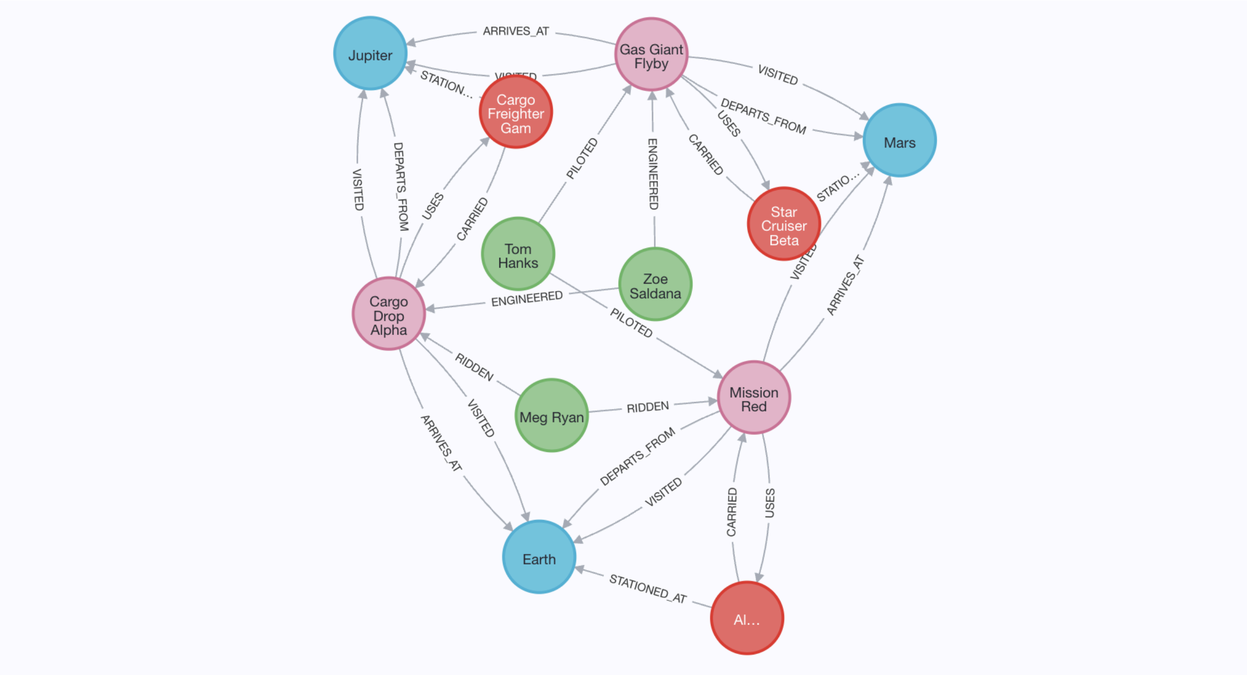
Group 1 (Space)

Graph data model

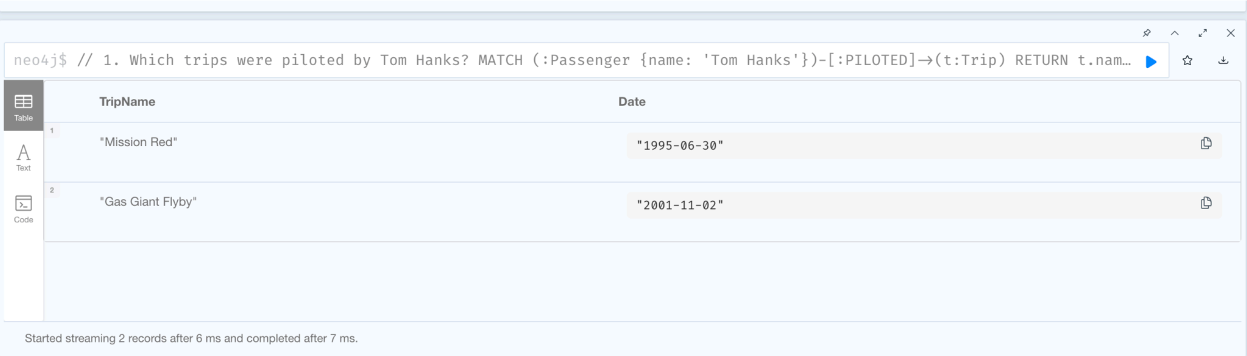


10 questions & Cypher codes & screen shots

// 1. Which trips were piloted by Tom Hanks?

