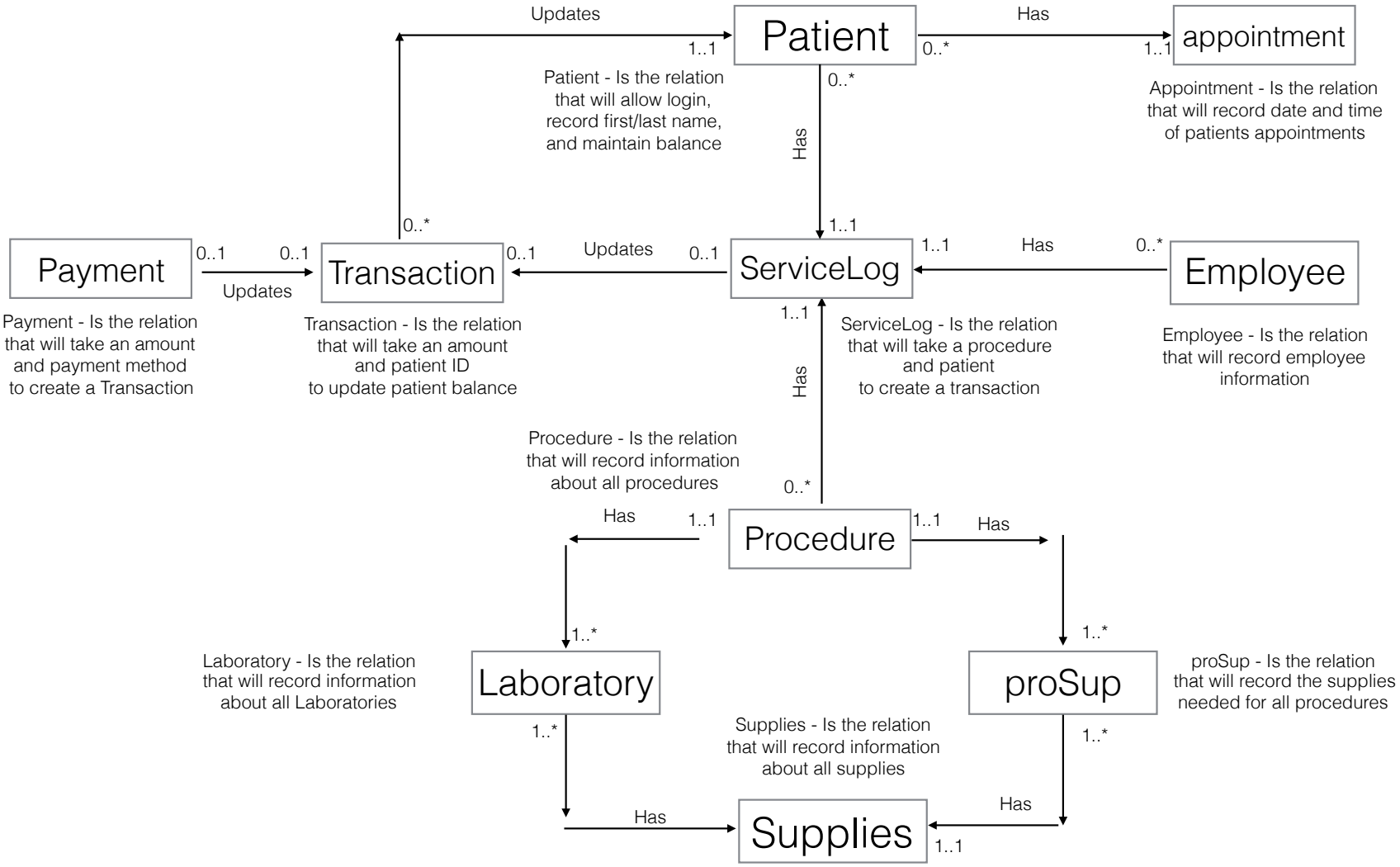
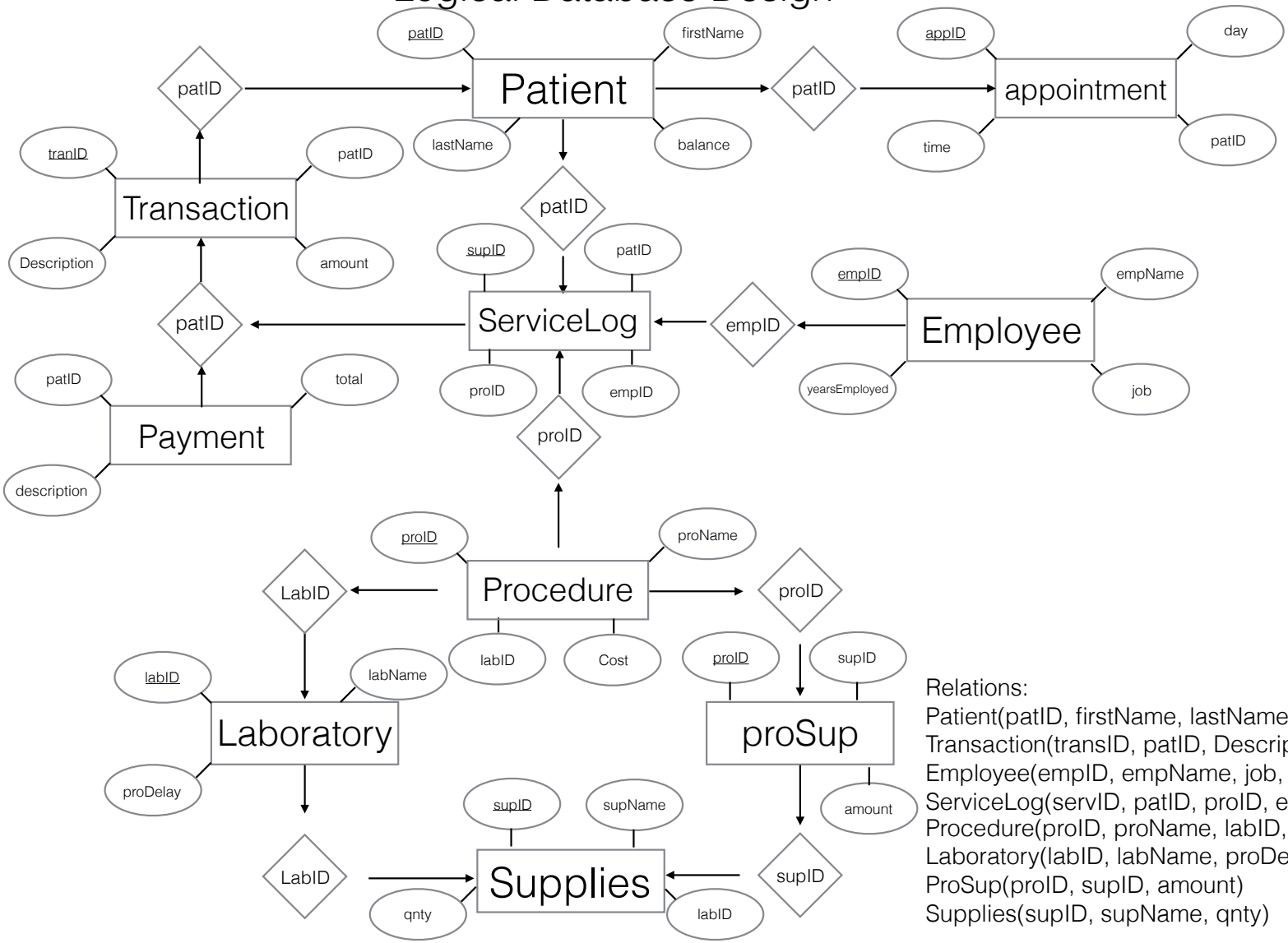
Conceptual Database Design



