



به نام خدا  
دانشگاه تهران  
دانشکده مهندسی برق و کامپیوتر



## درس آزمایشگاه پایگاه داده دستورکار سوم

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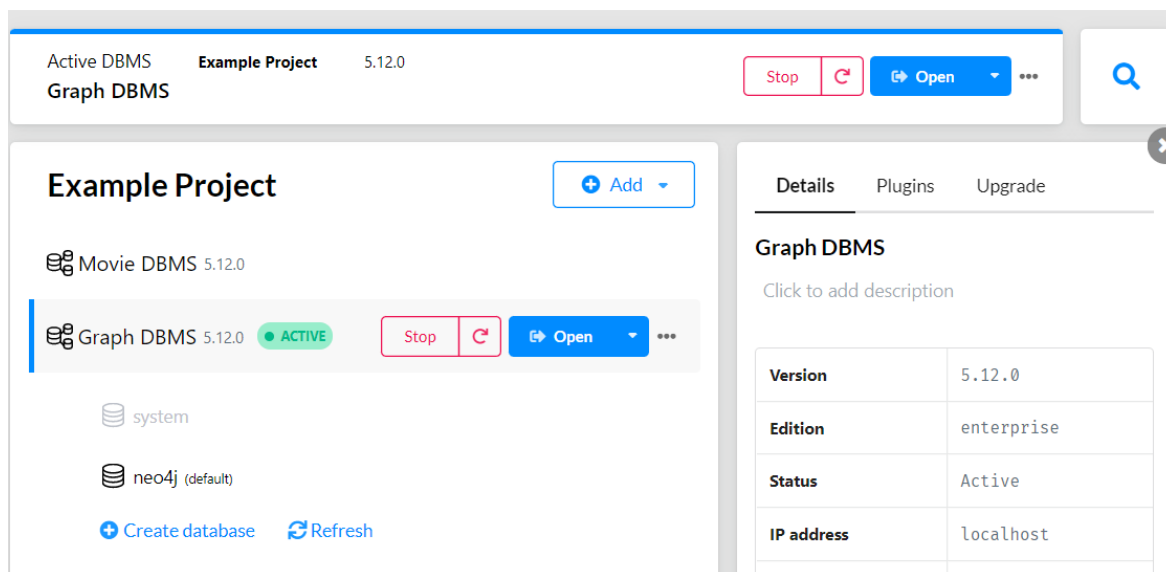
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## پاسخ ۱. مراحل انجام شده در در سایت Quackit

### ۱-۱. Neo4j Installation

ابتدا برنامه را نصب کردم و سپس یک سرور جدید اضافه کردم که در شکل زیر قابل مشاهده است.



### ۱-۲. آشنایی با زبان Cypher

در این قسمت با کوئری‌های زبان در neo4j آشنا می‌شویم که از آنها استفاده می‌شود.

مثلا در مورد زیر تمام گره‌های نوع person که مشخصی اسم Homer Flinstone است را برگردان.

### Example

Here's an example of a Cypher statement:

```
MATCH (p:Person { name:"Homer Flinstone" })
RETURN p
```

یا در مثال زیر دو نود که روی یال آنها KNOWS وجود دارد اضافه می‌شود.

