problem statement

database trigger (all types: row, statement, before and after level)
with a block of code on library table
The system should have track of records that are being updated/deleted. The old values of update/delete records should be added in the library audit table.

Assignment VIII

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- What is trigger ?

A trigger is a set of actions which get executed auto-matically when a specified change operation is performed on a particular table.

Triggers can be defined only on tables, not on views. However triggers on the base table of a view are fired if an insert, update or delete statements is/are issued against a view.

In addition, triggers are commonly used to;

- automatically generated derived columns' values
- prevent invalid transactions
- enforce complex security authorizations
- write to other files for audit trial purpose
- replicate data to different files to achieve data consistency

II parts of trigger

A trigger has basic three parts

I) triggering event or statement

this SQL statement causes a trigger to be fired. A triggering event can be an insert, update, delete statement on a table.

II) trigger restriction

a trigger restriction specifies a boolean (logical) expression that must be true for trigger to be fired. The trigger action is not executed if the trigger restriction evaluates

to false or unknown. Its function is to conclude the execution of a trigger, conditionally.

III) trigger action

A trigger action is the procedure that contains the SQL statements and PL/SQL code to be executed when a triggering statement is issued and the trigger restriction evaluates to TRUE.

// Types of triggers

- row trigger

A row trigger is Fired each time the table is affected by the triggering statement. For example, if an UPDATE statement updates multiple rows of a table, a row trigger is Fired once for each row affe -cted by the update statement.

Row trigger are useful if the code in the trigger action depends on ~~data~~ data provided by the triggering statement or rows that are affected.

- statement trigger

A statement trigger is Fired 'once' on behalf of triggering statement regardless of the number of rows in the table that the triggering statement affects. For example, if a delete statement deletes several rows from a table, a statement level DELETE trigger is Fired only once, regardless of how many

rows are deleted from the table.

Before triggers

before triggers are execute the trigger action before the triggering statement.

Before trigger is used in following situations :

1) when the trigger action should determine whether the triggering statement should be allowed to complete

2) before triggers are used to derive specific column values before completing a triggering insert or update statement.

After triggers

After triggers execute the trigger action after the triggering statement is executed.

These are used in the following situations :

i) after triggers are used when you want the triggering statement to complete before executing the trigger action.

ii) if a before trigger is already present, an after trigger can perform different actions on the same triggering statement.

syntax to create trigger :

create [OR replace] trigger trigger-name {before | after | instead of } { insert | update | delete } [of col-name] ON table-name [reffering OLD as o NEW as n] [for each row] WHEN (condition) DECLARE

declaration-statement BEGIN executable-statements
EXCEPTION exception-handling-statements END;

11 application of trigger :

i) Triggers are used for calling stored procedure

ii) it controls on which update are allowed in a database.

iii) triggers can be used as an alternative method for implementing referential integrity constraints.

iv) when a change happens in a database a trigger can adjust the change to the entire database.

v) using trigger, business rules and transactions are easy to store in database and can be used consis-tently.

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