MATCH (:Passenger {name: 'Tom Hanks'})-[:PILOTED]->(t:Trip)

RETURN t.name AS TripName, t.date AS Date;



```
neo4j$ // 1. Which trips were piloted by Tom Hanks? MATCH (:Passenger {name: 'Tom Hanks'})-[:PILOTED]→(t:Trip) RETURN t.nam…
```

	TripName	Date
1	"Mission Red"	"1995-06-30"
2	"Gas Giant Flyby"	"2001-11-02"

Started streaming 2 records after 6 ms and completed after 7 ms.

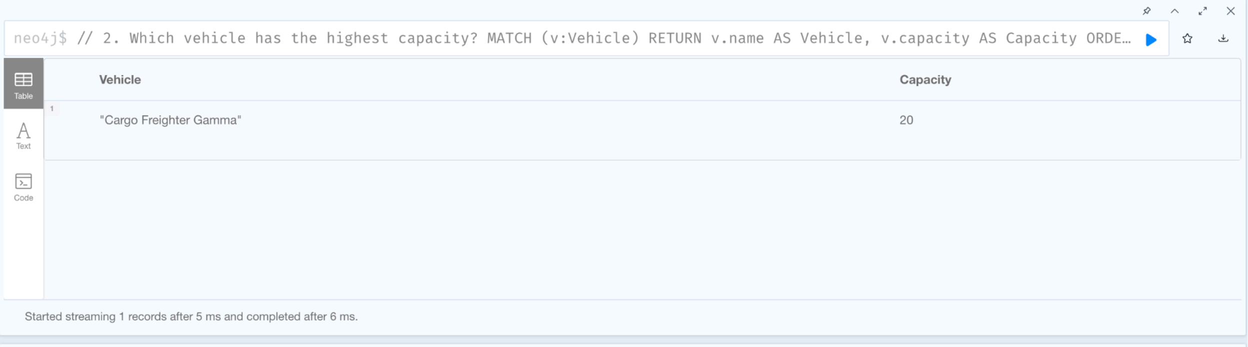
// 2. Which vehicle has the highest capacity?

MATCH (v:Vehicle)

RETURN v.name AS Vehicle, v.capacity AS Capacity

```
ORDER BY v.capacity DESC

LIMIT 1;
```



```
neo4j$ // 2. Which vehicle has the highest capacity? MATCH (v:Vehicle) RETURN v.name AS Vehicle, v.capacity AS Capacity ORDE…
```

	Vehicle	Capacity
1	"Cargo Freighter Gamma"	20

Started streaming 1 records after 5 ms and completed after 6 ms.

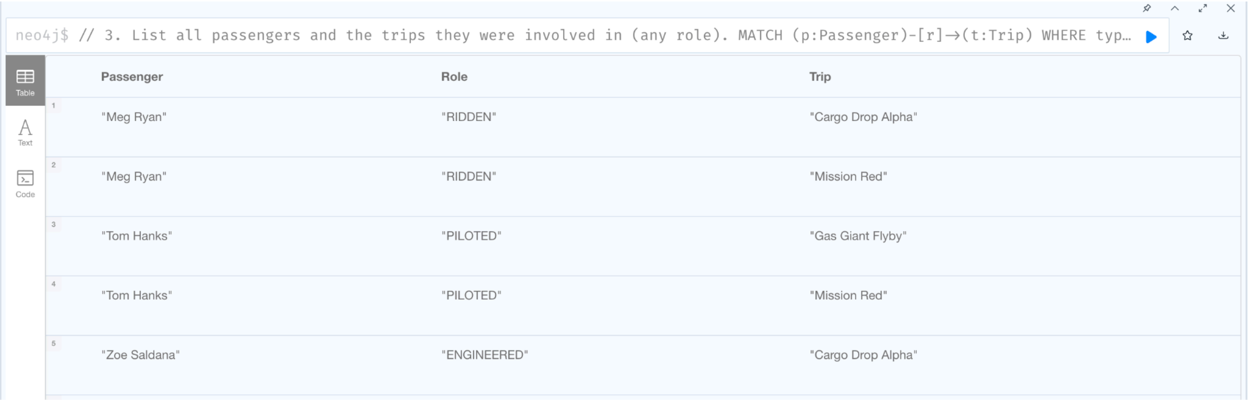
```
// 3. List all passengers and the trips they were involved in (any role).

MATCH (p:Passenger)-[r]->(t:Trip)

WHERE type(r) IN ['RIDDEN', 'PILOTED', 'ENGINEERED']

RETURN p.name AS Passenger, type(r) AS Role, t.name AS Trip

ORDER BY p.name, t.name;
```



