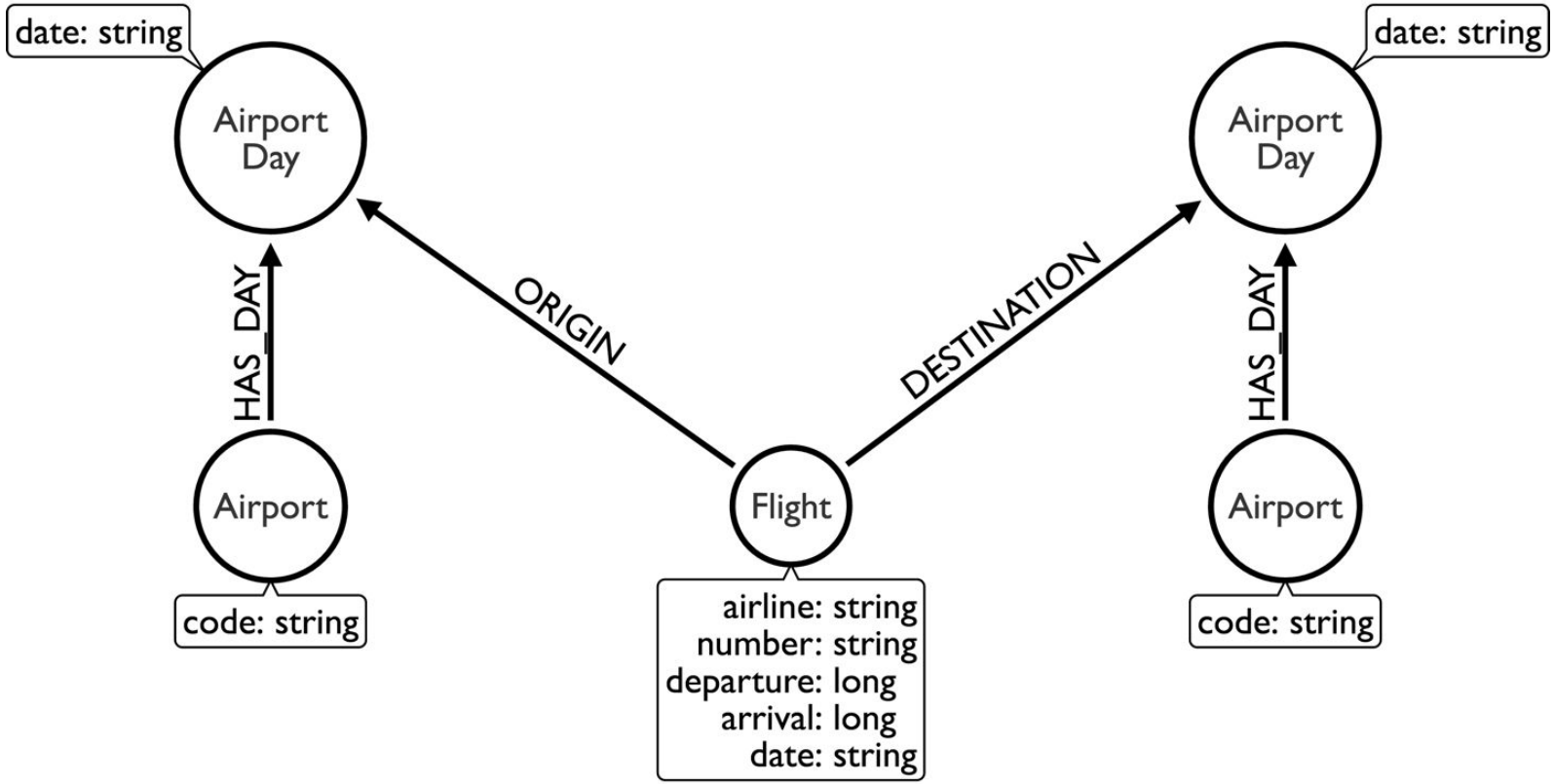
Modeling Guidelines

What are we going to do?

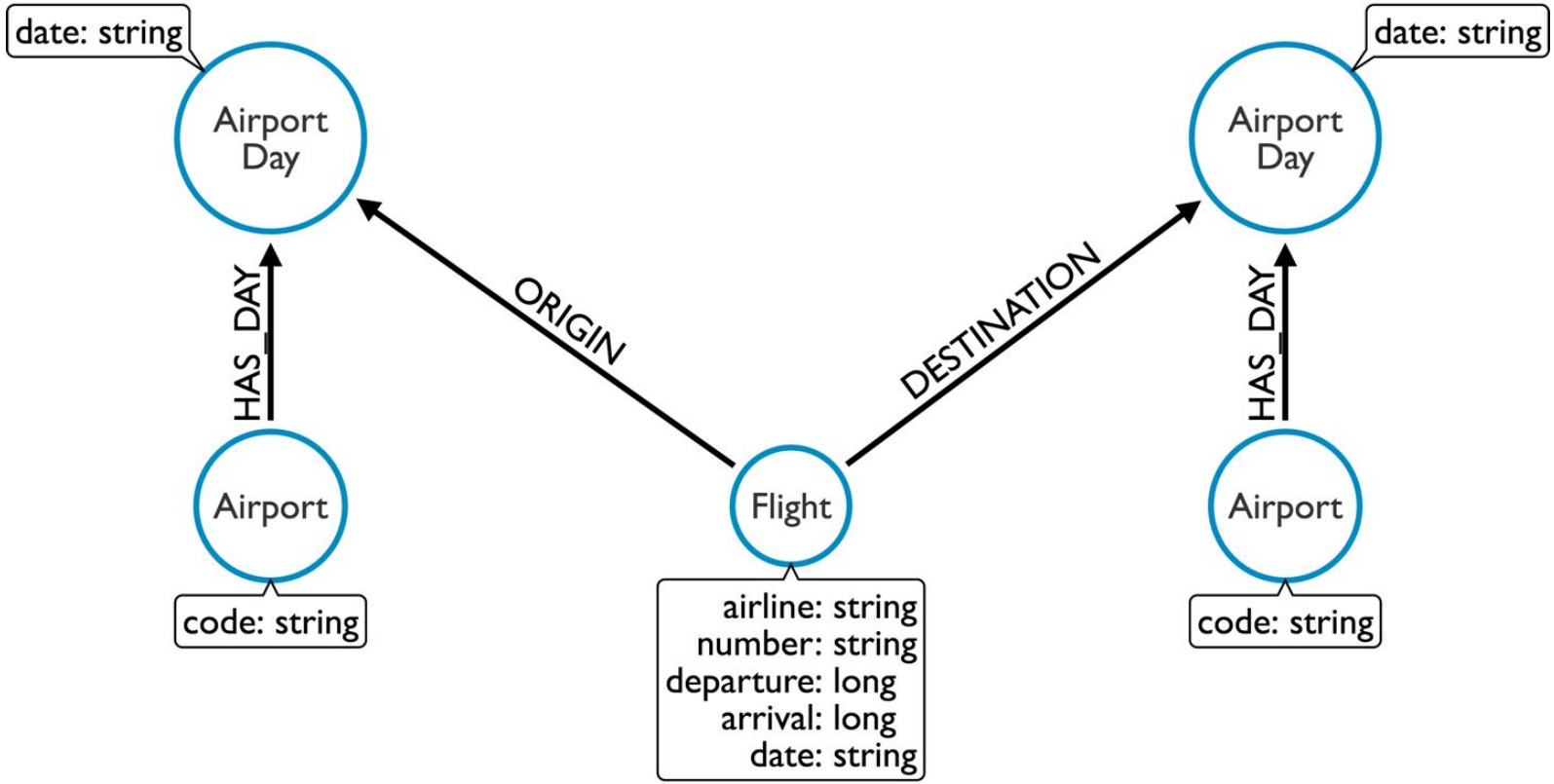
- Recap of the Property Graph Model
- Modeling choices
- Refactorings

