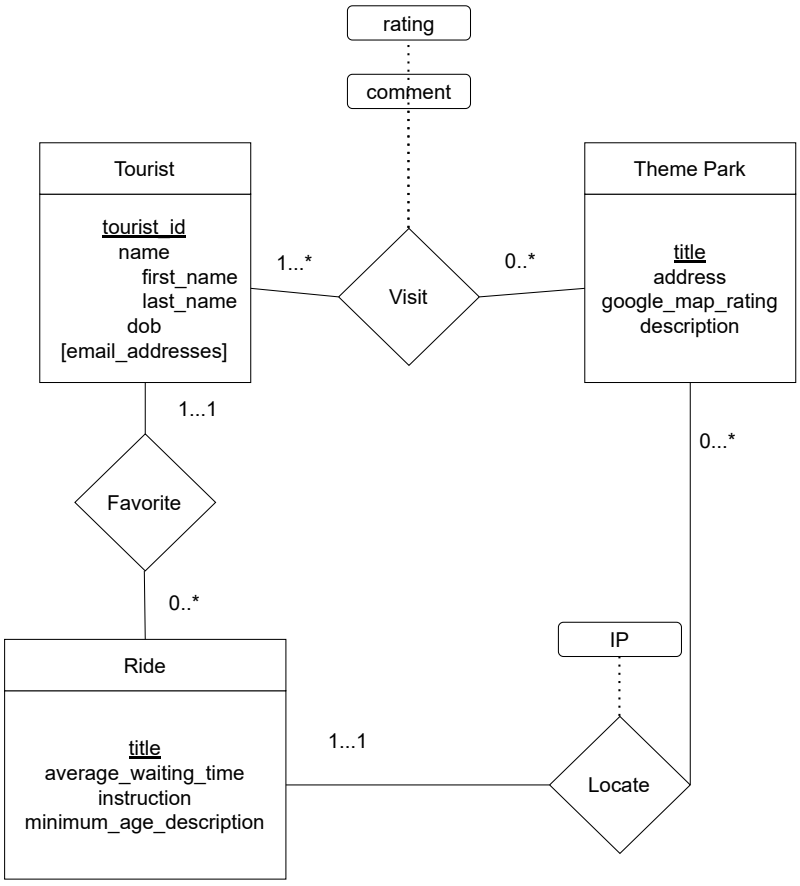
CS 6083: Principles of Database Systems
Homework 1
Professor Phyllis Frankl

Name: Junior Francisco Garcia
NYU ID: jfg388
Date: 2024-02-08

1. Problem 1 Assumptions:

   - We are assuming that our theme park can have 0 Rides associated to it (although uncommon) .

   (a) A



   (b) B

- **Tourist**
  - (11242985, Junior, Garcia, 1990-01-01, jfg388@nyu.edu) ∈ Tourist
  - (20987654, Alex, Johnson, 1985-05-15, {alex.j@example.com, ajohnson@workplace.com }) ∈ Tourist
  - (31578906, Maria, Rodriguez, 1992-10-22, m.rodriguez@example.com) ∈ Tourist
- **Theme Park**
  - (Universal Studios, 6000 Universal Blvd, Orlando, FL 32819, 4.7, One of the most famous theme parks with thrilling rides and shows.) ∈ Theme Park
  - (Disneyland, 1313 Disneyland Dr, Anaheim, CA 92802, 4.9, Iconic theme park known for its classic characters and magical experiences.) ∈ Theme Park
  - (Legoland, 1 Legoland Way, Winter Haven, FL 33884, 4.5, Family theme park offering interactive attractions) ∈ Theme Park
- **Ride**
  - (Pirate's Plunge, 20 minutes, Embark on a thrilling pirate adventure with steep drops and splashing waves, 6) ∈ Ride
  - (Space Mountain, 45 minutes, Futuristic space-themed roller coaster ride in the dark with sharp turns and sudden drops., 10) ∈ Ride
  - (The Dragon, 30 minutes, Family-friendly roller coaster taking you through a medieval castle with gentle twists and turns, 4) ∈ Ride

(c) C

- **Visit** relationship set example:
  - (11242985, Universal Studios, 5, Best ride of my life!) ∈ Visit
- **Favorite** relationship set example:
  - (11242985, Pirate's Plunge) ∈ Favorite
- **Locate** relationship set example:
  - (Universal Studios, Pirate's Plunge, Pirates of the Caribbean) ∈ Locate

2. Problem 2

Assumptions:

- We are assuming that flight numbers are indeed unique and there would be no repetition/re-use of flight numbers across days.
- We are assuming that an aircraft type can have multiple layouts and that it must have a layout.