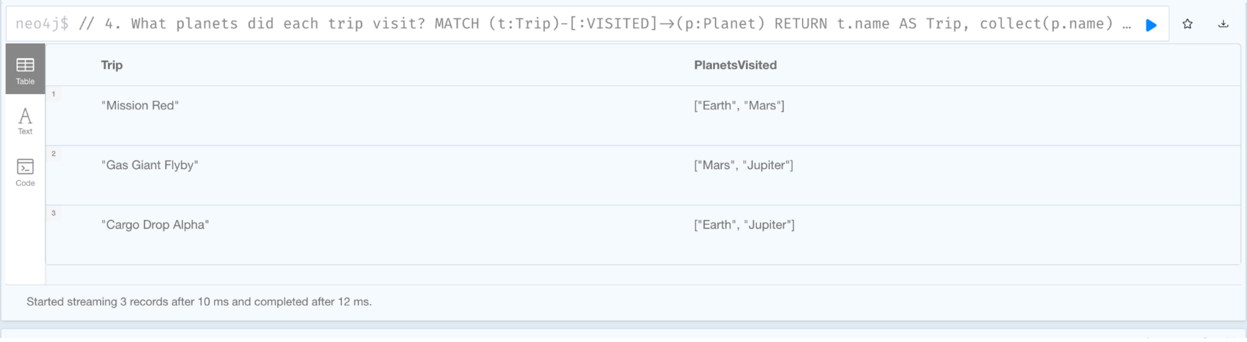
```
neo4j$ // 3. List all passengers and the trips they were involved in (any role). MATCH (p:Passenger)-[r]→(t:Trip) WHERE typ…
```

	Passenger	Role	Trip
1	"Meg Ryan"	"RIDDEN"	"Cargo Drop Alpha"
2	"Meg Ryan"	"RIDDEN"	"Mission Red"
3	"Tom Hanks"	"PILOTED"	"Gas Giant Flyby"
4	"Tom Hanks"	"PILOTED"	"Mission Red"
5	"Zoe Saldana"	"ENGINEERED"	"Cargo Drop Alpha"

```
// 4. What planets did each trip visit?

MATCH (t:Trip)-[:VISITED]->(p:Planet)

RETURN t.name AS Trip, collect(p.name) AS PlanetsVisited;
```



```
neo4j$ // 4. What planets did each trip visit? MATCH (t:Trip)-[:VISITED]→(p:Planet) RETURN t.name AS Trip, collect(p.name) …
```

Trip	PlanetsVisited
"Mission Red"	["Earth", "Mars"]
"Gas Giant Flyby"	["Mars", "Jupiter"]
"Cargo Drop Alpha"	["Earth", "Jupiter"]

Started streaming 3 records after 10 ms and completed after 12 ms.

