Multiple Models

What are we going to do?

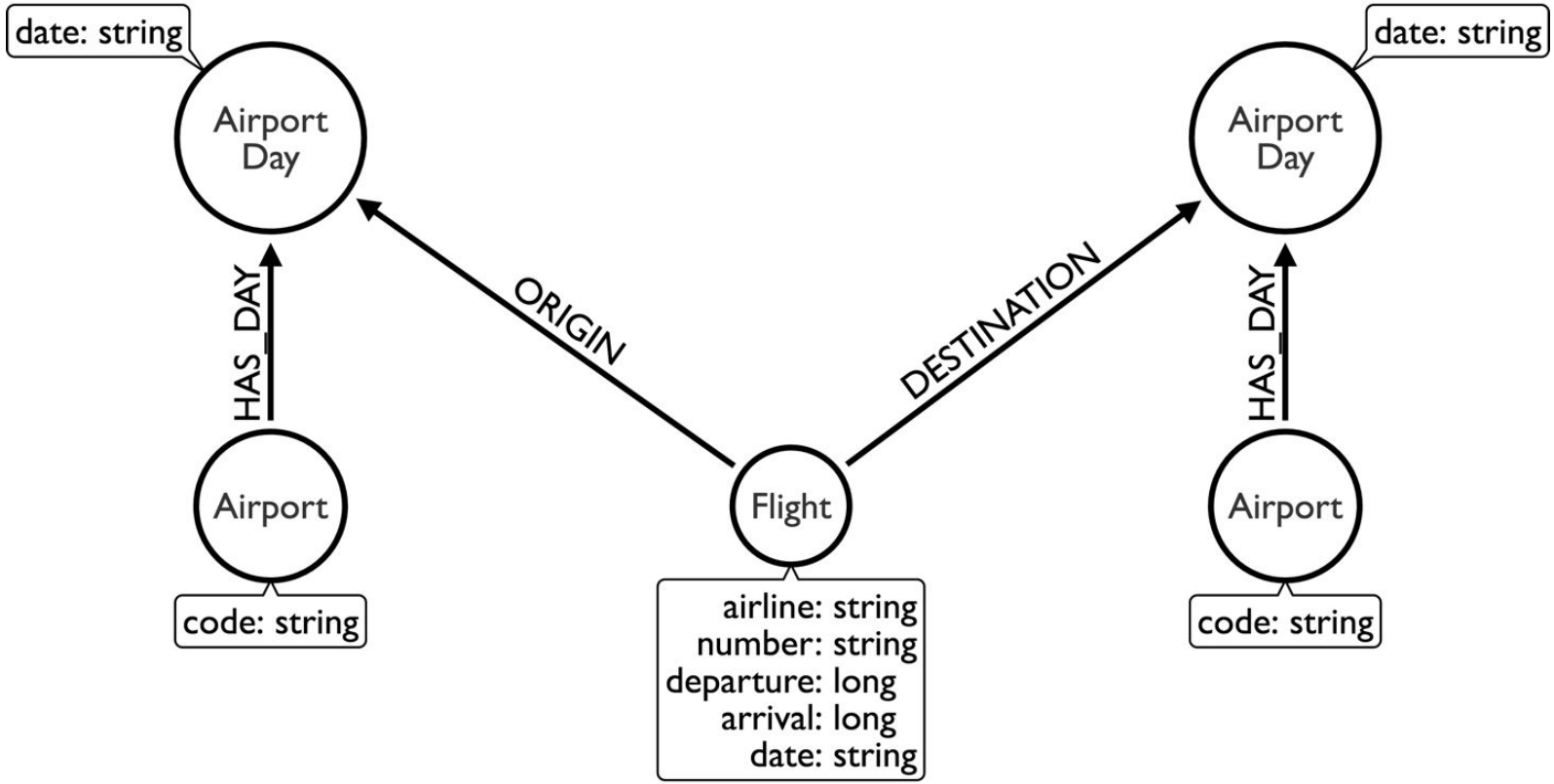
- General vs specific relationships
- The read/write tradeoff

So what's the problem?

