Assignment A8

Problem Statement:
Database Trigger (All Types: Row level and Statement level triggers, Before and After Triggers).
Write a database trigger on Student table. The System should keep track of the records that are being updated or deleted. The old value of updated or deleted records should be added in Alumni table.
Student (Rollno, Name, DateofAdmission, branch, percent, Status)

Learning Objective:
1. To understand Database trigger and its types.

Learning Outcomes: The student will be able to implement:
1. Implement and apply types of database trigger.

Hardware and software requirements:
PL/SQL, Linux based OS

Theory:
Triggers
A trigger defines an action the database should take when some database-related event (such as inserts, updates, deletes) occurs. Triggers are similar to procedures, in that they are named PL/SQL blocks.

Difference between procedures and triggers
A procedure is executed explicitly from another block via a procedure call with passing arguments, while a trigger is executed (or fired) implicitly whenever the triggering event happens, and a trigger doesn't accept arguments.
Usage of triggers
1. Maintaining complex integrity constraints (referential integrity) or business rules

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2. Auditing information in a table by recording the changes.

3. Automatically signalling other programs that action needs to take place when changes are made to a table

4. Collecting/maintaining statistical data.

Triggers exist in a separate namespace from procedure, package, tables (that share the same namespace), which means that a trigger can have the same name as a table or procedure.

Types of triggers
Row and Statement level triggers
1. Row-level triggers for data related activities

  a. Row-level triggers execute once for each row in a transaction.

  b. Row-level triggers are the most common type of triggers; they are often used in data auditing applications.

  c. Row-level trigger is identified by the For Each Row clause in the Create Trigger command.

2. Statement-level triggers for transactions-related activities

  a. Statement-level triggers execute once for each transaction.

  b. They are normally used to enforce additional security measures on the types of transactions that may be performed on a table.

  c. Statement-level triggers are the default type of triggers created and are identified by omitting the For Each Row clause.

Before and After Triggers
Since triggers occur because of events, they may be set to occur immediately before or after those events. The events that execute triggers are database transactions, triggers can be executed immediately before or after the statements Inserts, Updates or Deletes.

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Syntax:

Create [or Replace] Trigger trigger_name

{ Bfore | After }{ Isert | Update | Delete }[OF column]

ON table_reference

[For Each Row [When condition]]

[Declare];

...procedure...

Conclusion: Thus, we learnt about the different types of triggers in SQL, their implementation and applications. We created triggers of all types.