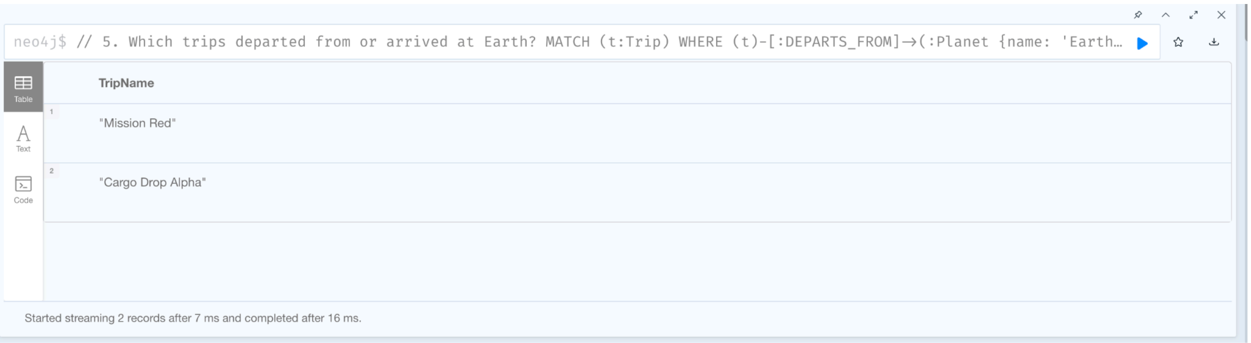
// 5. Which trips departed from or arrived at Earth?

```
MATCH (t:Trip)

WHERE (t)-[:DEPARTS_FROM]->(:Planet {name: 'Earth'})

   OR (t)-[:ARRIVES_AT]->(:Planet {name: 'Earth'})

RETURN t.name AS TripName;
```



```
neo4j$ // 5. Which trips departed from or arrived at Earth? MATCH (t:Trip) WHERE (t)-[:DEPARTS_FROM]→(:Planet {name: 'Earth…
```

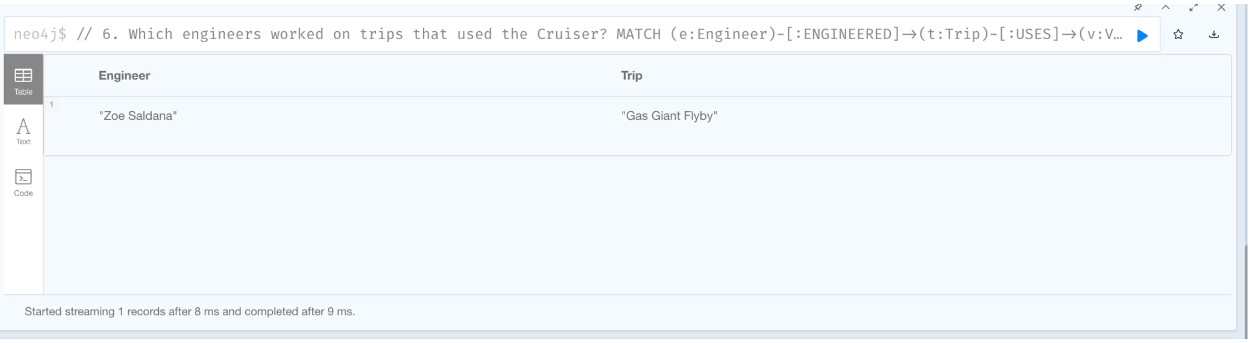
TripName
"Mission Red"
"Cargo Drop Alpha"

Started streaming 2 records after 7 ms and completed after 16 ms.

// 6. Which engineers worked on trips that used the Cruiser?

```
MATCH (e:Engineer)-[:ENGINEERED]->(t:Trip)-[:USES]->(v:Vehicle {type: 'Cruiser'})

RETURN e.name AS Engineer, t.name AS Trip;
```



```
neo4j$ // 6. Which engineers worked on trips that used the Cruiser? MATCH (e:Engineer)-[:ENGINEERED]→(t:Trip)-[:USES]→(v:V…
```

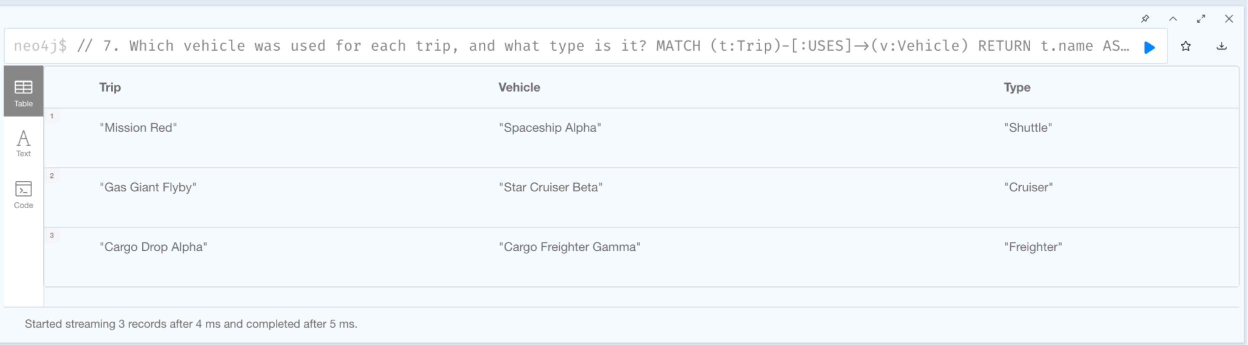
Engineer	Trip
"Zoe Saldana"	"Gas Giant Flyby"

