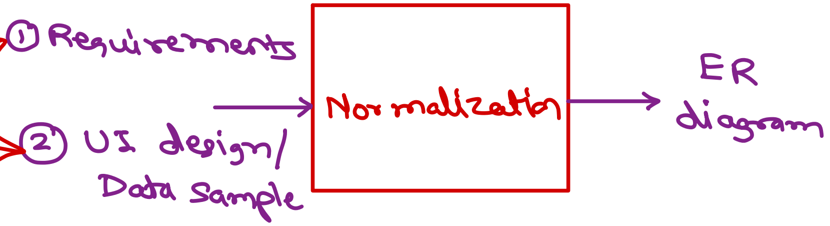
SUNBEAM

MySQL - RDBMS

Trainer: Mr. Nilesh Ghule

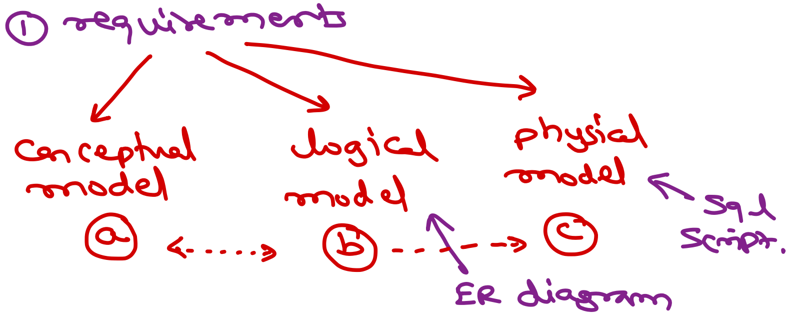
Normalization

- Concept of table design: Table, Structure, Data Types, Width, Constraints, Relations.
- Goals:
  - ✓ Efficient table structure.
  - ✓ Avoid data redundancy i.e. unnecessary duplication of data (to save disk space).
  - ✓ Reduce problems of insert, update & delete.
- Done from input perspective.
- Based on user requirements.



- Part of software design phase.
- View entire appln on per transaction basis & then normalize each transaction separately.

→ process



- Transaction Examples:
  - Banking, Rail Reservation, Online Shopping.

Normalization

- For given transaction make list of all the fields.
- Strive for atomicity. one field = one value
- Get general description of all field properties.
- For all practical purposes we can have a single table with all the columns. Give meaningful names to the table.
- Assign datatypes and widths to all columns on the basis of general desc of fields properties.
- Remove computed columns.
- Assign primary key to the table.
- At this stage data is in un-normalized form.
- UNF is starting point of normalization.

Normalization

- UNF suffers from
  - ✓ Insert anomaly
  - ✓ Update anomaly
  - ✓ Delete anomaly

Normalization

- 1. Remove repeating group into a new table.
- 2. Key elements will be PK of new table.
- 3. (Optional) Add PK of original table to new table to give us Composite PK.
  - Repeat steps 1-3 infinitely -- to remove all repeating groups into new tables.
  - This is **1-NF**. No repeating groups present here. One to Many relationship between two tables.

Normalization

- 4. Only table with composite PK to be examined.
- 5. Those columns that are not dependent on the entire composite PK, they are to be removed into a new table.
- 6. The key elements on which the non-key elements were originally dependent, it is to be added to the new table, and it will be the PK of new table.
    - Repeat steps 4-6 infinitely -- to separate all non-key elements from all tables with composite primary key.
    - This is **2-NF**. Many-to-Many relationship.

Normalization

- 7. Only non-key elements are examined for inter-dependencies.
- 8. Inter-dependent cols that are not directly related to PK, they are to be removed into a new table.
- 9. (a) Key ele will be PK of new table.
- 9. (b) The PK of new table is to be retained in original table for relationship purposes.
  - Repeat steps 7-9 infinitely to examine all non-key eles from all tables and separate them into new table if not dependent on PK.
  - This is **3-NF**.

Normalization

- To ensure data consistency (no wrong data entered by end user).
- Separate table to be created of well-known data. So that min data will be entered by the end user.
- This is BCNF or 4-NF.

Thank you!

Nilesh Ghule <nilesh@sunbeaminfo.com>