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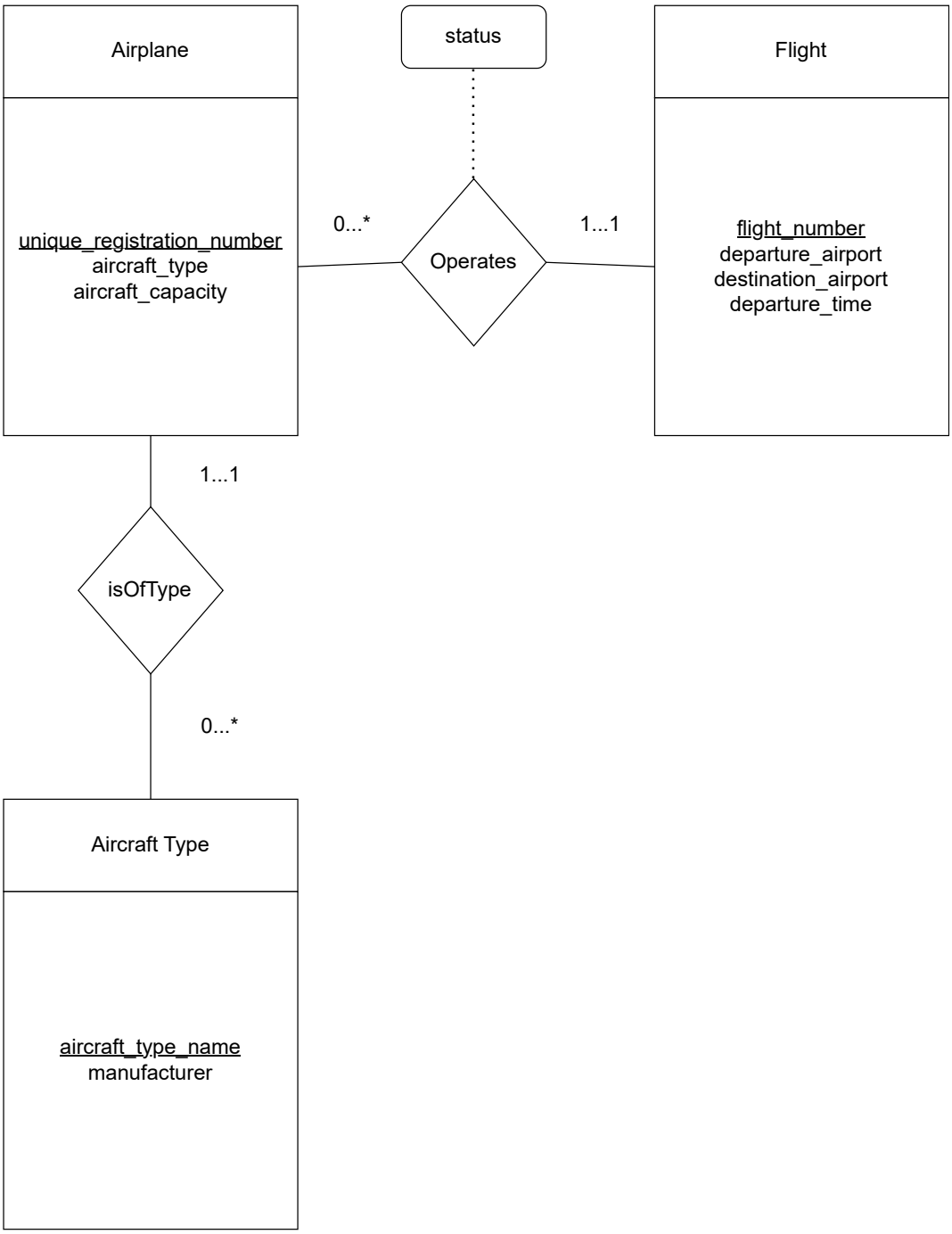
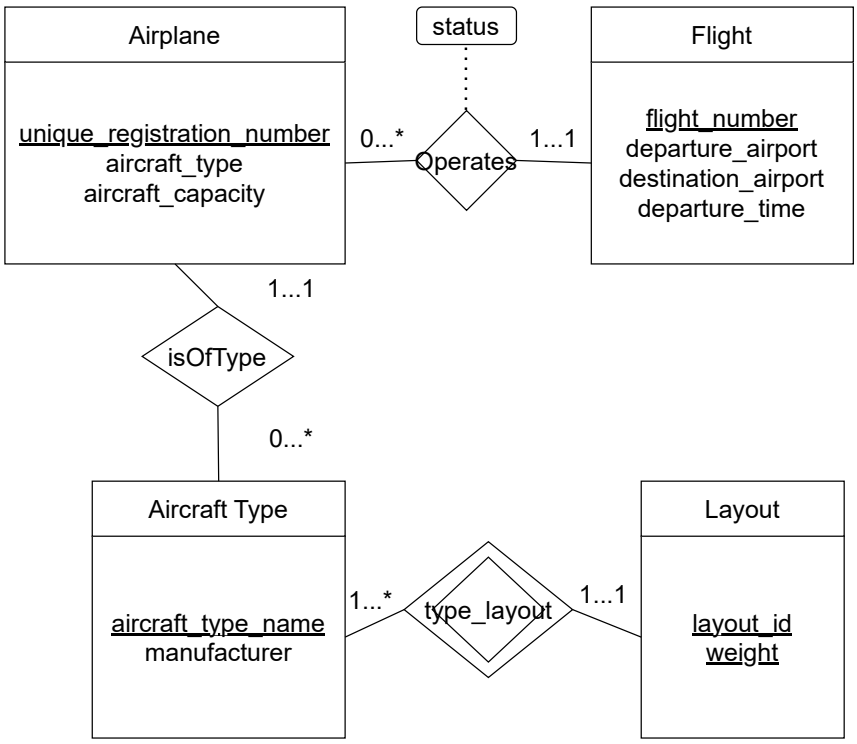
(a) A