Logical Database Design



Relations:
Patient(patID, firstName, lastName, balance)
Transaction(transID, patID, Description, amount)
Employee(empID, empName, job, yearsEmployed)
ServiceLog(servID, patID, proID, empID)
Procedure(proID, proName, labID, cost)
Laboratory(labID, labName, proDelay)
ProSup(proID, supID, amount)
Supplies(supID, supName, qnty)

Functional Dependencies

Patient: PatID->(firstName,lastName,balance)
Appointment: appID->(date, time)
Transaction: transID->(date, description, amount)
Employee: empID->(empName,position)
Procedure: proID->(proName, cost, labID)
Laboratory: labID->(labName)
Supplies: supID->(supName, qnty)
proSup: {proID, supID}->(amount)

Our Database is 3NF Because….

For every functional dependency in every relation in our database X->A X is a superkey because only candidate keys functionally determine other attributes and there are no functional dependencies between non-prime attributes

Query Descriptions

Query 1: Patient Registration - INSERT

Takes input of a first and last name from the user and inserts. First, a query is used to see whether a patient with the same name already exists with a select statement matching the first and last names. This is done because unique first and last names are required for login. If there is no previously existing patient with the same name, a new tuple is inserted into the relation.

Query 2: Appointment scheduling - INSERT

Takes input of a time and date from the user and uses a hidden form field to pass the patID to the query. The query first checks if the patient already has an appointment at that time and date using a select statement with each of the conditions. If there is no appointment scheduled, then a new tuple is inserted into the appointment relation.

Query 3: Submitting Service Event - UPDATE

Takes input of a procedure and the employee who performed it and inserts a new tuple into the ServiceLog relation. Triggers in the DBMS then update the balance of the patient in the patient relation.

Query 4: Appointment Cancellation - DELETE

Takes input of a time and date in the same format as insertion from the user. A query using a select statement is used to check that a matching appointment has been scheduled. If so, the matching tuple is then deleted from the appointment relation.

Query 5: View Procedure and Supply Details- QUERY

This query displays the relationship between the procedure and supplies. Using all proIDs (procedure ID), this shows the all information regarding all procedures with their necessary supplies requirements and available quantities.