

## Strong Entities

Relation:

School(name, budget, deanUID)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

School(deanUID)  $\subseteq$  Faculty(UserID)

Relation:

Building(name, xLeftBottom, yLeftBottom, xRightUpper, yRightUpper)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

none

Relation:

Visitor(UserID, name, purpose)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

none

Relation:

Student(UserID, name, UCIEmailaddress, DeptName, type)

Domain:

type = {undergrad, grad}

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

Student(DeptName)  $\subseteq$  Department(name)

Relation:

Staff(UserID, name, UCIEmailaddress, DeptName, Employmenttype)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

Staff(DeptName)  $\subseteq$  Department(name)

Relation:

Faculty(UserID, name, UCIEmailaddress, DeptName, Researcharea)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

Faculty(DeptName)  $\subseteq$  Department(name)

Relation:

Recycle(BinID, capacity, xLocation, yLocation, Contaminated)

Domain:

Contaminated = {yes, no}

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

none

Relation:

Landfill(BinID, capacity, xLocation, yLocation, Compressionsupport)

Domain:

CompressionSupport = {yes, no}

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

none

Relation:

Compost(BinID, capacity, xLocation, yLocation, compostingtype)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

none

Relation:

LocationSensor(SensorID, Ip Address, UserID, mode, maxRange)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

LocationSensor(UserID)  $\subseteq$  Visitor(UserID)

LocationSensor(UserID)  $\subseteq$  Faculty(UserID)

LocationSensor(UserID)  $\subseteq$  Staff(UserID)

LocationSensor(UserID)  $\subseteq$  Student(UserID)

Relation:

LoadSensor(SensorID, Ip Address, Batterypower, BinID, MeasurementType)

Domain:

none

Not Null Attributes: all non-key attributes besides BinID are not NULL

Inclusion Dependencies:

LoadSensor(BinID)  $\subseteq$  Recycle(BinID)

LoadSensor(BinID)  $\subseteq$  Landfill(BinID)

LoadSensor(BinID)  $\subseteq$  Compost(BinID)

Relation:

ObjectRecoSensor(SensorID, Ip Address, Batterypower, BinID, Quantity)

Domain:

none

Not Null Attributes: all non-key attributes besides BinID are not NULL

Inclusion Dependencies:

ObjectRecoSensor(BinID)  $\subseteq$  Recycle(BinID)

ObjectRecoSensor(BinID)  $\subseteq$  Landfill(BinID)

ObjectRecoSensor(BinID)  $\subseteq$  Compost(BinID)

## Weak Entities

Relation:

Department(deptName, schoolName, Startdate, Phoneno., buildingName, managerUID, chairUID)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

Department(schoolName)  $\subseteq$  School(name)

Department(buildingName)  $\subseteq$  Building(name)

Department(managerUID)  $\subseteq$  Staff(UserID)

Department(chairUID)  $\subseteq$  Faculty(UserID)

Relation:

ObjectRecoObs(oid, SensorID, timestamp, Trashtype)

Domain:

Trashtype = {Recycle, Landfill, Compost}

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

ObjectRecoObs(SensorID)  $\subseteq$  ObjectRecoSensor(SensorID)

Relation:

LoadObs(oid, SensorID, timestamp, weight)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

LoadObs(SensorID)  $\subseteq$  LoadSensor(SensorID)

Relation:

LocationObs(oid, SensorID, timestamp, xLocation, yLocation)

Domain:

none

Not Null Attributes: all non-key attributes are not NULL

Inclusion Dependencies:

LocationObs(SensorID)  $\subseteq$  LocationSensor(SensorID)