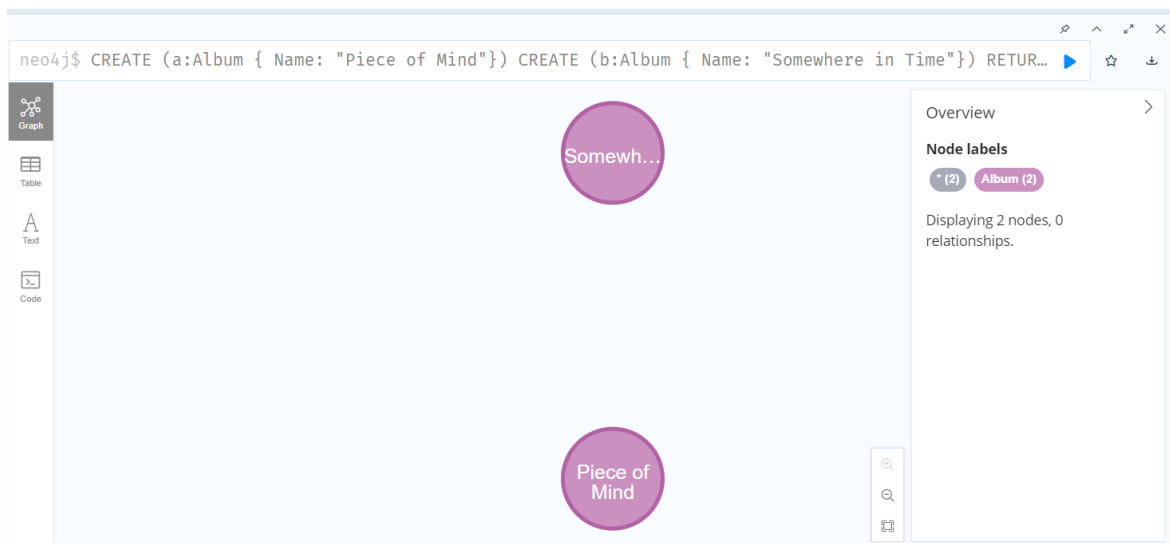
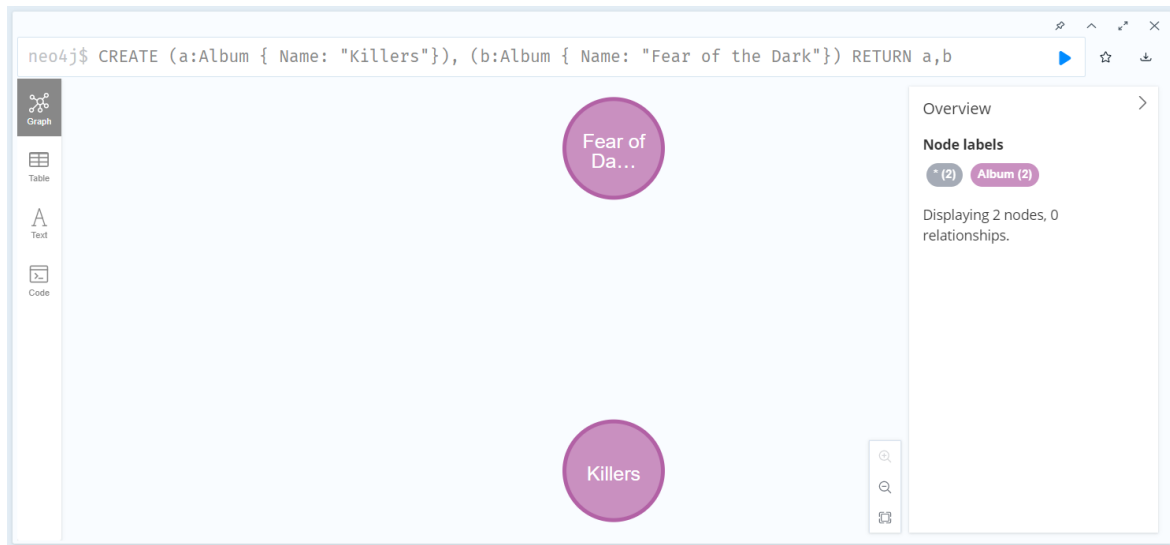
## ASCII-Art Syntax

Cypher uses ASCII-Art to represent patterns. This is a handy thing to remember when first learning the language. If you forget how to write something, just visualise how the graph will look and it should help.

```
(a)-[:KNOWS]->(b)
```

### ۱-۳. ایجاد گره جدید





۴-۱. ایجاد Relationship جدید

neo4j\$

```
neo4j$ MATCH (a:Artist),(b:Album) WHERE a.Name = "Strapping Young Lad" AND b.Name = "Heavy as a Real..."
```

