Entities and their Attributes:

- Airports
  - Name
  - Code
  - City
  - State
  - Contact Phone #
- Crew Members
  - Job
  - Employee ID
  - Name
  - Phone #
  - Availability
- Passengers
  - Frequent Flier #
  - Name
  - Address
  - Phone #
  - Emergency Contact Info
  - Seat #
- Flights
  - Date
  - Flight #
  - Captain/Pilot
  - Plane #
  - Departure Time
  - Arrival Time
- Flight History
  - Frequent Flier #
  - Flight #
  - Date
  - Seat #
  - Meal Requests
  - # of Frequent Flier Miles Accumulated
- Planes
  - Plane #
  - Type
  - Date Built
  - # of seats
  - Date Last Inspected

- Legs
  - Flight #
  - Date
  - Captain/Pilot
  - Plane #
  - Departure Time
  - Arrival Time

Relationships with Attributes (Intersection Data):

- Fly
  - Date

-We need Date associated with Planes and Flights, because different Planes fly different Flights on a day-to-day basis, and Planes don't always fly the same Flights.

- Work-on
  - Date

-We need Date associated with Crew Members and Flights, so we can uniquely identify whether a certain Crew Member (Pilot, Co-Pilot, or Attendant) worked on a specific Flight.

Dependencies:

-Flight History is a weak entity since it has an existence dependency with Passengers, and not all Passengers have a Flight History

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-Legs is a weak entity since it has an existence dependency with Flights, and not all Flights have legs

Comments:

In order to explain the cardinalities, we are considering a daily time scale. So, it is possible for a particular passenger to be on multiple flights in one day, and for multiple crew members to work on multiple flights in one day. Further, this allows us to identify a particular plane flying a particular flight on a particular day. Passengers' Frequent Flier # cannot be part of primary key, because the Entity Integrity Constraint dictates that no potential null attribute can be used in the primary key. Thus, Frequent Flier # is a FK in Passengers table of Flight History table.

Also, note that Availability would work best as an Attribute of Crew Member if it were a string, i.e., “MTuWTh 9am-9pm, F 6am-11pm.” So, the Date attribute on the Work-on relationship could also be used for scheduling employees to work on future dates. We do not have mandatory many-to-many relationships for most relationships, because there may be a case where all planes are grounded. But, we will assume that the company will always have at least one operational plane.