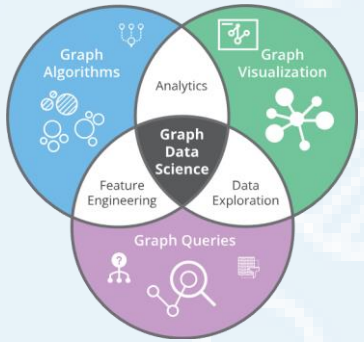

Habib University
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CS343 Graph Data Science

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Constraints and Indexes in Cypher

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Slides are intended to be filled during the lectures. Certain details are intentionally omitted for in-class discussions. These slides are not meant to be used as reading material.

Constraints

- **Definition**: Constraints are rules enforced on the graph data to ensure data integrity.
- **Purpose**: Ensure that certain conditions are always true in the graph.
- **Types**:
  - **Uniqueness**: Ensures uniqueness of property values for nodes or relationship.
  - **Existence**: Ensures properties exist for node or relationships.
  - **Existence and Uniqueness (Node Key)** : Ensures both uniqueness and existence.
- **Use Constraints When**:
  - Enforcing data integrity.

Indexes

- **Definition**: Indexes are structures used to speed up lookup operations on properties.
- **Purpose**: Improve query performance by enabling faster data retrieval.
- **Types**:
  - Range
  - Lookup
  - Text
  - Full Text
- **Use Indexes When**:
  - Frequently querying on specific properties.
  - Needing to improve query performance.

Syntax

- Unique constraints

```
CREATE CONSTRAINT constraint_name IF NOT EXISTS
FOR (x:Label)
REQUIRE x.proprety IS UNIQUE
```

Syntax

- Existence

```
CREATE CONSTRAINT constraint_name IF NOT EXISTS
FOR (x:Label)
REQUIRE x.proprety IS NOT NULL
```

```
CREATE CONSTRAINT constraint_name IF NOT EXISTS
FOR ()-[x:RELATIONSHIP]-()
REQUIRE x.proprety IS NOT NULL
```

Syntax

- Node Key

```
CREATE CONSTRAINT constraint_name IF NOT EXISTS
FOR (x:Label)
REQUIRE x.proprety IS NODE KEY
```

Syntax

- Range / Lookup

  CREATE INDEX <index_name> IF NOT EXISTS

  FOR (x:<node_label>)

  ON x.<property_key>

- Text

  CREATE TEXT INDEX <index_name> IF NOT EXISTS

  FOR (x:<node_label>)

  ON x.<property_key>

Manage Constraints/Indexes

- SHOW CONSTRAINTS / INDEXES
- DROP CONSTRAINT / INDEX