Table

r
<pre>{   "identity": 0,   "start": 0,   "end": 1,   "type": "RELEASED",   "properties": {    },   "elementId": "0",   "startNodeElementId": "0",   "endNodeElementId": "1" }</pre>

Created 1 relationship, started streaming 1 records after 12 ms and completed after 39 ms.

neo4j\$ CREATE (p:Person { Name: "Devin Townsend" })

Table

Added 1 label, created 1 node, set 1 property, completed after 4 ms.

neo4j\$ MATCH (a:Artist),(b:Album),(p:Person) WHERE a.Name = "Strapping Young Lad" AND b.Name = "Heav..."

Graph

Overview

**Node labels**

- (3) Artist (1)
- Album (1)
- Person (1)

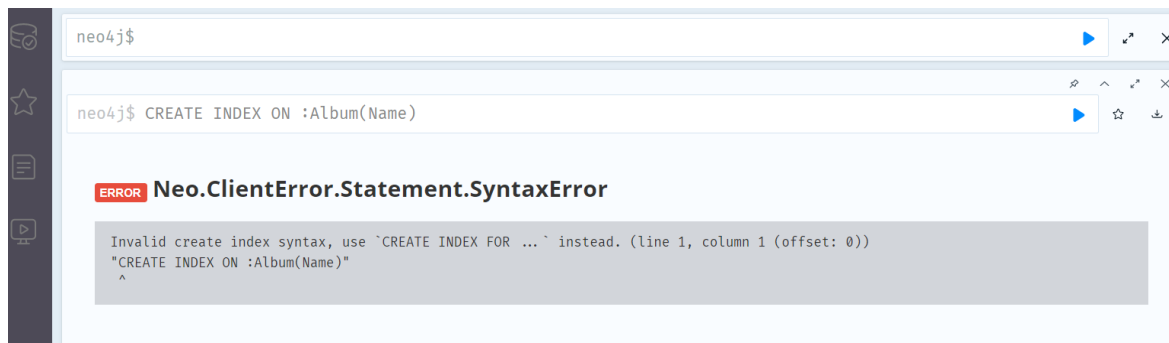
**Relationship types**

- \* (4) RELEASED (1)
- PRODUCED (1)
- PERFORMED\_ON (1)
- PLAYS\_IN (1)

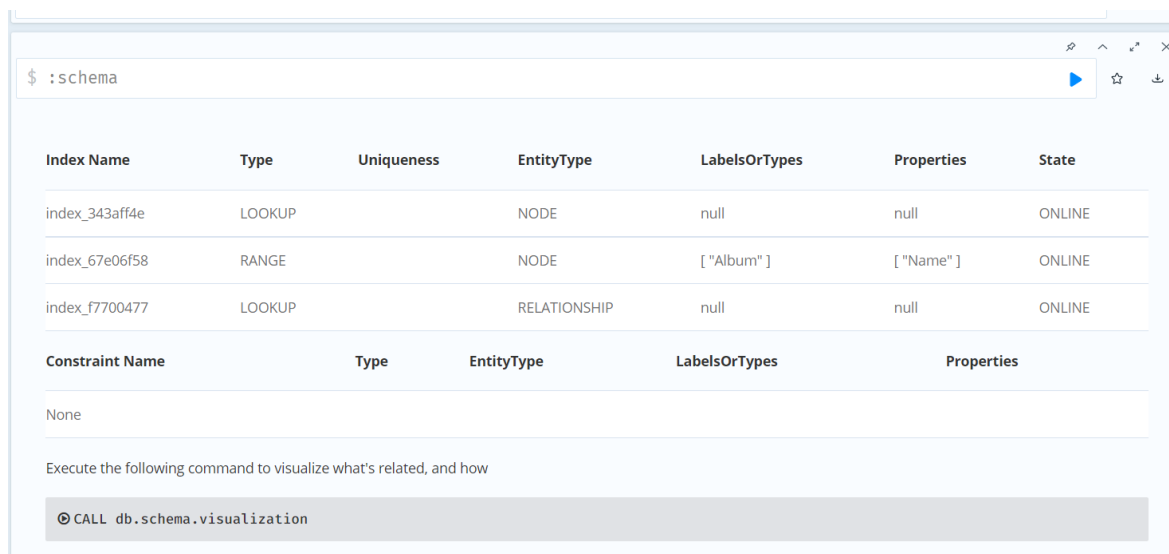
Displaying 3 nodes, 0 relationships.

