Results Doc:

**1.1. Node and Relationship Counts**

* **Purpose**: Helps you understand the scale of your graph.

// Count nodes

MATCH (n) RETURN COUNT(n) AS node\_count;

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│node\_count│

╞══════════╡

│60

relationship\_count│

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│174 │

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**1.2. Degree Distribution**

* **Purpose**: The degree of a node (number of connections) reveals important nodes in the graph.
* **How to Perform**:

cypher

Copy code

// Calculate degree for each node

MATCH (n)

RETURN n.id AS node\_id, COUNT { (n)--() } AS degree

node\_id │degree│

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│"Agent\_0" │8 │

├───────────────┼──────┤

│"Agent\_1" │58 │

├───────────────┼──────┤

│"Action\_1" │6 │

├───────────────┼──────┤

│"Action\_2" │4 │

├───────────────┼──────┤

│"Action\_3" │6 │

├───────────────┼──────┤

│"Action\_4" │6 │

├───────────────┼──────┤

│"Action\_5" │2 │

├───────────────┼──────┤

│"Object\_1" │13 │

├───────────────┼──────┤

│"Dialogue\_1" │7 │

├───────────────┼──────┤

│"Subgoal\_1" │6 │

├───────────────┼──────┤

│"Position\_1" │4 │

├───────────────┼──────┤

│"Position\_2" │4 │

├───────────────┼──────┤

│"Position\_3" │4 │

├───────────────┼──────┤

│"Position\_4" │4 │

├───────────────┼──────┤

│"Position\_5" │4 │

├───────────────┼──────┤

│"Position\_6" │4 │

├───────────────┼──────┤

│"Position\_7" │4 │

├───────────────┼──────┤

│"Position\_8" │4 │

├───────────────┼──────┤

│"Position\_9" │4 │

├───────────────┼──────┤

│"Interaction\_1"│12 │

├───────────────┼──────┤

│"ImageFrame\_1" │4 │

├───────────────┼──────┤

│"Agent\_0" │8 │

├───────────────┼──────┤

│"Agent\_1" │58 │

├───────────────┼──────┤

│"Action\_1" │6 │

├───────────────┼──────┤

│"Action\_2" │4 │

├───────────────┼──────┤

│"Action\_3" │6 │

├───────────────┼──────┤

│"Action\_4" │6 │

├───────────────┼──────┤

│"Object\_1" │13 │

├───────────────┼──────┤

│"Object\_2" │2 │

├───────────────┼──────┤

│"Object\_3" │0 │

├───────────────┼──────┤

│"Object\_4" │1 │

├───────────────┼──────┤

│"Object\_5" │0 │

├───────────────┼──────┤

│"Object\_6" │0 │

├───────────────┼──────┤

│"Object\_7" │0 │

├───────────────┼──────┤

│"Object\_8" │0 │

├───────────────┼──────┤

│"Object\_9" │1 │

├───────────────┼──────┤

│"Object\_10" │0 │

├───────────────┼──────┤

│"Object\_11" │0 │

├───────────────┼──────┤

│"Object\_12" │0 │

├───────────────┼──────┤

│"Object\_13" │0 │

├───────────────┼──────┤

│"Object\_14" │0 │

├───────────────┼──────┤

│"Object\_15" │0 │

├───────────────┼──────┤

│"Position\_1" │4 │

├───────────────┼──────┤

│"Position\_2" │4 │

├───────────────┼──────┤

│"Position\_3" │4 │

├───────────────┼──────┤

│"Position\_4" │4 │

├───────────────┼──────┤

│"Position\_5" │4 │

├───────────────┼──────┤

│"Position\_6" │4 │

├───────────────┼──────┤

│"Position\_7" │4 │

├───────────────┼──────┤

│"Position\_8" │4 │

├───────────────┼──────┤

│"Position\_9" │4 │

├───────────────┼──────┤

│"Position\_10" │0 │

├───────────────┼──────┤

│"Position\_11" │2 │

├───────────────┼──────┤

│"Dialogue\_1" │7 │

├───────────────┼──────┤

│"Subgoal\_1" │6 │

├───────────────┼──────┤

│"Subgoal\_2" │4 │

├───────────────┼──────┤

│"Subgoal\_3" │2 │

├───────────────┼──────┤

│"Subgoal\_4" │2 │

├───────────────┼──────┤

│"Interaction\_1"│12 │

├───────────────┼──────┤

│"ImageFrame\_1" │4 │

└───────────────┴──────┘

Shortest apth

MATCH (start {id: "Agent\_0"}), (end {id: "Object\_1"}),

p = shortestPath((start)-[\*]-(end))

RETURN p;

* p │
* ╞══════════════════════════════════════════════════════════════════════╡
* │(:Node {agent\_type: "Commander",id: "Agent\_0",type: "Agent"})-[:RELATI│
* │ONSHIP\_TYPE {relation: "Performs"}]->(:Node {action\_name: "Turn Left",│
* │id: "Action\_3",type: "Action"})-[:RELATIONSHIP\_TYPE {relation: "Involv│
* │es\_Object"}]->(:Node {object\_name: "Mug",id: "Object\_1",type: "Object"│
* │}) │
* ├──────────────────────────────────────────────────────────────────────┤
* │(:Node {agent\_type: "Commander",id: "Agent\_0",type: "Agent"})-[:RELATI│
* │ONSHIP\_TYPE {relation: "Performs"}]->(:Node {action\_name: "Turn Left",│
* │id: "Action\_3",type: "Action"})-[:RELATIONSHIP\_TYPE {relation: "Involv│
* │es\_Object"}]->(:Node {object\_name: "Mug",id: "Object\_1",type: "Object"│
* │}) │
* ├──────────────────────────────────────────────────────────────────────┤
* │(:Node {agent\_type: "Commander",id: "Agent\_0",type: "Agent"})-[:RELATI│
* │ONSHIP\_TYPE {relation: "Performs"}]->(:Node {action\_name: "Turn Left",│
* │id: "Action\_3",type: "Action"})-[:RELATIONSHIP\_TYPE {relation: "Involv│
* │es\_Object"}]->(:Node {object\_name: "Mug",id: "Object\_1",type: "Object"│
* │}) │
* ├──────────────────────────────────────────────────────────────────────┤
* │(:Node {agent\_type: "Commander",id: "Agent\_0",type: "Agent"})-[:RELATI│
* │ONSHIP\_TYPE {relation: "Performs"}]->(:Node {action\_name: "Turn Left",│
* │id: "Action\_3",type: "Action"})-[:RELATIONSHIP\_TYPE {relation: "Involv│
* │es\_Object"}]->(:Node {object\_name: "Mug",id: "Object\_1",type: "Object"│
* │}) │
* └──────────────────────────────────────────────────────────────────────┘

MATCH (a), (b)

WHERE id(a) <> id(b)

MATCH p = shortestPath((a)-[\*]-(b))

RETURN avg(length(p)) AS avg\_path\_length;

│avg\_path\_length │

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│2.1933534743202423│

MATCH (n)

WITH count(n) AS node\_count

MATCH ()-[r]->()

WITH node\_count, count(r) AS relationship\_count

RETURN CASE

WHEN node\_count < 2 THEN 0

ELSE toFloat(relationship\_count) / (node\_count \* (node\_count - 1))

END AS density;

density │

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│0.04915254237288136│