Started streaming 1 records after 8 ms and completed after 9 ms.

// 7. Which vehicle was used for each trip, and what type is it?

```
MATCH (t:Trip)-[:USES]->(v:Vehicle)

RETURN t.name AS Trip, v.name AS Vehicle, v.type AS Type;
```



```
neo4j$ // 7. Which vehicle was used for each trip, and what type is it? MATCH (t:Trip)-[:USES]→(v:Vehicle) RETURN t.name AS…
```

	Trip	Vehicle	Type
1	"Mission Red"	"Spaceship Alpha"	"Shuttle"
2	"Gas Giant Flyby"	"Star Cruiser Beta"	"Cruiser"
3	"Cargo Drop Alpha"	"Cargo Freighter Gamma"	"Freighter"

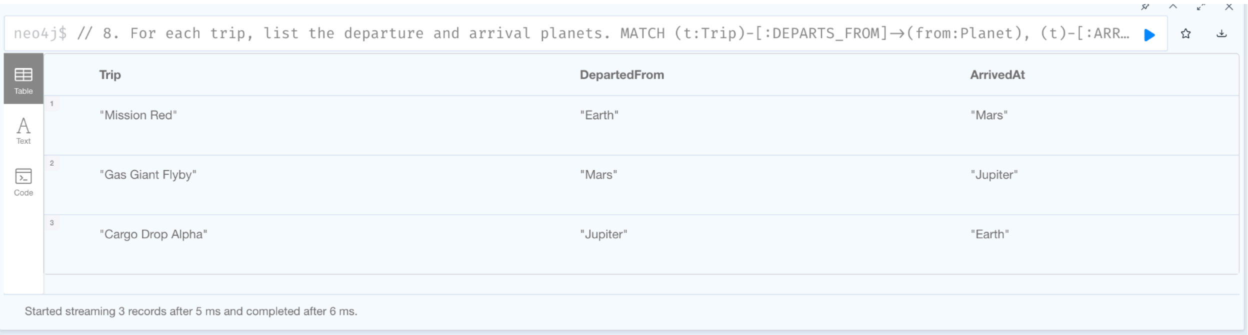
Started streaming 3 records after 4 ms and completed after 5 ms.

```
// 8. For each trip, list the departure and arrival planets.

MATCH (t:Trip)-[:DEPARTS_FROM]->(from:Planet),

      (t)-[:ARRIVES_AT]->(to:Planet)

RETURN t.name AS Trip, from.name AS DepartedFrom, to.name AS ArrivedAt;
```



```
neo4j$ // 8. For each trip, list the departure and arrival planets. MATCH (t:Trip)-[:DEPARTS_FROM]→(from:Planet), (t)-[:ARR…
```