Nodes, relationships, labels, properties

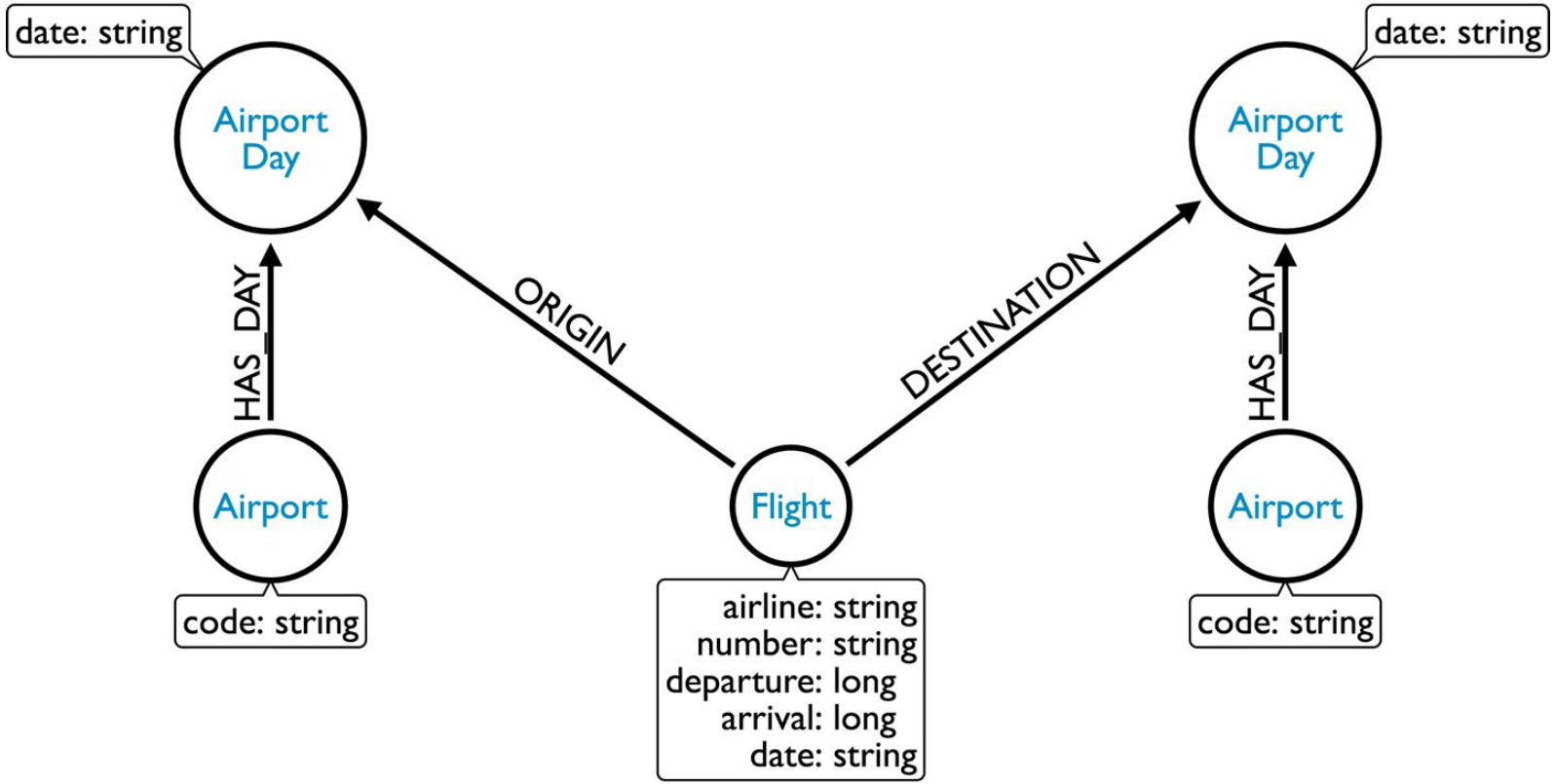
Our model


date: string
Airport Day
HAS_DAY
Airport
code: string
ORIGIN
Flight
airline: string
number: string
departure: long
arrival: long
date: string
DESTINATION
date: string
Airport Day
HAS_DAY
Airport
code: string