۵-۱. ایجاد index

با زدن دستور در آموزش به ارور خوردیم.



دستور را تغییر دادم و ایندکس را روی Name قرار دادم و به خروجی زیر رسیدم.





## ۱-۶. ایجاد constraint

برخی از دستورات داخل آموزش دچار خطا شدن که به گونه‌ای آنها را تغییر دادم که ارور ندهند.



\$ :schema

Index Name	Type	Uniqueness	EntityType	LabelsOrTypes	Properties	State
index_343aff4e	LOOKUP		NODE	null	null	ONLINE
index_67e06f58	RANGE		NODE	[ "Album" ]	[ "Name" ]	ONLINE
index_f7700477	LOOKUP		RELATIONSHIP	null	null	ONLINE

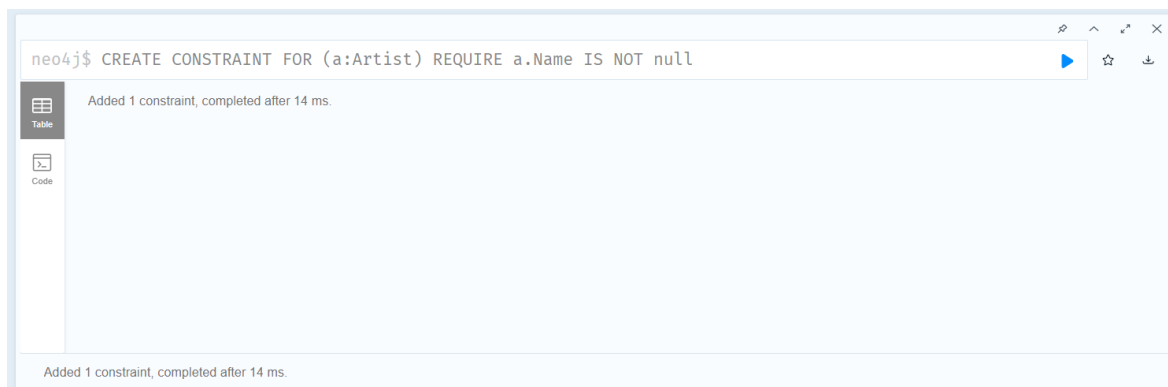
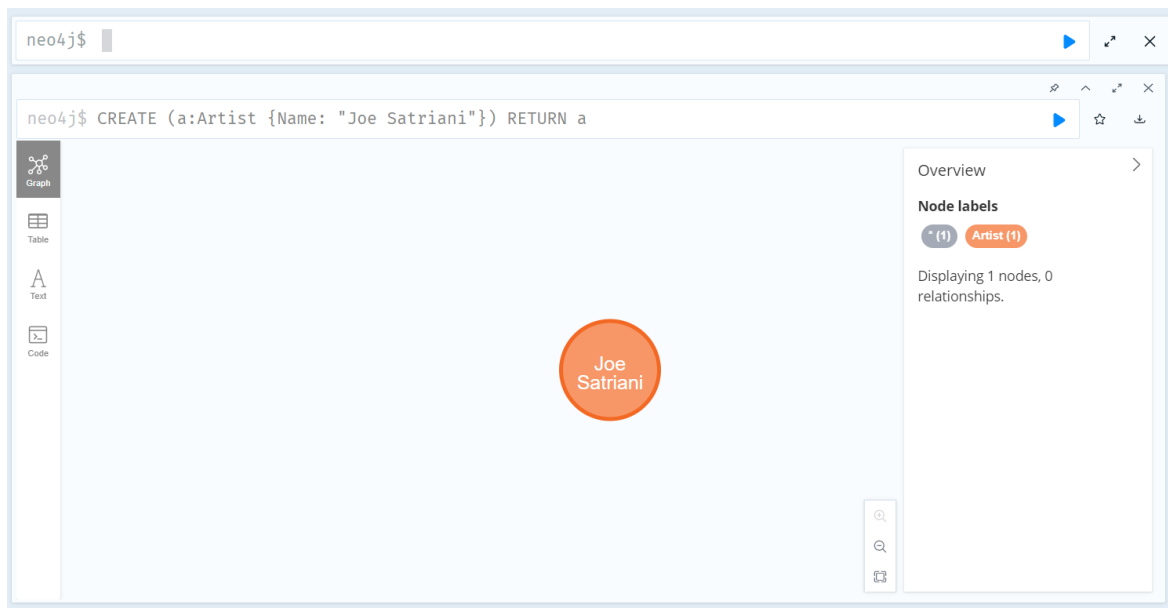
  

