Montserrat Pagan

CSCI UA.0060 Spring 2025
Assignment 3 – Normalization

1. Happy Supplies Parts Warehouse
   a. Assumptions:
      i. Employees help any and all different customers.
      ii. A cage code is the identifier of the cages (or shelves) that the inventory is stored in.
      iii. A part number is unique, but multiple customers can order the same part. A part name is not necessarily unique.
      iv. Assume a customer can submit multiple orders on the same day, but can not submit multiple orders at the same time.
      v. Assume if a customer has multiple customerType, then they would have a separate customerNumber for each customerType.
      vi. There are multiple cages (cageCode) for the same type of part.
   b.
      i. The data is not in normal form as there are repeating fields since a customer can request multiple parts and the same partNumber in multiple orders at different dates and times. This can be resolved by moving customerNumber and partNumber into separate tables.

customerName customerNumber customerType date time employee partNumber Name Type cageCode quantityOrdered unitPrice

      ii. This is still not in normal form due to repeating fields. The customerNumber (PK) can have multiple order forms on the same day, which would lead to repetition. We can resolve this by separating customerNumber and date.

customerNumber customerName customerType date time employee	partNumber PK name type cageCode unitPrice quantityOrdered

      iii. This is in 1NF because there is a PK on each table with no repeating fields. These tables are also automatically in 2NF since all non-PK fields are dependent on PK fields.

customerNumber PK customerName customerType	date PK time PK employee	partNumber PK name type cageCode quantityOrdered unitPrice

    iv.   The above table is in 3NF because it is in both 1NF and 2NF and there are no fields dependent on non-PK fields. It is important to note that type and cageCode could have been transitive dependencies. Despite this, we are assuming that there might be multiple cages for the same type of part, which would mean that they are only dependent on the partNumber.

c. The below table identifies PK and FK in our 3NF table as well as names the relations.

customer	order	part
customerNumber PK customerName customerType	date PK time PK customerNumber FK employee	partNumber PK type name type cageCode quantityOrdered unitPrice

d. Naming the FK created a bit of confusion when it came to the quantityOrdered field. This field was unique for the part table, but would also need to relate back to the order table. When creating an ERD, it would be recommended to put quantityOrdered into a new table that also bridges attributes from order (date and time PK) and part (partNumber PK).

2. Panacea Mental Health Corporation
    a. Assumptions:
        i. Therapists may work at a number of different branches, but they only see patients at one specific branch on any given day.
        ii. A patient is given an appointment at a specific time and date at a particular branch with one therapist.
        iii. Patients may have multiple appointments in any given day and with multiple different therapists.
    b.
        i. The data shown by the corporation is not in normal form because there are repeating fields like date and time. To change this table to 1NF we would separate staffNo, patientNo, and branchNo in separate tables (seen below).

staffNo PK	patNo PK	branchNo PK
therapistName	patName	appointmentDate PK
		appointmentTime PK

        ii. Now there is a PK for each table and there are no more repeating groups (i.e. branchNo, appointmentDate, appointmentTime combined as PK mean that there is no repetition in appointments).
        iii. The above table is also in 2NF since all non-PK attributes are dependent on the PK. It is also in 3NF since there are no non-PK attributes depending on other non-PK attributes.
    c.

staff	patient	appointment
staffNo PK	patNo PK	branchNo PK
therapistName	patName	appointmentDate PK
		appointmentTime PK
		patNo FK
		staffNo FK

    d. The above table includes 3NF named relations as well as PKs and FKs identified.

3. Maid Better temp agency
   a. Assumptions:
      i.   The Employee Number (eNo) is unique for each member of staff.
      ii. Each contract only applies to one event.
      iii. There may be different contracts for an event depending upon different service needs.
   b. Since there are multiple employees working on the same contract, there is repetition in the table and it is not in 1NF. To resolve this, we can first start by separating the eNo and contractNo into different tables.
      i. Hours are dependent on the employee so they are under the eNo section despite varying hours by event – we can assume that we will eventually create a bridging table that can allow us to see how many hours that each employee worked on each event. There are primary keys and no repetitions so it is now in 1NF. It is also in 2NF since all non-PK keys are dependent on the PK.

eNo PK	contractNo PK
eName	eventNo
hours	eventLoc

   c. Below we have a table in 3NF with PK and FK noted. We have added a bridging table that allows us to accurately see hours worked by employee based on the contract.

employee	employee_contract	contract
eNo PK eName	eNo PK FK contractNo PK FK hours	contractNo PK eventNo eventLoc

   d.