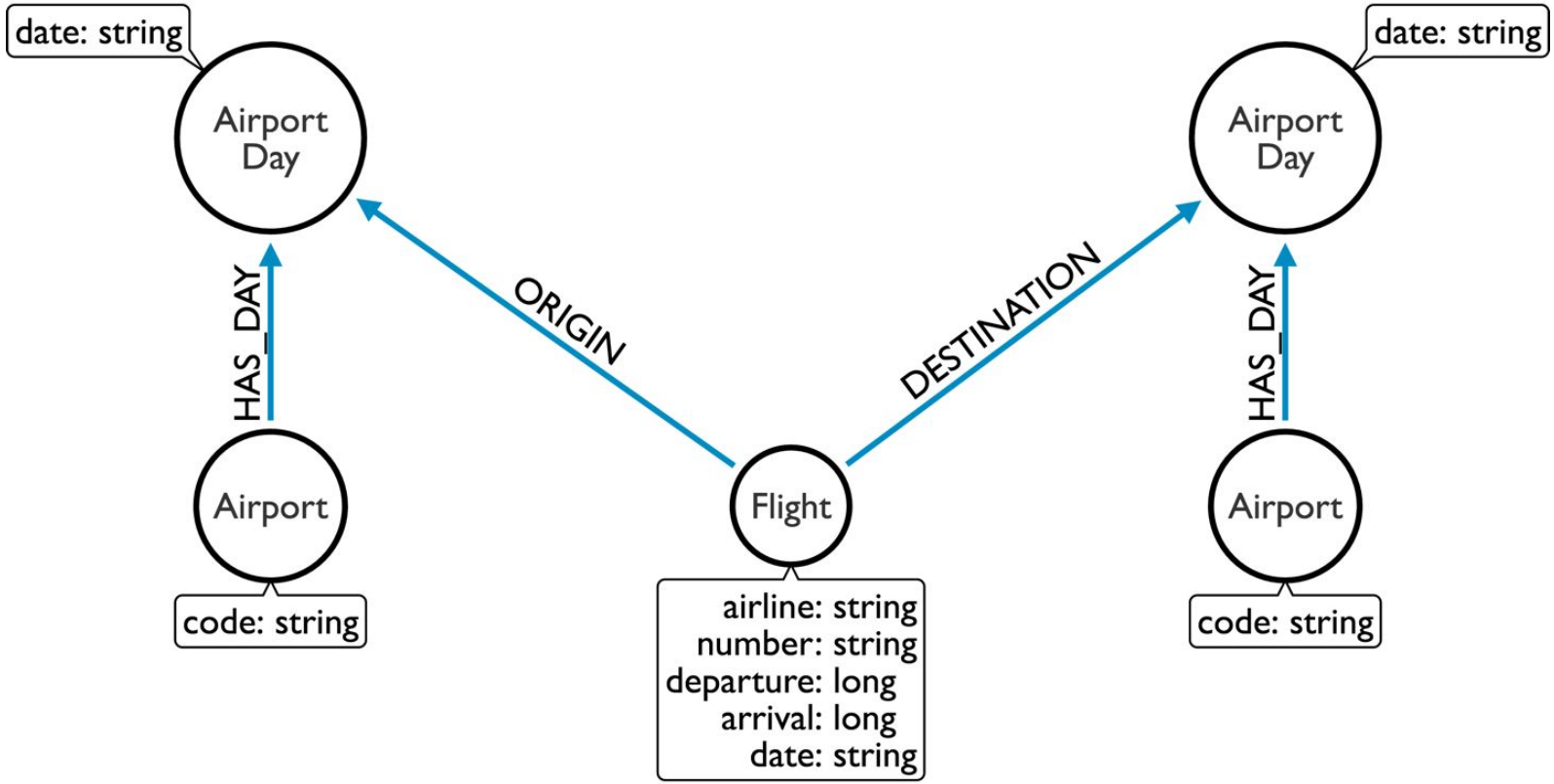
Nodes are for things



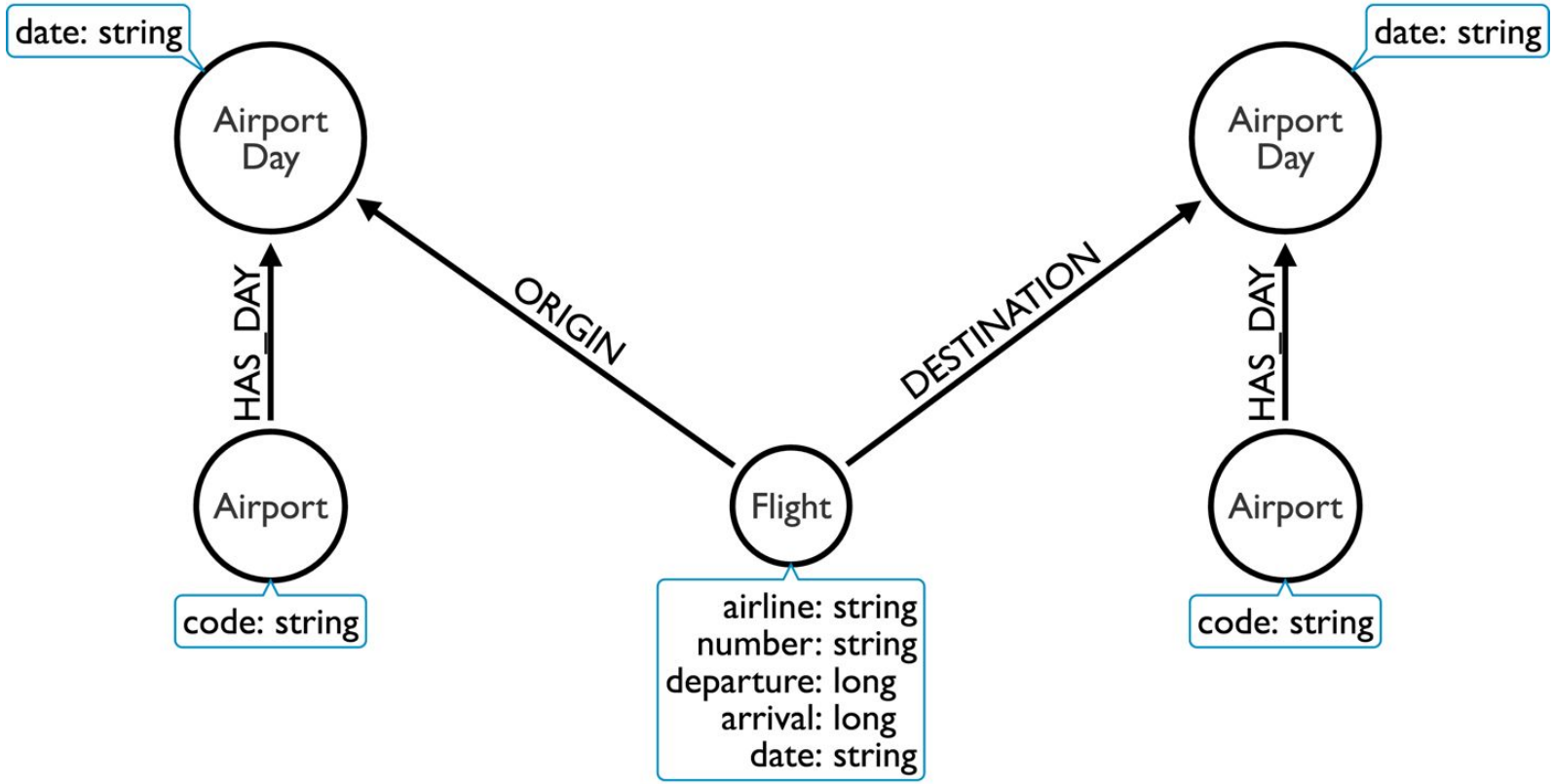
Labels for grouping



Relationships for structure



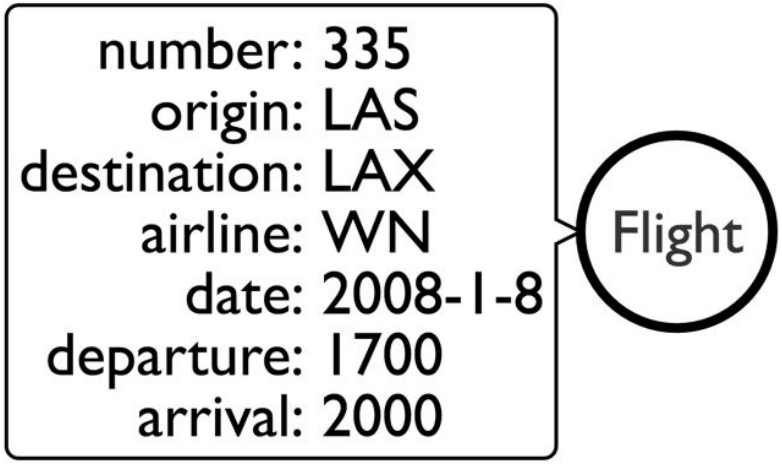
Properties for attributes

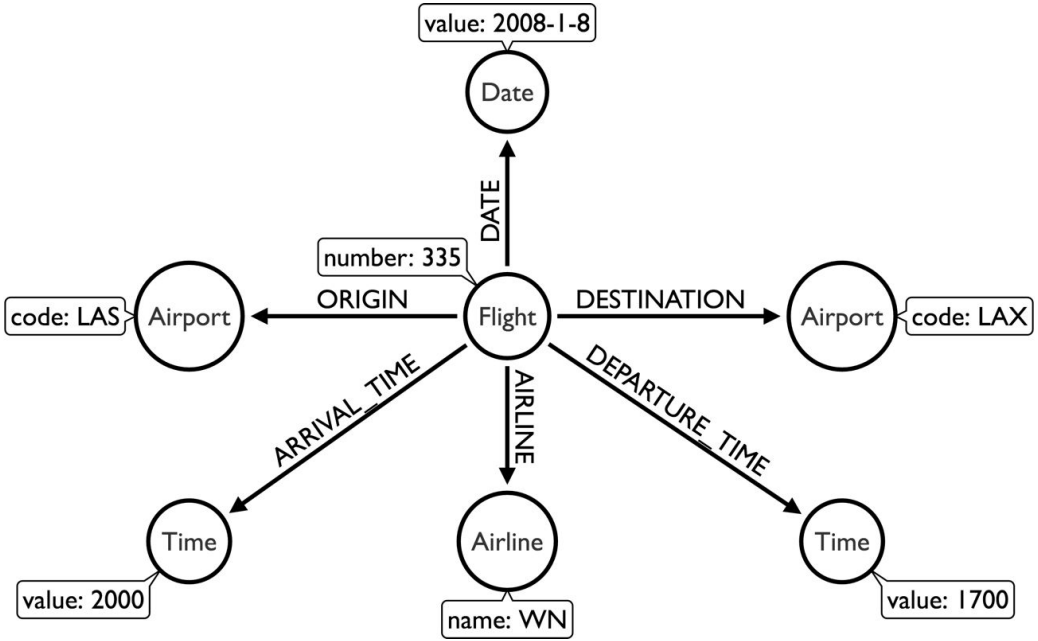