Constraint Name	Type	EntityType	LabelsOrTypes	Properties
constraint_1ef3c363	NODE_PROPERTY_EXISTENCE	NODE	[ "Artist" ]	[ "Name" ]

Execute the following command to visualize what's related, and how

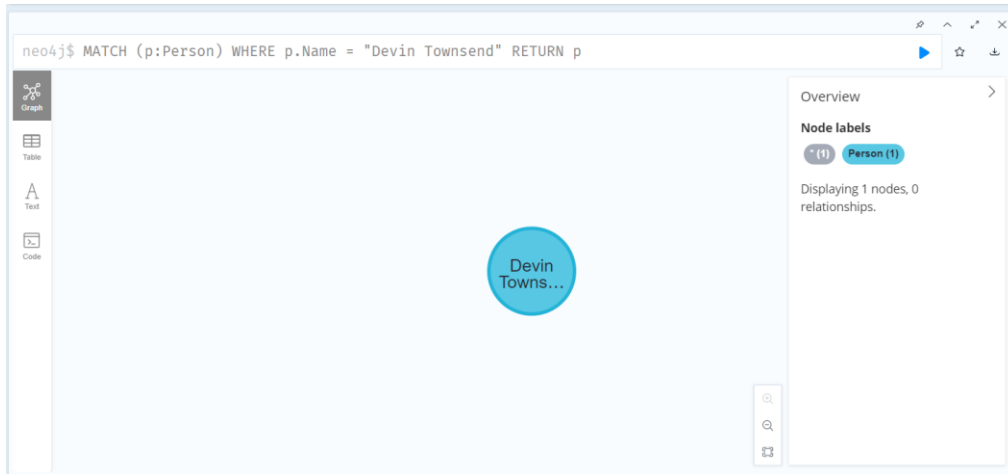
CALL db.schema.visualization





## ۷-۱. دستورات بخش Neo4j - Selecting data with MATCH using Cypher

neo4j\$ MATCH (p:Person) WHERE p.Name = "Devin Townsend" RETURN p



The interface shows a single blue circular node in the center of the graph area. The node is labeled 'Devin Towns...'. On the right, the 'Overview' panel displays 'Node labels' as '\* (1) Person (1)' and states 'Displaying 1 nodes, 0 relationships.' The left sidebar contains icons for Graph, Table, Text, and Code.