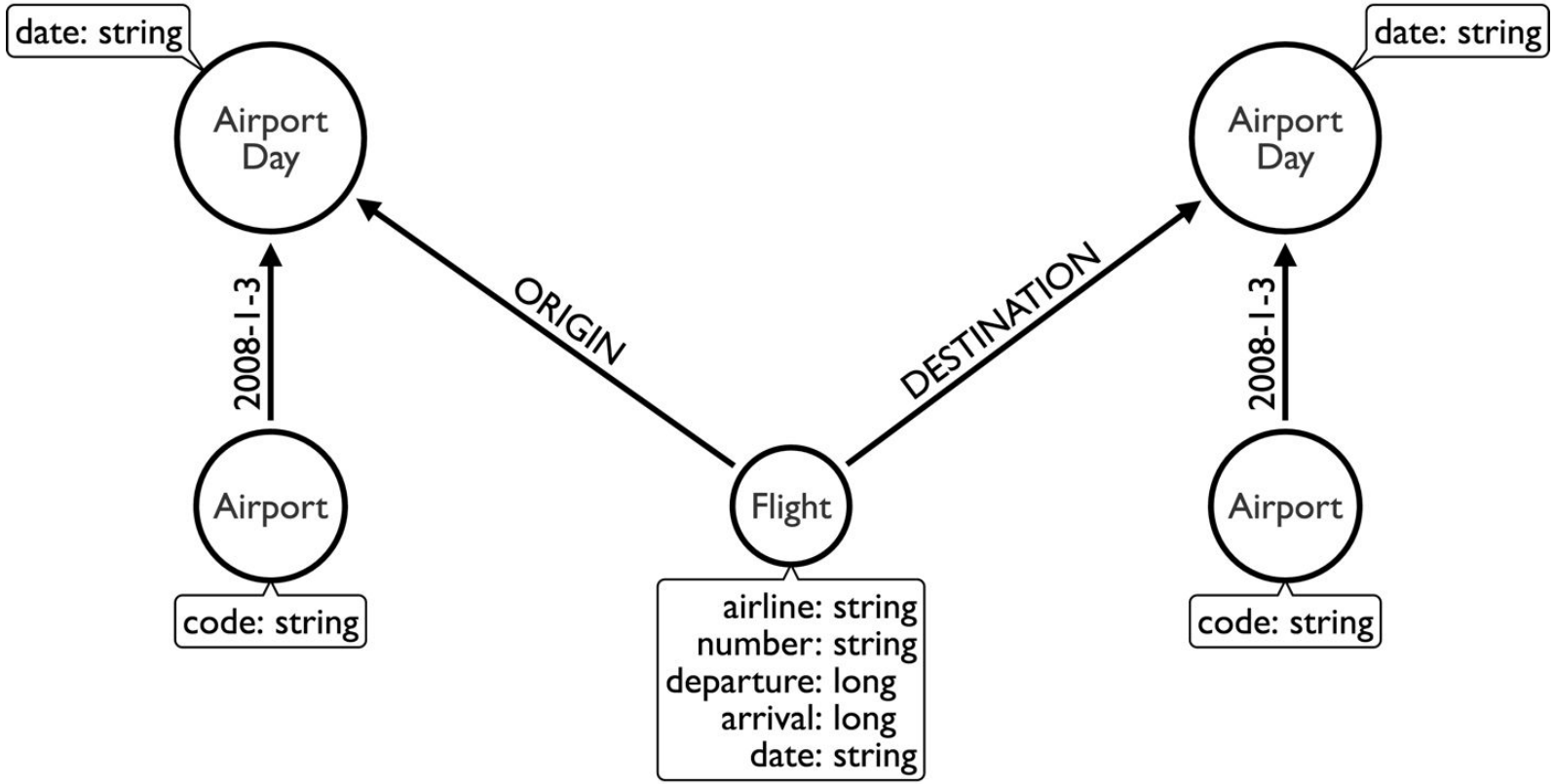
Different models perform better for different queries but worse for others

Optimising for reads may mean we pay a write and maintenance penalty

General Relationships



Specific Relationships



Find flights on a specific date: Specific wins

```
MATCH (origin:Airport {code: "LAS"})-[:`2008-1-3`]->(originDay:AirportDay),
      (originDay)<-[:ORIGIN]-(flight:Flight),
      (flight)-[:DESTINATION]->(destinationDay),
      (destinationDay:AirportDay)<-[:`2008-1-3`]-(destination:Airport {code: "MDW"})

RETURN flight.date, flight.number, flight.airline, flight.departure, flight.arrival

ORDER BY flight.date, flight.departure;
```