Modeling choices

Properties vs. Relationships

Properties vs Relationships





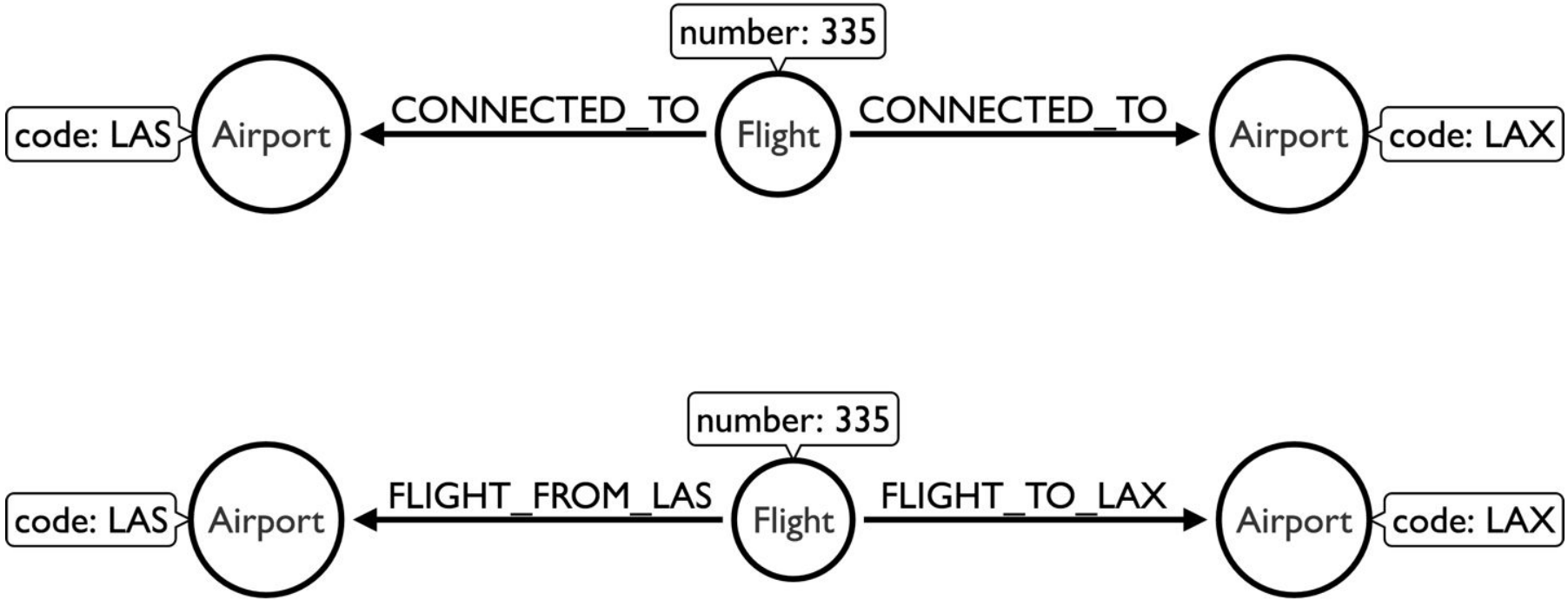
Properties vs Relationships

We only need to pull out a node if we're going to query through it, otherwise a property will suffice.