neo4j\$ MATCH (p:Person {Name: "Devin Townsend"}) RETURN p

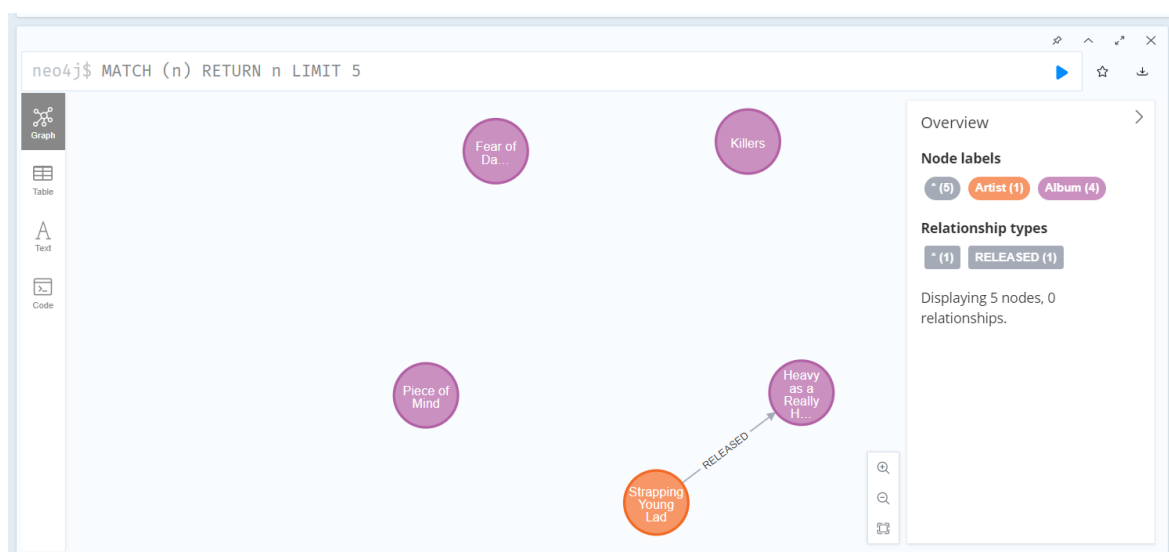
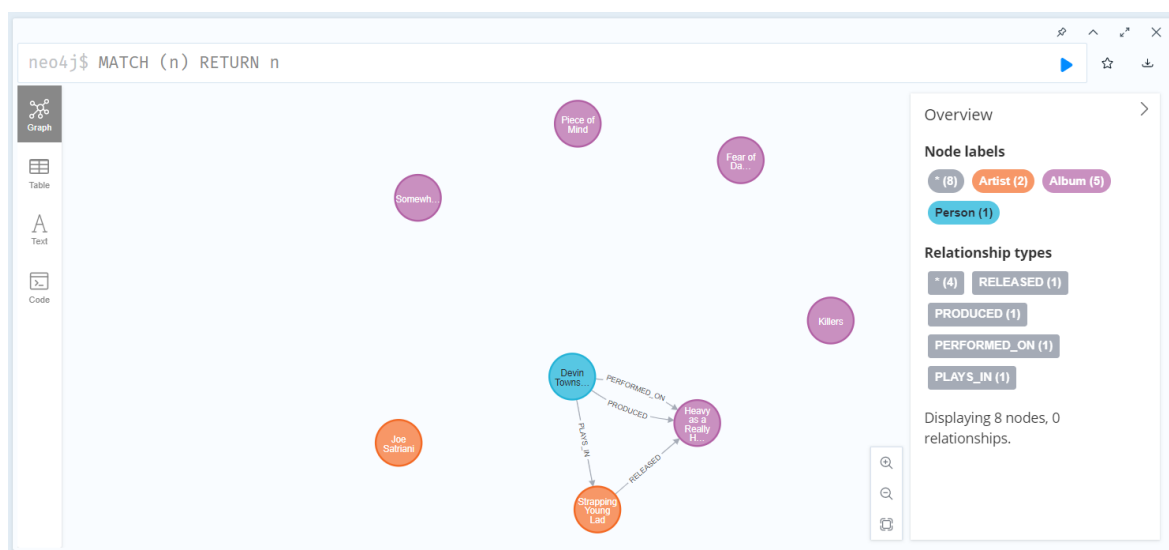


The interface shows a single blue circular node in the center of the graph area. The node is labeled 'Devin Towns...'. A light blue tooltip box at the bottom center contains the text 'Use Ctrl or Shift + scroll to zoom' and 'Don't show again'. On the right, the 'Overview' panel displays 'Node labels' as '\* (1) Person (1)' and states 'Displaying 1 nodes, 0 relationships.' The left sidebar contains icons for Graph, Table, Text, and Code.

neo4j\$ MATCH (a:Artist)-[:RELEASED]->(b:Album) WHERE b.Name = "Heavy as a Really Heavy Thing" RETURN...