Find flights by year and month: General wins

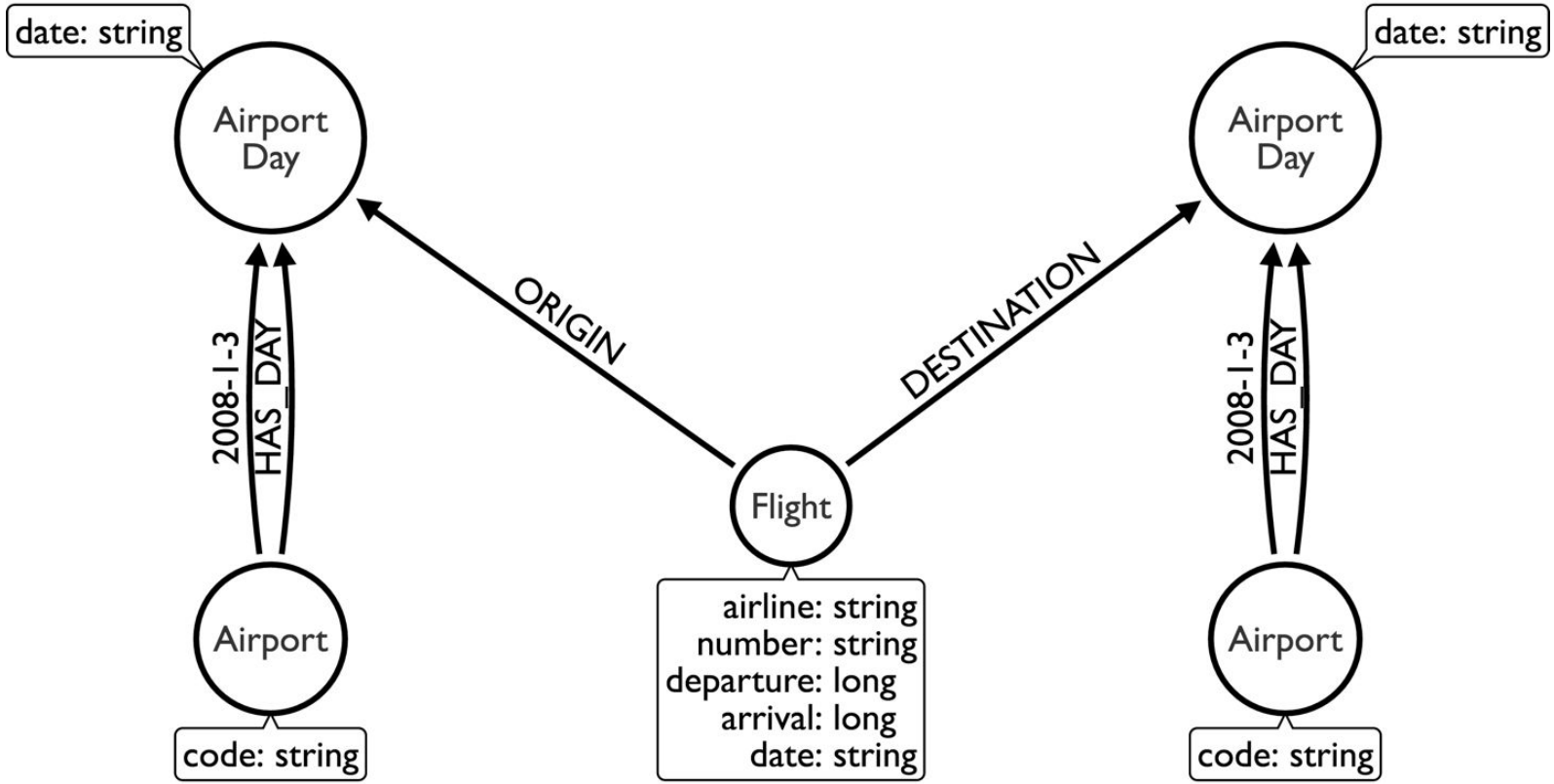
```
MATCH (origin:Airport {code: "LAS"})-[:HAS_DAY]->(originDay:AirportDay),
      (originDay)<-[:ORIGIN]-(flight:Flight)

WHERE originDay.date STARTS WITH "2008-1"

RETURN flight.date, flight.number, flight.airline, flight.departure, flight.arrival

ORDER BY flight.date, flight.departure
```

Best of both worlds?