But if we pull out every single property then we end up with an RDF model and lose the benefit of the property graph

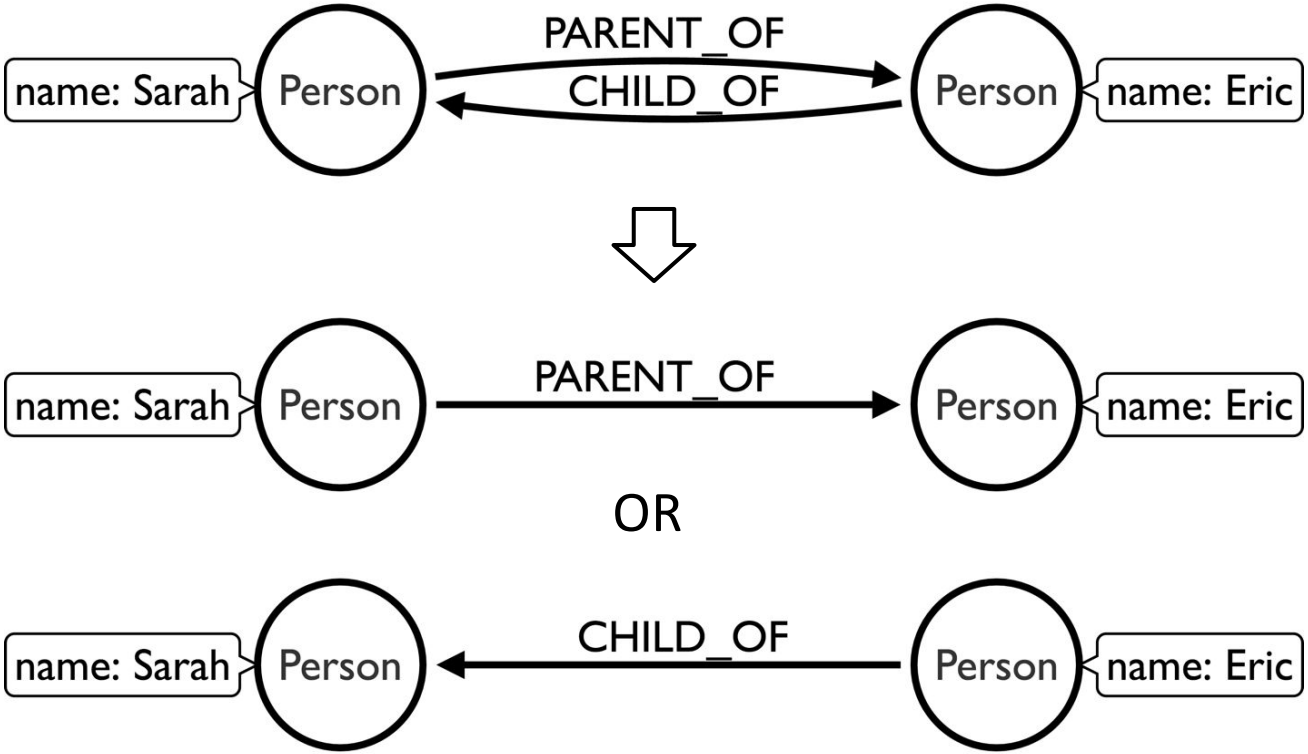
Relationship Granularity

Relationship Granularity



Symmetric Relationships

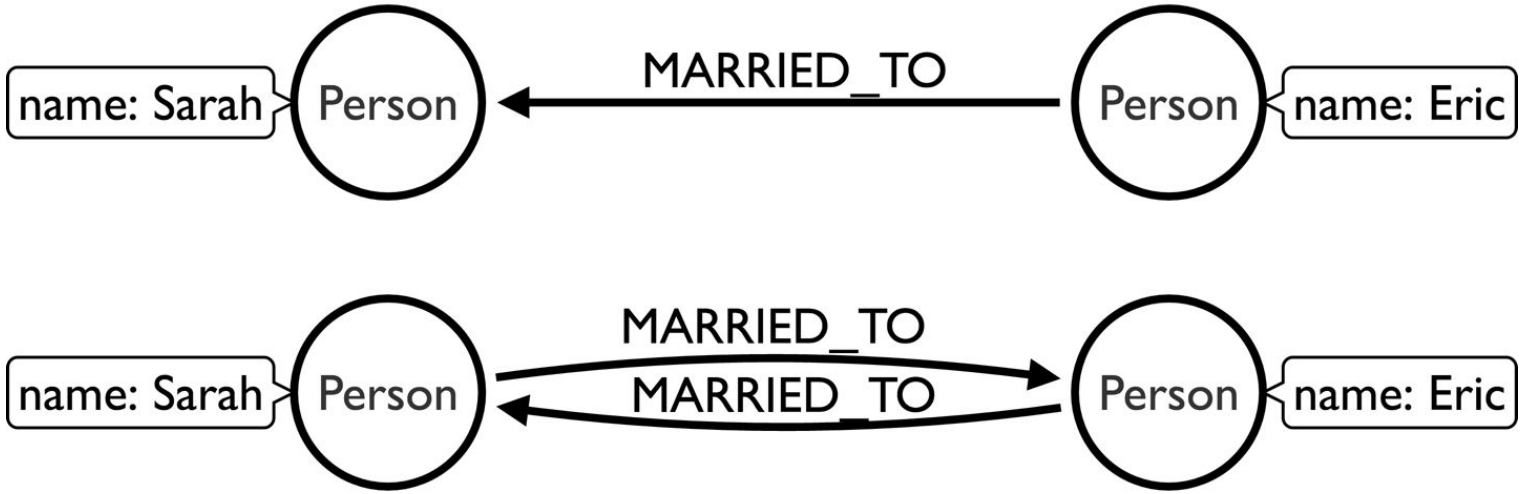
Symmetric relationships



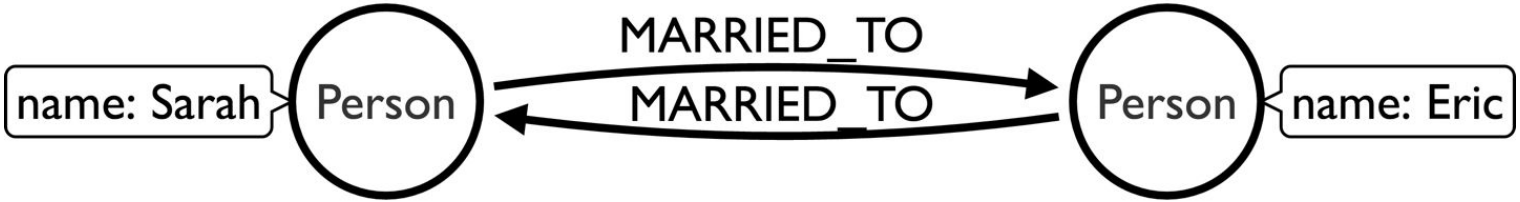
Bidirectional Relationships

Bidirectional relationships

No need to have the relationship in both directions



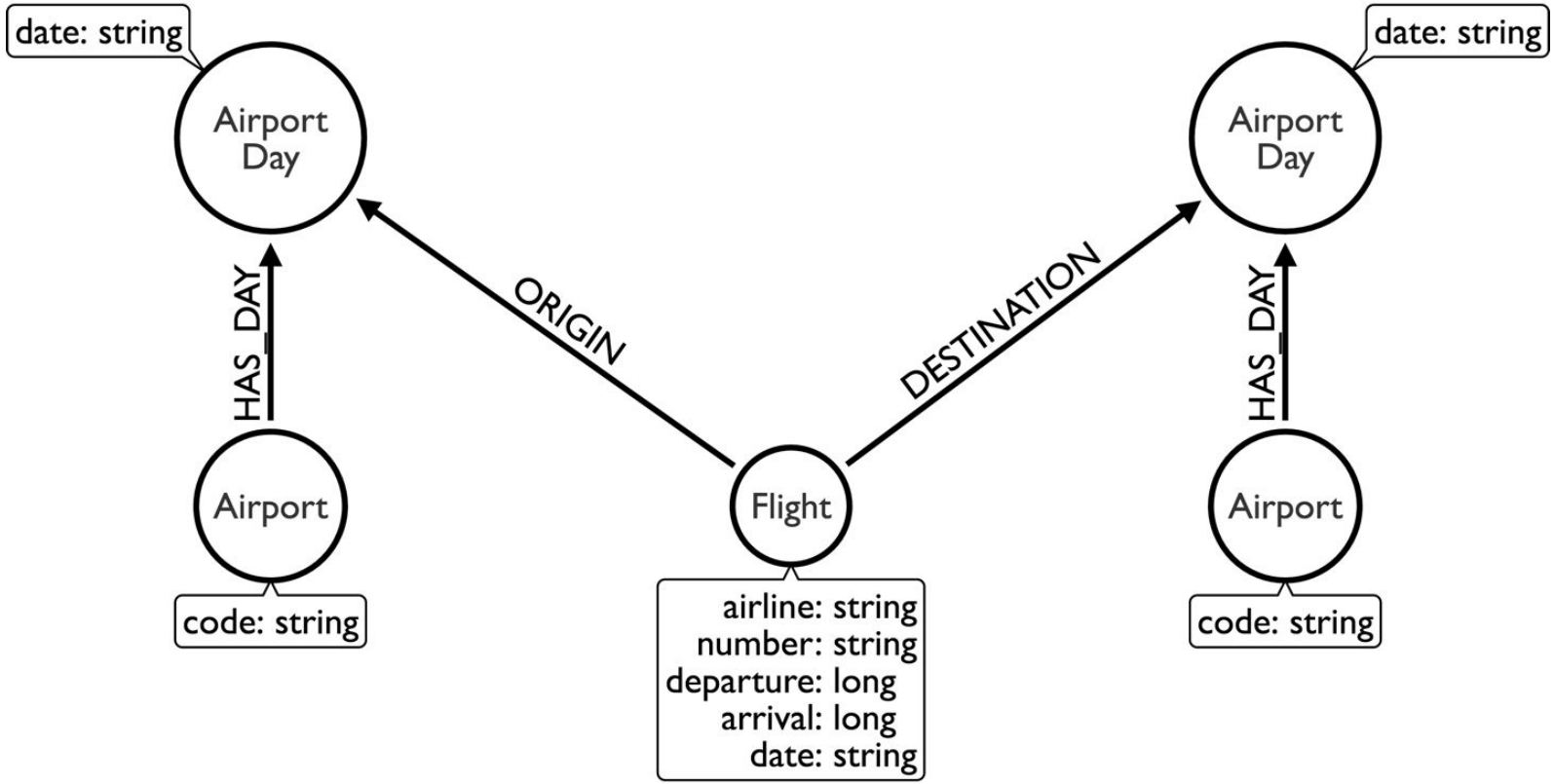
Use single relationship and ignore direction in queries



```
MATCH (:Person {name:'Eric'})-[:MARRIED_TO]-(p2)
RETURN p2
```