The interface shows a single orange circular node in the center of the graph area. The node is labeled 'Strapping Young Lad'. On the right, the 'Overview' panel displays 'Node labels' as '\* (1) Artist (1)' and states 'Displaying 1 nodes, 0 relationships.' The left sidebar contains icons for Graph, Table, Text, and Code.



## ۸-۱. وارد دیتا از فایل CSV

برخی از دستورات داخل آموزش دچار خطا شدن که به گونه‌ای آنها را تغییر دادم که ارور ندهند.

neo4j\$ LOAD CSV FROM 'https://www.quackit.com/neo4j/tutorial/genres.csv' AS line CREATE (:Genre { Ge...

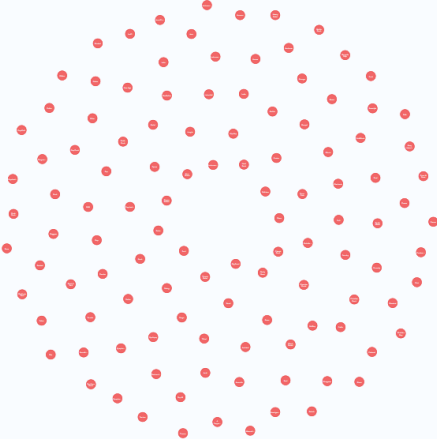
Added 115 labels, created 115 nodes, set 230 properties, completed after 1220 ms.

Table

Code

Added 115 labels, created 115 nodes, set 230 properties, completed after 1220 ms.

neo4j\$ MATCH (n:Genre) RETURN n



Overview

**Node labels**

\*(115) Genre (115)

Displaying 115 nodes, 0 relationships.

Graph

Table

Text

Code

neo4j\$ LOAD CSV WITH HEADERS FROM 'https://www.quackit.com/neo4j/tutorial/tracks.csv' AS line CREATE...

Added 32 labels, created 32 nodes, set 96 properties, completed after 1066 ms.

Table

Code

Added 32 labels, created 32 nodes, set 96 properties, completed after 1066 ms.



## ۹-۱. حذف Index

برخی از دستورات داخل آموزش دچار خطا شدن که به گونه‌ای آنها را تغییر دادم که ارور ندهند.

neo4j\$ SHOW INDEXES

	id	name	state	populationPercent	type	entityType	labelsOrTypes	properties	indexProvider	owningCo
1	5	"constraint_bb37e9f5"	"ONLINE"	100.0	"RANGE"	"NODE"	["Artist"]	["Name"]	"range-1.0"	"constraint"
2	1	"index_343aff4e"	"ONLINE"	100.0	"LOOKUP"	"NODE"	null	null	"token-lookup-1.0"	null
3	3	"index_67e06f58"	"ONLINE"	100.0	"RANGE"	"NODE"	["Album"]	["Name"]	"range-1.0"	null
4	2	"index_f7700477"	"ONLINE"	100.0	"LOOKUP"	"RELATIONSHIP"	null	null	"token-lookup-1.0"	null

Started streaming 4 records after 19 ms and completed after 20 ms.

neo4j\$ DROP INDEX index\_67e06f58

Removed 1 index, completed after 2 ms.

Removed 1 index, completed after 2 ms.