Read/Write trade off

Read/Write trade off

By keeping both models we optimise for both the read use cases but pay a write penalty.

Adding a new day

If we want to add a new day we have to add two relationships instead of one.

```
MATCH (airport {code:  "LAX"})
MERGE (airportDay:AirportDay {id: "LAX_2008-2-1"})
ON CREATE SET airportDay.date = "2008-2-1"
CREATE (airport)-[:HAS_DAY]->(airportDay)
CREATE (airport)-[:`2008-2-1`]->(airportDay)
```

Removing a day

If we want to remove a day we have to delete two relationships instead of one.

```
MATCH (airport {code:  "LAX"})
MATCH (airportDay:AirportDay {id: "LAX_2008-1-1"})
MATCH (airport)-[general:HAS_DAY]->(airportDay)
MATCH (airport)-[specific:`2008-1-1`]->(airportDay)
DELETE general, specific
```

Start playing the next guide….

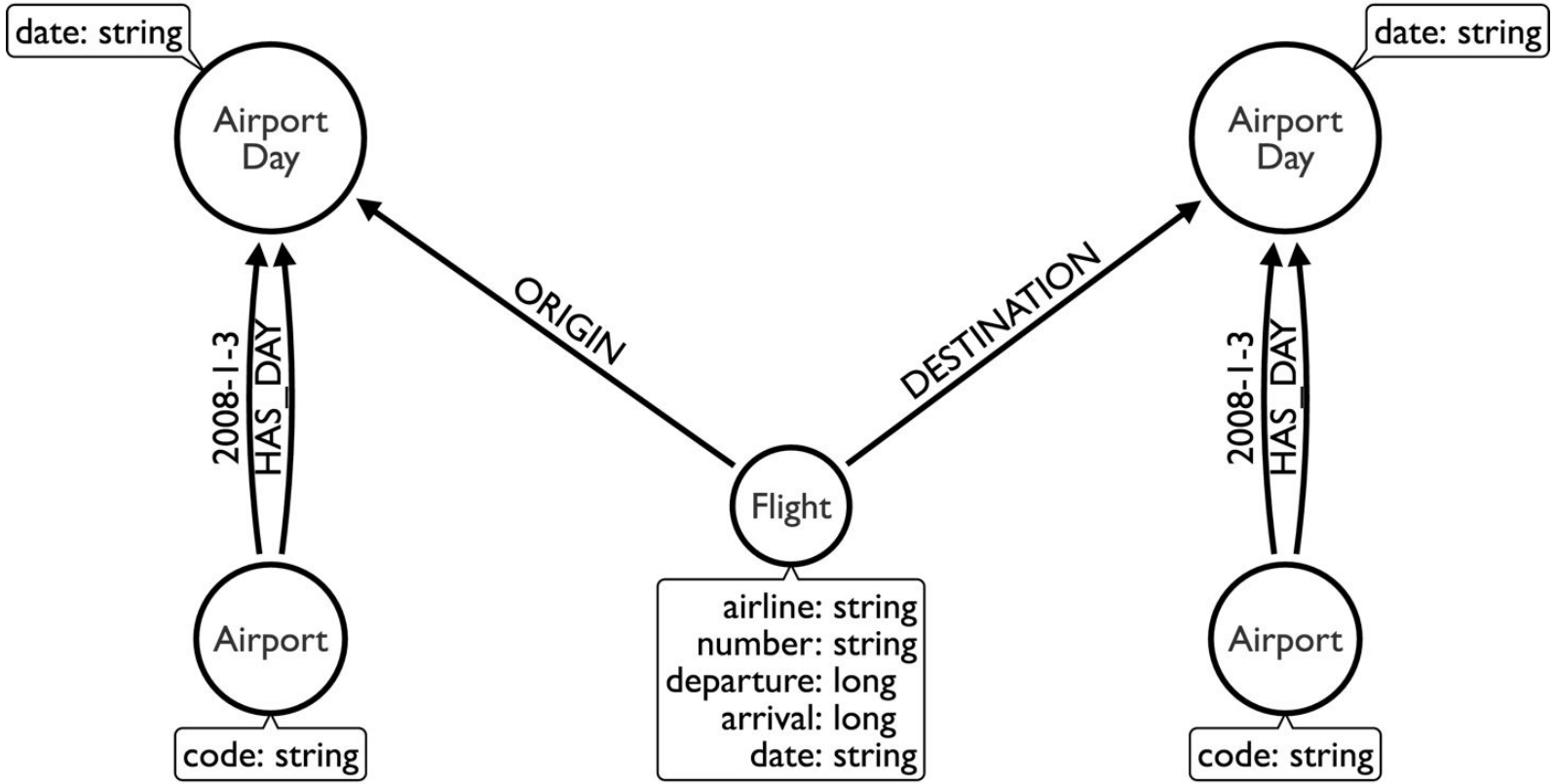
…if you aren't playing it already

```
:play http://guides.neo4j.com/modeling_airports/06_multiple_models.html
```