General vs. Specific Relationships

General Relationships



General: Find flights on a specific date

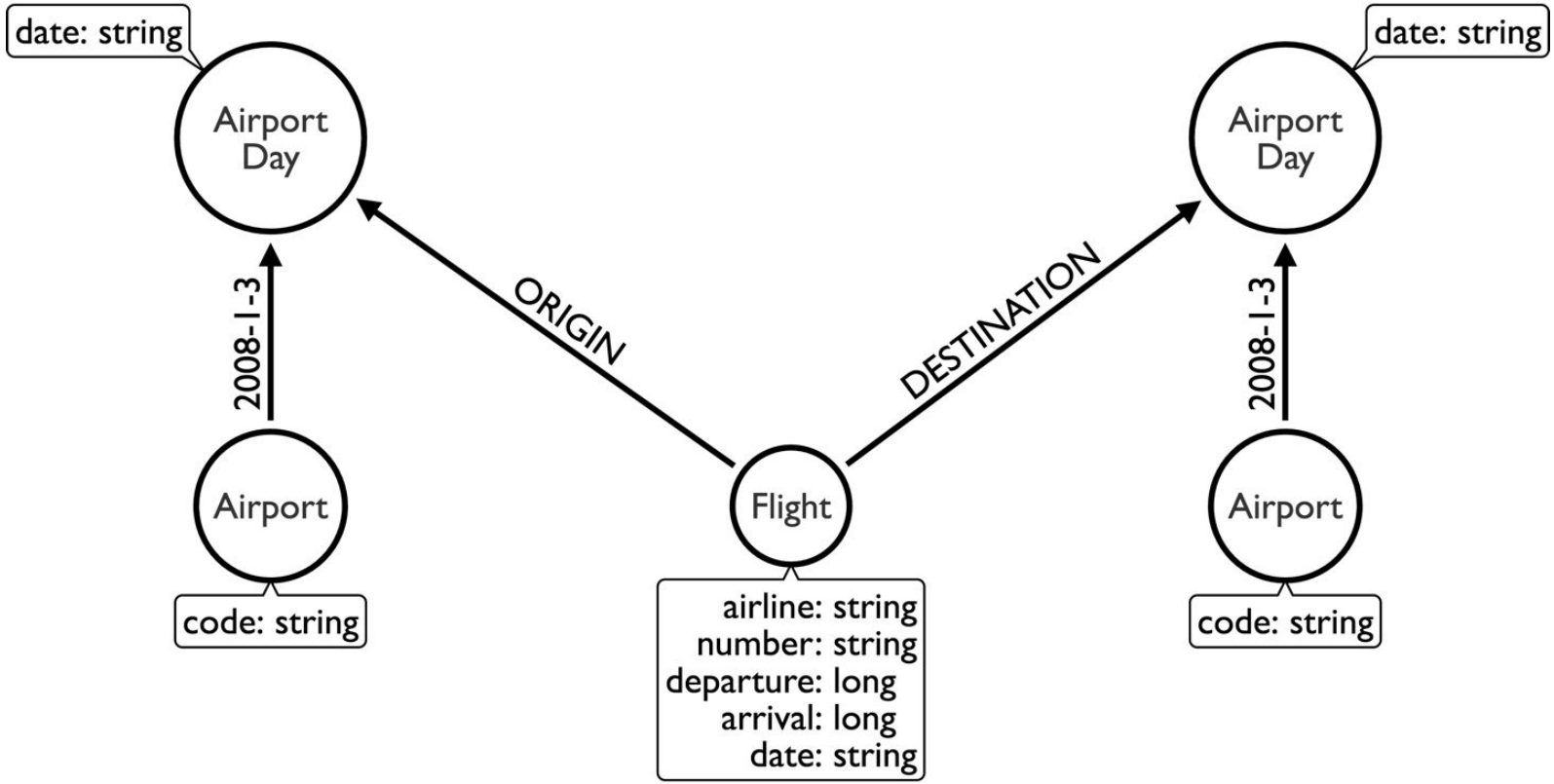
```
MATCH (origin:Airport {code: "LAS"})-[:HAS_DAY]->(originDay:AirportDay),
      (originDay)<-[:ORIGIN]-(flight:Flight),
      (flight)-[:DESTINATION]->(destinationDay),
      (destinationDay:AirportDay)<-[:HAS_DAY]-(destination:Airport {code: "MDW"})

WHERE originDay.date = "2008-1-3" AND destinationDay.date = "2008-1-3"

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

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

Specific Relationships



Specific: Find flights on a specific date