\$ : SCHEMA

Index Name	Type	Uniqueness	EntityType	LabelsOrTypes	Properties	State
constraint_bb37e9f5	RANGE		NODE	["Artist"]	["Name"]	ONLINE
index_343aff4e	LOOKUP		NODE	null	null	ONLINE
index_f7700477	LOOKUP		RELATIONSHIP	null	null	ONLINE

Constraint Name	Type	EntityType	LabelsOrTypes	Properties
constraint_1ef3c363	NODE_PROPERTY_EXISTENCE	NODE	["Artist"]	["Name"]
constraint_bb37e9f5	UNIQUENESS	NODE	["Artist"]	["Name"]

Execute the following command to visualize what's related, and how

CALL db.schema.visualization

## ١٠-١. حذف Constraint

برخی از دستورات داخل آموزش دچار خطا شدن که به گونه‌ای آنها را تغییر دادم که ارور ندهند.

neo4j\$ SHOW CONSTRAINTS

	id	name	type	entityType	labelsOrTypes	properties	ownedIndex	propertyType
1	4	"constraint_1ef3c363"	"NODE_PROPERTY_EXISTENCE"	"NODE"	["Artist"]	["Name"]	null	null
2	6	"constraint_bb37e9f5"	"UNIQUENESS"	"NODE"	["Artist"]	["Name"]	"constraint_bb37e9f5"	null

Started streaming 2 records after 1 ms and completed after 1 ms.

neo4j\$ DROP CONSTRAINT constraint\_bb37e9f5

Removed 1 constraint, completed after 6 ms.

Removed 1 constraint, completed after 6 ms.

\$ : SCHEMA

Index Name	Type	Uniqueness	EntityType	LabelsOrTypes	Properties	State
index_343aff4e	LOOKUP		NODE	null	null	ONLINE
index_f7700477	LOOKUP		RELATIONSHIP	null	null	ONLINE

Constraint Name	Type	EntityType	LabelsOrTypes	Properties
constraint_1ef3c363	NODE_PROPERTY_EXISTENCE	NODE	["Artist"]	["Name"]

Execute the following command to visualize what's related, and how

CALL db.schema.visualization

## ۱-۱۱. حذف گره

```
neo4j$ MATCH (a:Album {Name: "Killers"}) DELETE a
```

Deleted 1 node, completed after 3 ms.

```
neo4j$ MATCH (a:Artist {Name: "Iron Maiden"}), (b:Album {Name: "Powerslave"}) DELETE a, b
```

(no changes, no records)

Completed after 14 ms.

```
neo4j$ MATCH (n) DELETE n
```

**ERROR** Neo.ClientError.Schema.ConstraintValidationFailed

Cannot delete node<0>, because it still has relationships. To delete this node, you must first delete its relationships.



## ۱۲-۱. حذف رابطه

برخی از دستورات داخل آموزش دچار خطا شدن که به گونه‌ای آنها را تغییر دادم که ارور ندهند.

```
neo4j$ MATCH ()-[r:RELEASED]-() DELETE r
```

Deleted 1 relationship, completed after 24 ms.

```
neo4j$ MATCH (:Artist)-[r:RELEASED]-(:Album) DELETE r
```

(no changes, no records)

Completed after 5 ms.

```
neo4j$ MATCH (:Artist {Name: "Strapping Young Lad"})-[r:RELEASED]-(:Album {Name: "Heavy as a Really ...
```

(no changes, no records)

Completed after 7 ms.

neo4j\$ MATCH (a:Artist {Name: "Strapping Young Lad"}) DELETE a

ERROR

Neo.ClientError.Schema.ConstraintValidationFailed

Cannot delete node<0>, because it still has relationships. To delete this node, you must first delete its relationships.

neo4j\$ MATCH (a:Artist {Name: "Strapping Young Lad"}) DETACH DELETE a

Table

Deleted 1 node, deleted 1 relationship, completed after 2 ms.

Code

Deleted 1 node, deleted 1 relationship, completed after 2 ms.

neo4j\$ MATCH (n) DETACH DELETE n

Table

Deleted 249 nodes, deleted 2 relationships, completed after 3 ms.

Code

Deleted 249 nodes, deleted 2 relationships, completed after 3 ms.