CONTAINS { weight: 70 }]->(red)
CREATE (f6)-[:CONTAINS { weight: 20 }]->(white)
CREATE (f6)-[:CONTAINS { weight: 10 }]->(blue)
CREATE (f7:Flag { name: "Denmark" })
CREATE (f7)-[:CONTAINS { weight: 80 }]->(red)
CREATE (f7)-[:CONTAINS { weight: 20 }]->(white)
CREATE (f8:Flag { name: "Estonia" })
CREATE (f8)-[:CONTAINS { weight: 33 }]->(white)
CREATE (f8)-[:CONTAINS { weight: 33 }]->(blue)
CREATE (f8)-[:CONTAINS { weight: 33 }]->(black)
CREATE (f9:Flag { name: "Latvia" })
CREATE (f9)-[:CONTAINS { weight: 66 }]->(red)
CREATE (f9)-[:CONTAINS { weight: 33 }]->(white)
CREATE (f10:Flag { name: "Lithuania" })
```

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```
CREATE (f10)-[:CONTAINS { weight: 33 }]->(yellow)
CREATE (f10)-[:CONTAINS { weight: 33 }]->(green)
CREATE (f10)-[:CONTAINS { weight: 33 }]->(red)
CREATE (f11:Flag { name: "Poland" })
CREATE (f11)-[:CONTAINS { weight: 50 }]->(red)
CREATE (f11)-[:CONTAINS { weight: 50 }]->(white)
CREATE (f12:Flag { name: "Germany" })
CREATE (f12)-[:CONTAINS { weight: 33 }]->(red)
CREATE (f12)-[:CONTAINS { weight: 33 }]->(black)
CREATE (f12)-[:CONTAINS { weight: 33 }]->(yellow)
CREATE (f13:Flag { name: "Belgium" })
CREATE (f13)-[:CONTAINS { weight: 33 }]->(red)
CREATE (f13)-[:CONTAINS { weight: 33 }]->(black)
CREATE (f13)-[:CONTAINS { weight: 33 }]->(yellow)
CREATE (f14:Flag { name: "Czechia" })
CREATE (f14)-[:CONTAINS { weight: 33 }]->(red)
CREATE (f14)-[:CONTAINS { weight: 33 }]->(white)
CREATE (f14)-[:CONTAINS { weight: 33 }]->(blue)
CREATE (f15:Flag { name: "Hungary" })
CREATE (f15)-[:CONTAINS { weight: 33 }]->(red)
CREATE (f15)-[:CONTAINS { weight: 33 }]->(white)
CREATE (f15)-[:CONTAINS { weight: 33 }]->(green)
CREATE (f16:Flag { name: "Romaina" })
CREATE (f16)-[:CONTAINS { weight: 33 }]->(red)
CREATE (f16)-[:CONTAINS { weight: 33 }]->(yellow)
CREATE (f16)-[:CONTAINS { weight: 33 }]->(blue)
CREATE (f17:Flag { name: "Austria" })
CREATE (f17)-[:CONTAINS { weight: 66 }]->(red)
CREATE (f17)-[:CONTAINS { weight: 33 }]->(white)
CREATE (f18:Flag { name: "Italy" })
CREATE (f18)-[:CONTAINS { weight: 33 }]->(red)
CREATE (f18)-[:CONTAINS { weight: 33 }]->(white)
CREATE (f18)-[:CONTAINS { weight: 33 }]->(green)
CREATE (f19:Flag { name: "Switzerland" })
CREATE (f19)-[:CONTAINS { weight: 90 }]->(red)
CREATE (f19)-[:CONTAINS { weight: 10 }]->(white)
CREATE (f20:Flag { name: "Spain" })
CREATE (f20)-[:CONTAINS { weight: 60 }]->(red)
CREATE (f20)-[:CONTAINS { weight: 40 }]->(yellow)
CREATE (f21:Flag { name: "Portugal" })
CREATE (f21)-[:CONTAINS { weight: 60 }]->(red)
CREATE (f21)-[:CONTAINS { weight: 40 }]->(green)
CREATE (f22:Flag { name: "Netherlands" })
CREATE (f22)-[:CONTAINS { weight: 33 }]->(red)
CREATE (f22)-[:CONTAINS { weight: 33 }]->(white)
CREATE (f22)-[:CONTAINS { weight: 33 }]->(blue)
```

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- Consulta para ver los colores mas usados:

MATCH (:Flag)-[c1:CONTAINS]->(:Color)
WITH sum(c1.weight) as total
MATCH (:Flag)-[c2:CONTAINS]->(cl:Color)
WITH cl.name as colorName, sum(c2.weight) as colorUsed, total
RETURN colorName, colorUsed * 100 / total as percentage
ORDER BY percentage DESC
LIMIT 10

```
1 MATCH (:Flag)-[c1:CONTAINS]→(:Color)
2 WITH sum(c1.weight) as total
3 MATCH (:Flag)-[c2:CONTAINS]→(cl:Color)
4 WITH cl.name as colorName, sum(c2.weight) as colorUsed, total
5 RETURN colorName, colorUsed * 100 / total as percentage
6 ORDER BY percentage DESC
7 LIMIT 10
```

Table | Text | Code

	colorName	percentage
1	"Red"	41
2	"White"	20
3	"Blue"	14
4	"Yellow"	11
5	"Green"	7
6	"Black"	4

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- Consulta para ver la similitude entre banderas

```
MATCH (item:`Flag`), (category:`Color`)
OPTIONAL MATCH (item:`Flag`)-[rel:`CONTAINS`]->(category:`Color`)
WITH {item:id(item), weights: collect(coalesce(rel.`weight`, gds.util.NaN()))} as userData
WITH collect(userData) as data
WITH $config AS config, data
WITH config { .*, data: data} as config

CALL gds.alpha.similarity.cosine.stream(config)

YIELD item1, item2, similarity
RETURN gds.util.asNode(item1) AS from, gds.util.asNode(item2) AS to, similarity
ORDER BY similarity DESC
LIMIT toInteger($limit)
```

From Labels	From Properties	To Labels	To Properties	Similarity
Flag	Belarus	Flag	Germany	1
Flag	Belarus	Flag	Estonia	1
Flag	Russia	Flag	Ukrain	1
Flag	Russia	Flag	Estonia	1
Flag	Russia	Flag	Sweden	1
Flag	Ukrain	Flag	Russia	1
Flag	Ukrain	Flag	Norway	1
Flag	Ukrain	Flag	Finland	1