(b) B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aircraft_capacity
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Operates
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departure_airport
destination_airport
departure_time
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isOfType
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Aircraft Type
Layout
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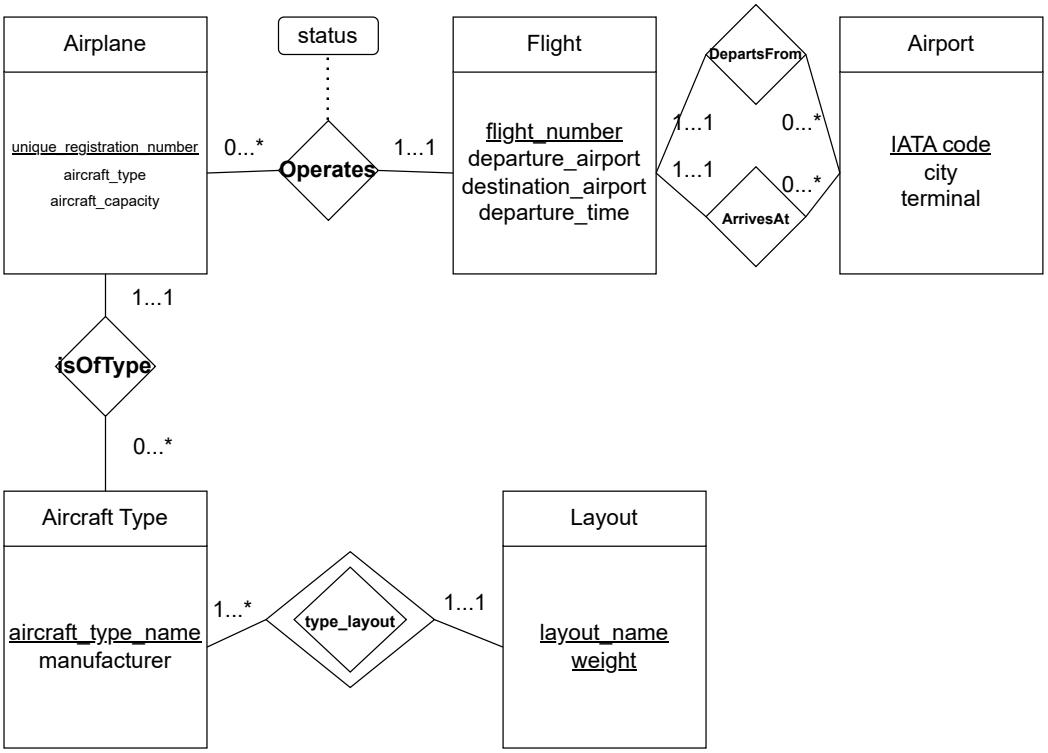
manufacturer
1...*
type_layout
1...1
layout_id
weight

