Ch 5: More SQL Capabilities

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Agenda

- NULL Logic
- Check constraints
- Triggers
- Views

NULL Logic
...is odd

- NULL values induce and mask many bugs—ALWAYS test for them

- Study Table 5.1 (p. 116 in 6th ed)

- Remember NULL ≠ NULL

- Use IFNULL/NULLIF functions

- Mandatory columns can't have a NULL value

- See this page for detailed discussion: http://dev.mysql.com/doc/refman/5.7/en/problems-with-null.html

Assigning meaning?

- NULL doesn't have any other meaning!
- Don't assume that NULL carries meaning:
  - Phone no.: a NULL in the phone no. field means UNKNOWN
  - It doesn't mean the person has no phone. If you want to capture "this person has/doesn't have a phone" then create an attribute: Has_phone_flag or something similar.
- Test yourself/colleague: am I assuming a meaning when I find a NULL value in a field?

Check Constraints

- To constrain values of the columns within a row
- Example: Date_of_death ≥ Birth_date
- Cannot reference values in another row or another table (use trigger for that)
- Infrequently used—constraint tests are often moved to application layer

Textbook note

- The text references
    - CREATE DOMAIN (Section 4.2.1 on p. 95)
    - CREATE ASSERTION (Section 5.2.1 on p.131)
- MySQL does not support either syntax

Triggers

- A trigger is a set of SQL statements which are performed under certain circumstances.

	INSERT	UPDATE	DELETE
BEFORE			
AFTER			

- A sequence of triggers may be specified, i.e., in creating a trigger you may specify: "PRECEDES TRIGGER_B" or "FOLLOWS TRIGGER_A"

Why Triggers

- To prevent some action taking place that would disrupt the operation of the db and its related applications.

- To perform the calculations for a derived attribute

- To perform other tasks that we'll discuss in physical design.

- Triggers require substantial testing

- Triggers execute at non-zero cost

Views

- A view is a named, persistent virtual table, created by a SELECT statement.

- Views provide a tradeoff
  - A view can replace a long complex SELECT statement (which will save debugging time)
  - A view has nonzero overhead (depends on the db and version)

- There are many constraints on how views can be used. Check your db version documentation for details.

The View "Myth"

- Myth: You can't insert rows into a multi-table view.

- In Oracle one can Insert into a multi-table view (and this feature has been available for over 10 years.) See http://docs.oracle.com/cd/B10500_01/server.920/a96524/c18trigs.htm#10901

- In MySQL (see text section 5.3.3, p137) one cannot. The author makes a global statement, which is no longer true.

Additional Views

- Views are "virtual"—they are "created" each time a query is run against one.

- In some databases there is another variant, called a "Materialized View" or a "Snapshot". These do take up space, and are populated per user parameters.

Some View Vocabulary

- Base Table: The result of a "create table" statement—a concrete db object. Contrast this with a...

- Virtual table: A view is sometimes called a "virtual table" in the text (S 5.3.1).

- Inline view(S 5.3.3): The (temporary) result of a nested query in a Select statement.

Summary

- NULL Logic
- Check constraints
- Triggers
- Views