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Labouseur Lab 9

Design and document with a fully annotated ER diagram a relational database for NASA using the following data. You may create primary keys for strong entities.

- Engineers: First name, last name, highest academic degree earned, age, favorite video game
- Astronauts: First name, last name, years flying, age, golf handicap, spouse name
- Flight Control Operators: First name, last name, chair preference, age, preferred drink, recommended hangover cure
- Spacecraft: name, tail number, weight in tons, fuel type, crew capacity
- Crew: who (astronauts) flew on what spacecraft
- Systems: name, description, costUSD (a spacecraft has many systems)
- Parts: name, description, costUSD (a system has many parts)
- Suppliers: name, address, payment terms (suppliers supply parts for systems for spacecraft)
- Catalog: who supplies what parts

1. Functional Dependencies
   People
          PID → FirstName, LastName, Age
   Engineers
          PID → HighestDegree, FavVideoGame
   FlightControlOperators
          PID → ChairPref, DrinkPref, HangoverCure
   Astronauts
          PID → YearsFlying, GolfHandicap, Spouse
   Crew
          PID → SCID
   SpaceCraft
          SCID → Name, TailNumber, Weight(Tons), FuleType, CrewCapacity
   Systems
          SystemID → Name, Description, Cost(USD)
   Parts
          PartID → Name, Description, Cost(USD)
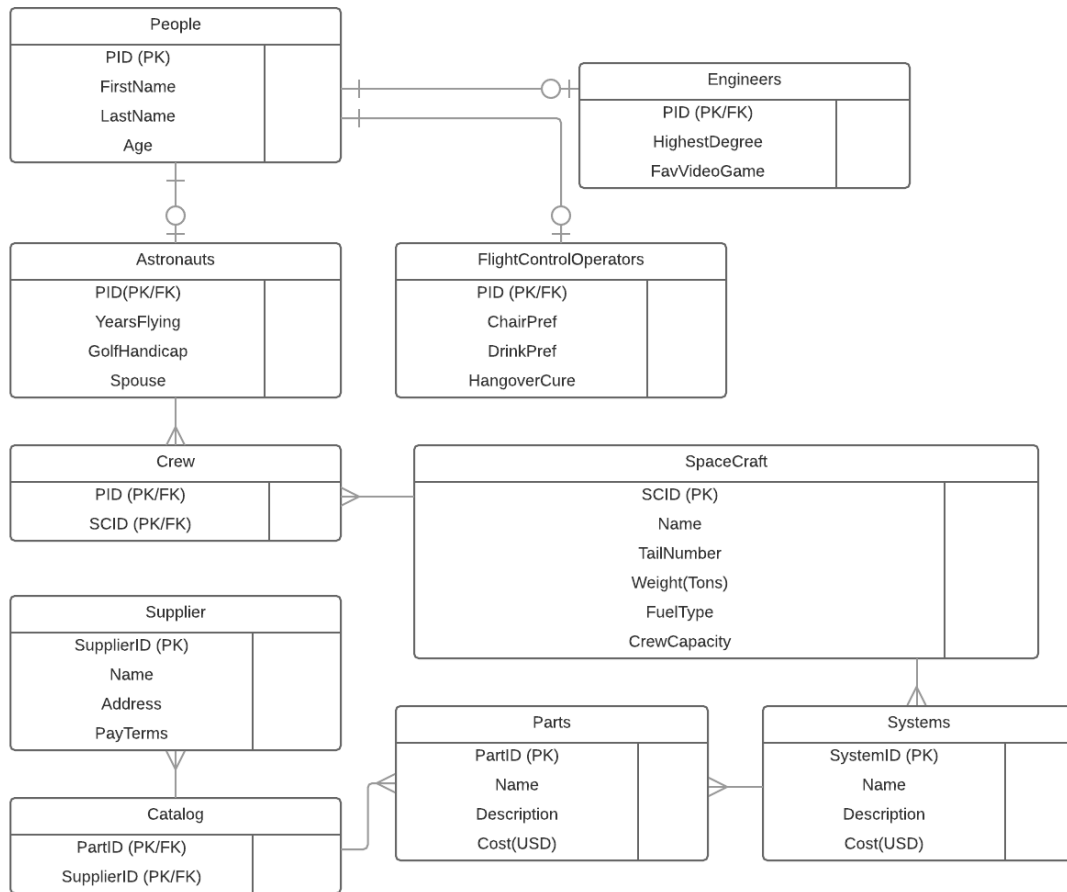   **Catalog**
          PartID → SupplierID
   Supplier
          SupplierID → Name, Address, PayTerms

2. ER Diagram (Hopefully considered to be the platonic ideal)

People

PID (PK)	
FirstName	
LastName	
Age	

Engineers

PID (PK/FK)	
HighestDegree	
FavVideoGame	

Astronauts

PID(PK/FK)	
YearsFlying	
GolfHandicap	
Spouse	

FlightControlOperators

PID (PK/FK)	
ChairPref	
DrinkPref	
HangoverCure	

Crew

| PID (PK/FK) | |
| SCID (PK/FK) | |

SpaceCraft

SCID (PK)	
Name	
TailNumber	
Weight(Tons)	
FuelType	
CrewCapacity	

Supplier

SupplierID (PK)	
Name	
Address	
PayTerms	

Parts

PartID (PK)	
Name	
Description	
Cost(USD)	

Systems

SystemID (PK)	
Name	
Description	
Cost(USD)	

Catalog

| PartID (PK/FK) | |
| SupplierID (PK/FK) | |

3. This database is in first normal forms because all data is atomic, meaning each attribute contains only a single value from the specified domain. It is in second normal form because it is in first normal form and there are no partial key dependencies. This means that no attributes are dependent on subsets of candidate keys within the tables. Lastly, this database is in 3nf because it is in 2nf and there are no multi key dependencies in which a non-key entity is more dependent on another non-key entity than the primary key. Put simply, everything is dependent upon the key, the whole key, and nothing but the key.