(c) C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departure_airport
destination_airport
departure_time
DepartsFrom
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0...*
1...1
0...*
ArrivesAt
Airport
IATA code
city
terminal
1...1
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Aircraft Type
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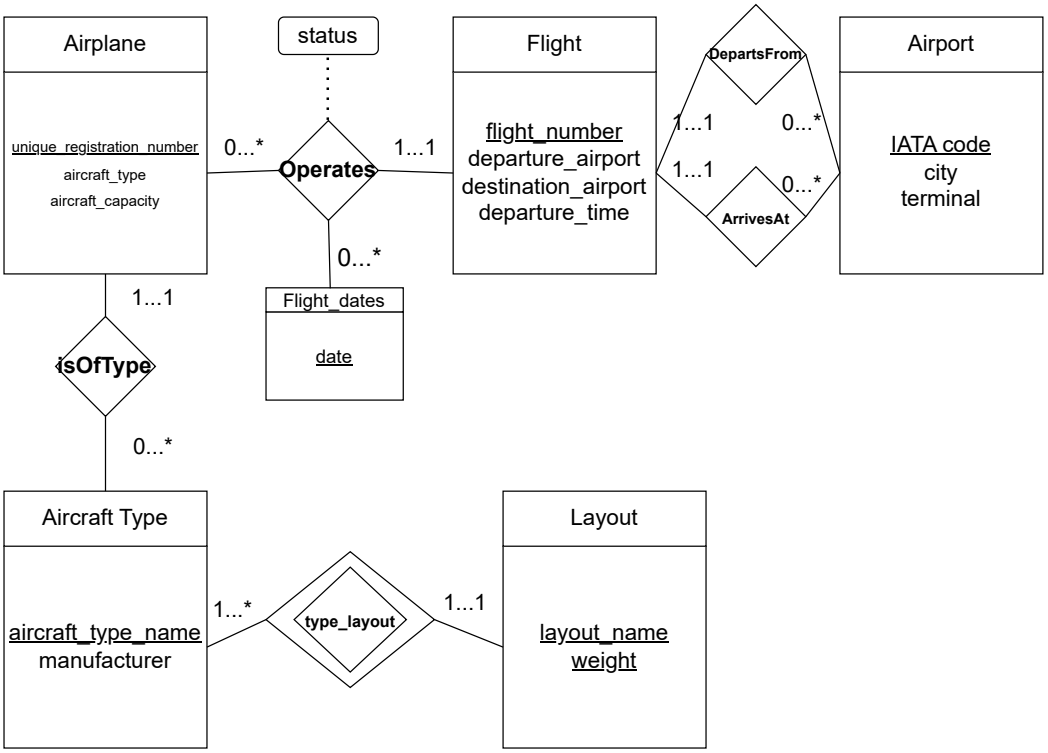
manufacturer
1...*
type_layout
1...1
Layout
layout_name
weight

(d) D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status
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Operates
1...1
Flight
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departure_airport
destination_airport
departure_time
DepartsFrom
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city
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Aircraft Type
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manufacturer
1...*
type_layout
1...1
Layout
layout_name
weight

3. Problem 3

   (a) A

      i. Each book has exactly one author: **No**
      ii. Each book can be published by different publishers: **Yes**
      iii. Each book has at least one category: **Yes**
      iv. A customer can only purchase one copy for each book in one order: **Yes**
      v. A customer can have different books in one orde: **No**
      vi. Each Author writes at least one book: **No**
      vii. A customer can purchase two copies of the same book as long as they are in different orders: **Yes**

   (b) B

   Entity Sets

   Book(isbn, title, publish_date, price)
   Category(category_id, name, description)
   Customer(customer_id, first_name, last_name, city,state, zip_code)
   Order(order_id, order_date, ship_date, ship_address)
   Author(author_id, first_name, last_name,URL)
   Publisher(publisher_id, pub_name, headquarter,phone)
   OrderItem(order_id, price_per_item, item_id)

   Relationship Sets

   Publish(ISBN, publisher_id)
   Write(author_id, ISBN)
   Belong(ISBN,category_id)
   create(item_id, order_id, customer_id)
   in(item_id, order_id, ISBN)