```
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;
```

General: Find flights by year and month

```
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
```

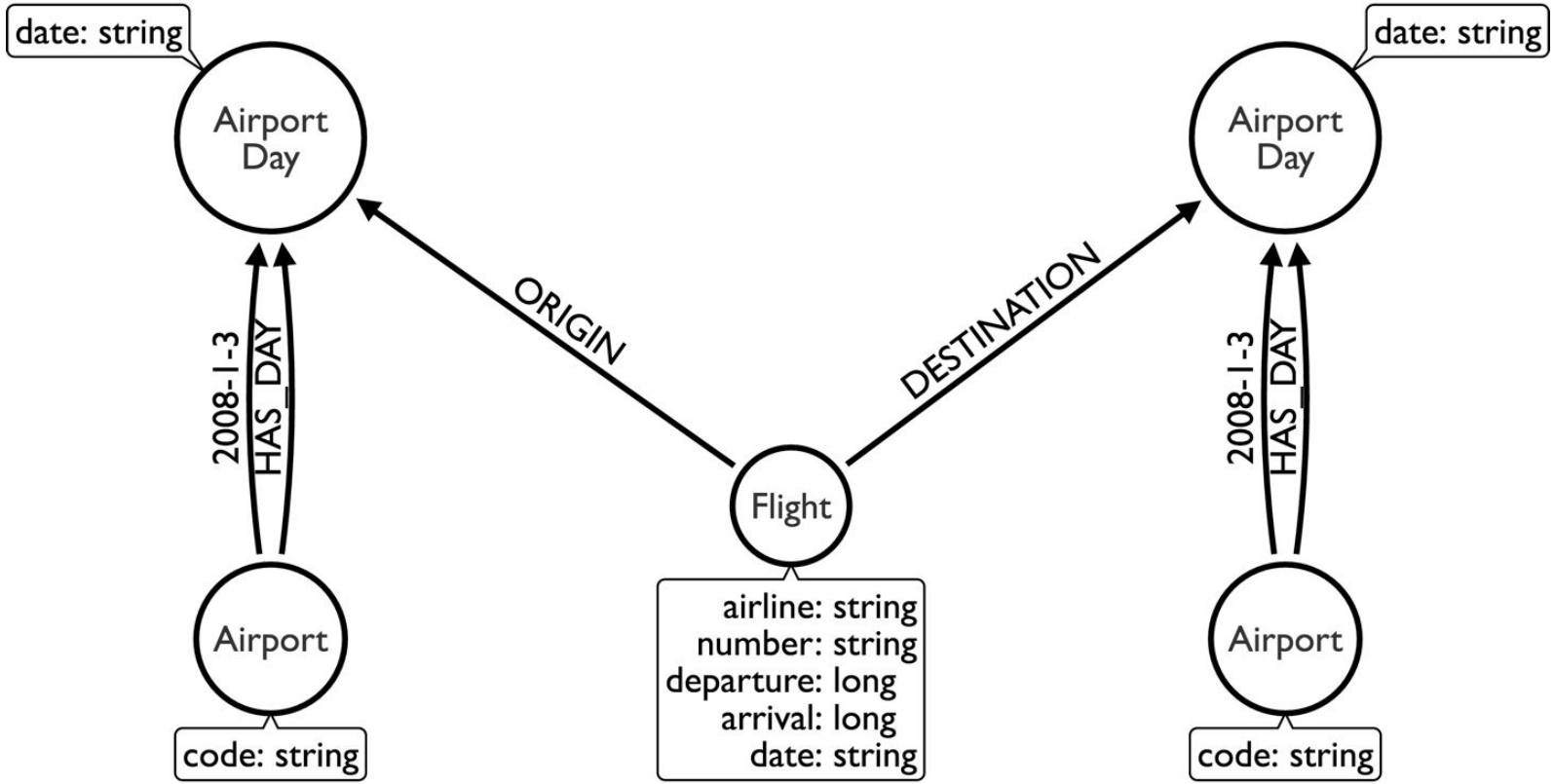
Specific: Find flights by year and month

```
MATCH (origin:Airport {code: "LAS"})
       -[:`2008-1-3`|:`2008-1-4`|:`2008-1-5`|:`2008-1-6`]->(originDay:AirportDay),
      (originDay)<-[:ORIGIN]-(flight:Flight)

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

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

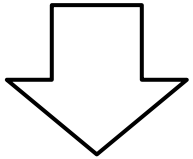
Best of both worlds?