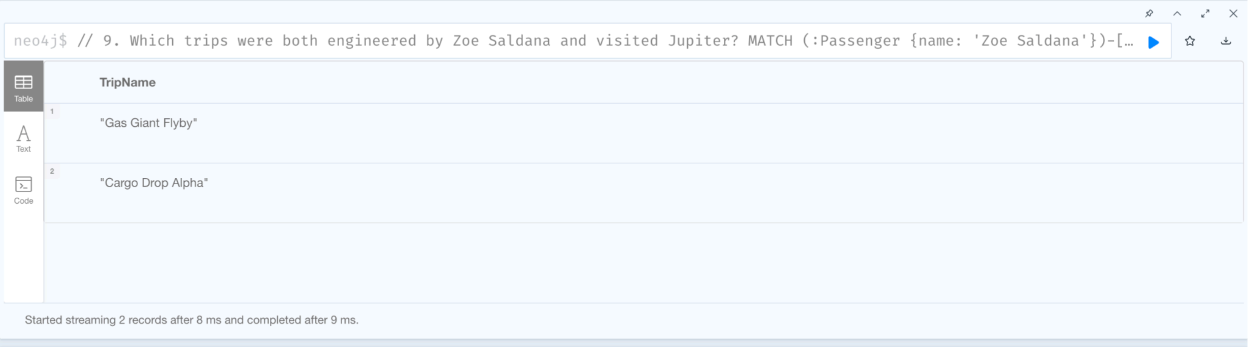
	Trip	DepartedFrom	ArrivedAt
1	"Mission Red"	"Earth"	"Mars"
2	"Gas Giant Flyby"	"Mars"	"Jupiter"
3	"Cargo Drop Alpha"	"Jupiter"	"Earth"

Started streaming 3 records after 5 ms and completed after 6 ms.

```
// 9. Which trips were both engineered by Zoe Saldana and visited Jupiter?

MATCH (:Passenger {name: 'Zoe Saldana'})-[:ENGINEERED]->(t:Trip)-[:VISITED]->(p:Planet {name: 'Jupiter'})

RETURN t.name AS TripName;
```



```
neo4j$ // 9. Which trips were both engineered by Zoe Saldana and visited Jupiter? MATCH (:Passenger {name: 'Zoe Saldana'})-[…
```

	TripName
1	"Gas Giant Flyby"
2	"Cargo Drop Alpha"

Started streaming 2 records after 8 ms and completed after 9 ms.

```
// 10. Which passengers were involved in more than one trip?
```

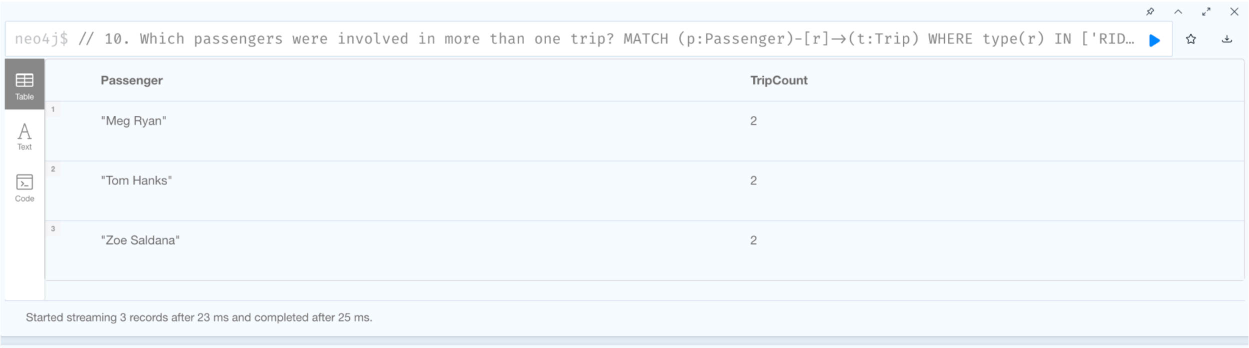
```
MATCH (p:Passenger)-[r]->(t:Trip)

WHERE type(r) IN ['RIDDEN', 'PILOTED', 'ENGINEERED']

WITH p, count(DISTINCT t) AS TripCount

WHERE TripCount > 1

RETURN p.name AS Passenger, TripCount;
```



```
neo4j$ // 10. Which passengers were involved in more than one trip? MATCH (p:Passenger)-[r]→(t:Trip) WHERE type(r) IN ['RID…
```

	Passenger	TripCount
1	"Meg Ryan"	2
2	"Tom Hanks"	2
3	"Zoe Saldana"	2

Started streaming 3 records after 23 ms and completed after 25 ms.