Do we need multiple models?

Questions ?

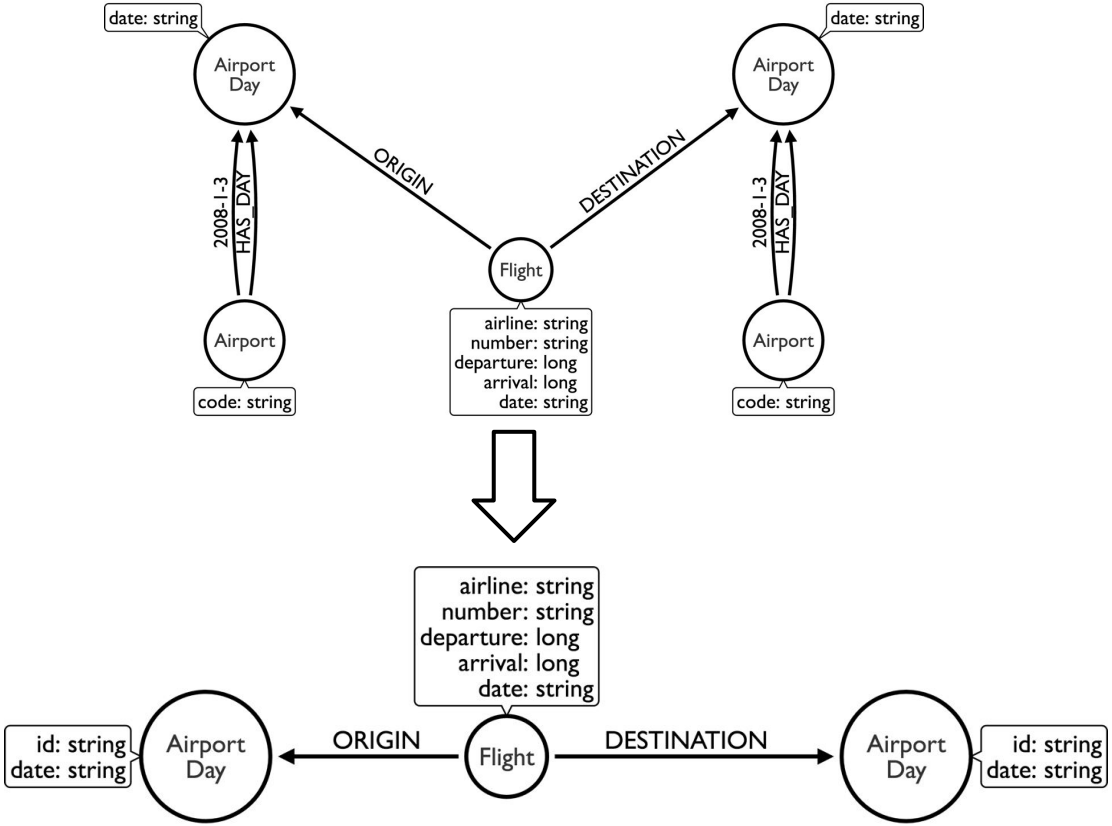
Our current model



Shrinking the model

At the start of the day the first thing we did was create `Airport` nodes but we actually don’t need them anymore!

Flight as a first class citizen



Let’s get on with the refactoring

Continue playing the guide in your browser

Multiple Models