Refactorings

Derive node from relationship

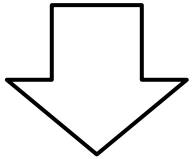
```
(origin)-[:CONNECTED_TO]->(destination)
```



```
(origin)<-[:ORIGIN]-(flight)-[:DESTINATION]->(destination)
```

Derive node from property

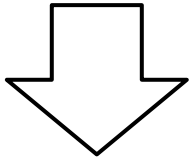
```
(origin)<-[:ORIGIN]-(flight)-[:DESTINATION]->(destination)
```



```
(origin)-[:HAS_DAY]->(originAirportDay)<-[:ORIGIN]-(flight),
(destination)-[:HAS_DAY]->(destAirportDay)<-[:DESTINATION]-(flight)
```

Derive relationship from property

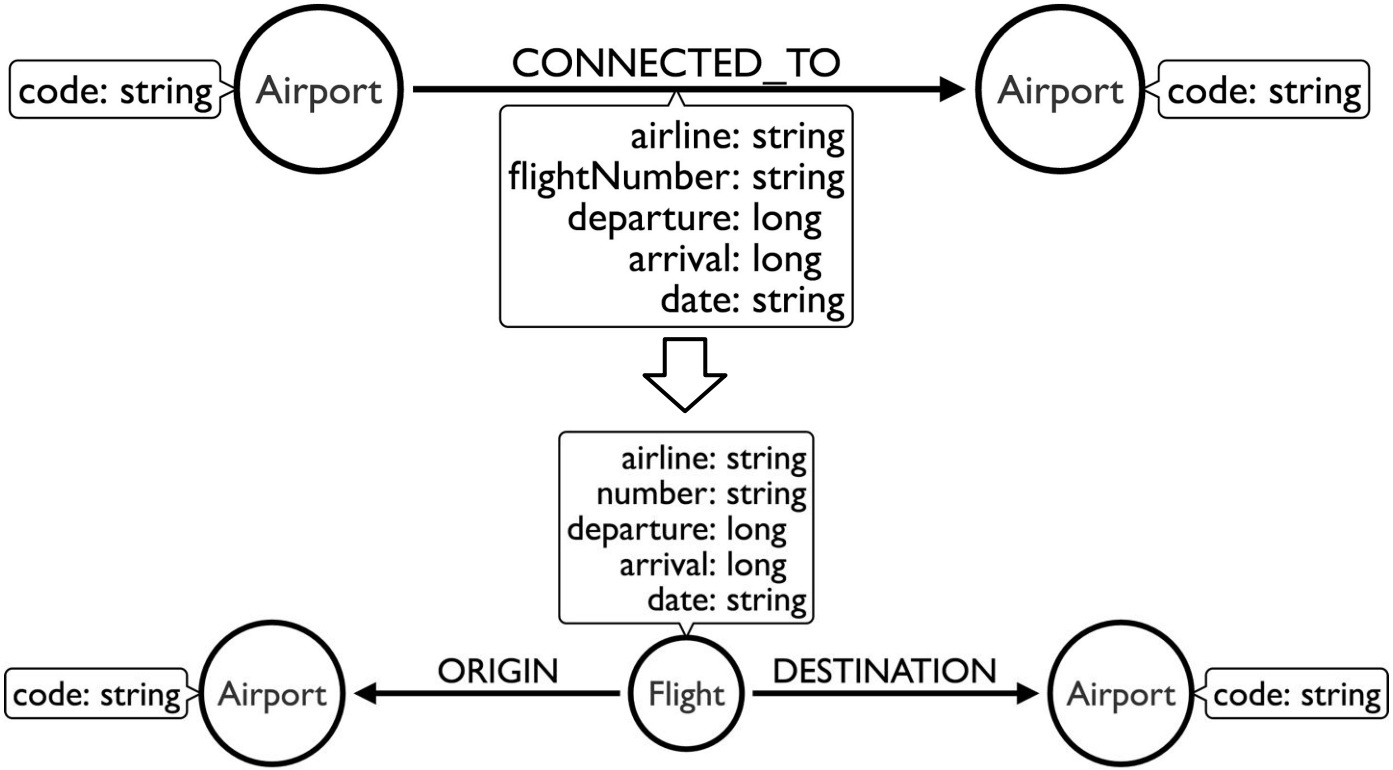
```
(airport)-[:HAS_DAY]->(airportDay {date: "2008-1-3"})
```



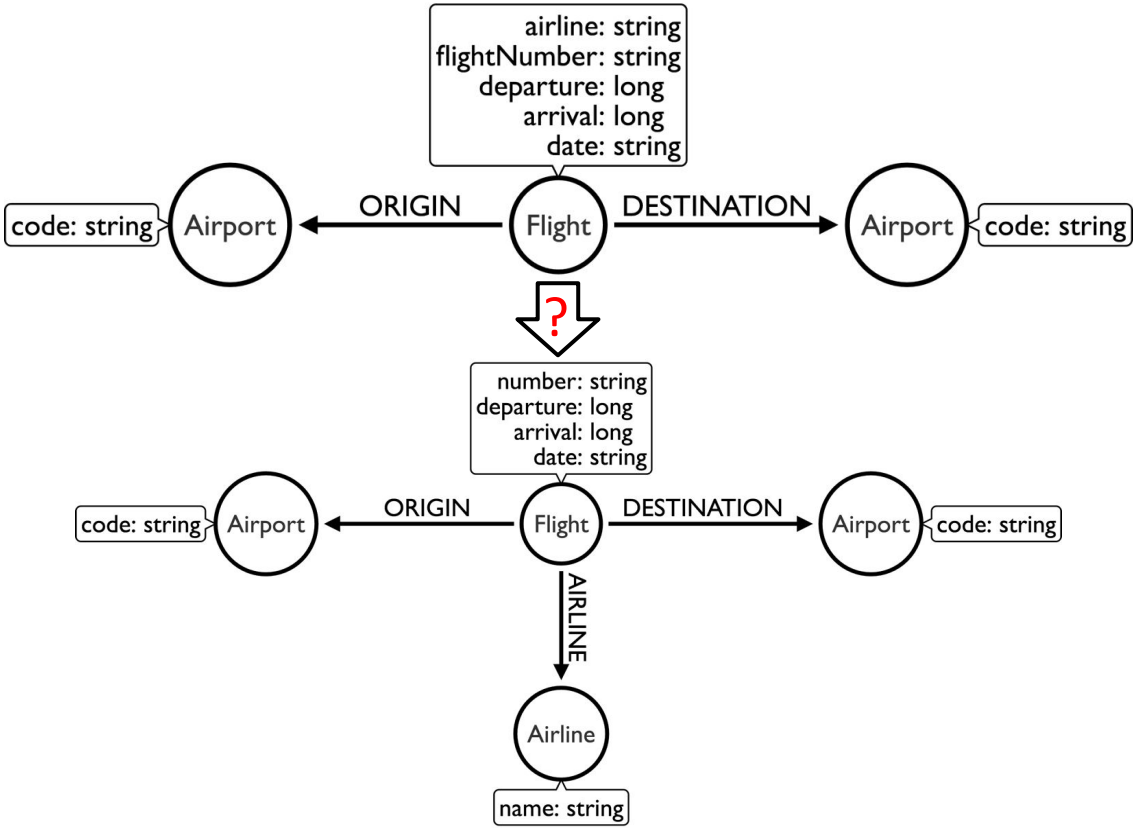
```
(airport)-[:`2008-1-3`]->(airportDay {date: "2008-1-3"})
```

Evolving the Model

Revealing nodes



Revealing nodes?



End of Module
Modeling Guidelines

Questions ?