Data:

```
// === Planets ===
CREATE (:Planet {name: 'Earth', solar_id: 0});
CREATE (:Planet {name: 'Mars', solar_id: 1});
CREATE (:Planet {name: 'Jupiter', solar_id: 2});

// === Vehicles (3 Types) ===
CREATE (:Vehicle {name: 'Spaceship Alpha', capacity: 10, type: 'Shuttle'});
CREATE (:Vehicle {name: 'Star Cruiser Beta', capacity: 5, type: 'Cruiser'});
CREATE (:Vehicle {name: 'Cargo Freighter Gamma', capacity: 20, type: 'Freighter'});

// === People ===
CREATE (:Passenger:Astronaut {name: 'Meg Ryan', role: 'astronaut', born:
date('1961-11-19')});
CREATE (:Passenger:Pilot  {name: 'Tom Hanks', role: 'pilot', born: date('1956-07-09')});
CREATE (:Passenger:Engineer  {name: 'Zoe Saldana', role: 'engineer', born:
date('1978-06-19')});

// === Trips ===
CREATE (:Trip {name: 'Mission Red', trip_ID: 1, date: date('1995-06-30')});
CREATE (:Trip {name: 'Gas Giant Flyby', trip_ID: 2, date: date('2001-11-02')});
CREATE (:Trip {name: 'Cargo Drop Alpha', trip_ID: 3, date: date('2025-05-10')});

// === Trip1 Connections (Earth → Mars with Shuttle) ===
MATCH
(Trip1:Trip {name: 'Mission Red'}),
(Earth:Planet {name: 'Earth'}),
(Mars:Planet {name: 'Mars'}),
(Vehicle1:Vehicle {name: 'Spaceship Alpha'}),
(TomH:Passenger {name: 'Tom Hanks'}),
(MegR:Passenger {name: 'Meg Ryan'})
CREATE
(Trip1)-[:DEPARTS_FROM]->(Earth),
(Trip1)-[:ARRIVES_AT]->(Mars),
(Trip1)-[:VISITED]->(Earth),
(Trip1)-[:VISITED]->(Mars),
(Trip1)-[:USES]->(Vehicle1),
(Vehicle1)-[:CARRIED]->(Trip1),
(Vehicle1)-[:STATIONED_AT]->(Earth),
(TomH)-[:PILOTED]->(Trip1),
(MegR)-[:RIDDEN]->(Trip1);

// === Trip2 Connections (Mars → Jupiter with Cruiser) ===
MATCH
(Trip2:Trip {name: 'Gas Giant Flyby'}),
(Mars:Planet {name: 'Mars'}),
(Jupiter:Planet {name: 'Jupiter'}),
(Vehicle2:Vehicle {name: 'Star Cruiser Beta'}),
(ZoeS:Passenger {name: 'Zoe Saldana'}),
(TomH:Passenger {name: 'Tom Hanks'})
CREATE
(Trip2)-[:DEPARTS_FROM]->(Mars),
(Trip2)-[:ARRIVES_AT]->(Jupiter),
(Trip2)-[:VISITED]->(Mars),
(Trip2)-[:VISITED]->(Jupiter),
(Trip2)-[:USES]->(Vehicle2),
(Vehicle2)-[:CARRIED]->(Trip2),
(Vehicle2)-[:STATIONED_AT]->(Mars),
(ZoeS)-[:ENGINEERED]->(Trip2),
(TomH)-[:PILOTED]->(Trip2);

// === Trip3 Connections (Jupiter → Earth with Freighter) ===
MATCH
(Trip3:Trip {name: 'Cargo Drop Alpha'}),
(Jupiter:Planet {name: 'Jupiter'}),
(Earth:Planet {name: 'Earth'}),
(Vehicle3:Vehicle {name: 'Cargo Freighter Gamma'}),
(ZoeS:Passenger {name: 'Zoe Saldana'}),
(MegR:Passenger {name: 'Meg Ryan'})
CREATE
(Trip3)-[:DEPARTS_FROM]->(Jupiter),
(Trip3)-[:ARRIVES_AT]->(Earth),
(Trip3)-[:VISITED]->(Jupiter),
(Trip3)-[:VISITED]->(Earth),
(Trip3)-[:USES]->(Vehicle3),
(Vehicle3)-[:CARRIED]->(Trip3),
(Vehicle3)-[:STATIONED_AT]->(Jupiter),
(ZoeS)-[:ENGINEERED]->(Trip3),
(MegR)-[:RIDDEN]->(Trip3);
```