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Database Systems

Lab 9: Normalization 3

November 14, 2017

1. Functional Dependencies

People:

PID 🡪 FirstName, LastName, Birthday

Astronauts:

PID 🡪 YearsFlying, GolfHandicap, SpouseID

SpouseID:

SpouseID 🡪 Firstname, LastName

Engineers:

PID 🡪 HighestDegreeEarned, FavoriteVideoGame

Flight Control Operations:

PID 🡪 ChairPreference, PreferredDrink, RecommendedHangoverCure

Crew:

PID, SID 🡪

Spacecraft:

SID 🡪 Craft\_Name, TailNumber, WeightTONS, FuelType, CrewCapacity

Systems for Craft:

SystemsID, SID 🡪

Systems:

SystemsID 🡪 Syst\_Name, Description, CostUSD

System Parts:

PartsID, SystemID

Parts:

PartsID 🡪 Parts\_Name, Description, CostUSD

Category:

PartsID, SuppliersID 🡪

Suppliers:

SuppliersID 🡪 Suppliers\_Name, StreetAddress, State, Zipcode, PaymentTerms

1. NASA ER DIAGRAM
2. In order for this database to be in third normal form or even Boyce-Codd Normal Form, this database must first be in first normal form. It is in first normal form because it is atomic because every cell at every intersection of every row and column cannot be broken down further. For example, in people, FirstName and LastName are broken up because Pearl Amin in one column would be a list and would break first normal form and this holds true for all of the fields in this database. This database is also in second normal form because it is in first normal form and has no partial-key dependencies among the tables. Lastly, this database is in third normal form because there are no multi-key dependencies, and it is in first normal form and second normal form. It is in third normal form because there are associate entities, like SystemParts, to ensure that there are no many to many relationships and accuracy and uniqueness are preserved. It would be argued that this database is also in Boyce-Codd Normal Form because it is in third normal form and there are no transitive dependencies among candidate keys.