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Triggers in PL/SQL

TRIGGERS are stored programs that are block of PL/SQL code which oracle engine can execute automatically based on some action or event.

Events can be :-

- DDL statements (CREATE, ALTER, DROP, TRUNCATE).
- DML statements (INSERT, SELECT, UPDATE, DELETE).
- Database operations (LOGON, LOGOFF, SHUTDOWN).

A trigger is stored procedure in database which automatically invokes whenever a special event in the database occurs.

For example, a trigger can be invoked when a row is inserted into a specified table or when certain table columns are being updated.

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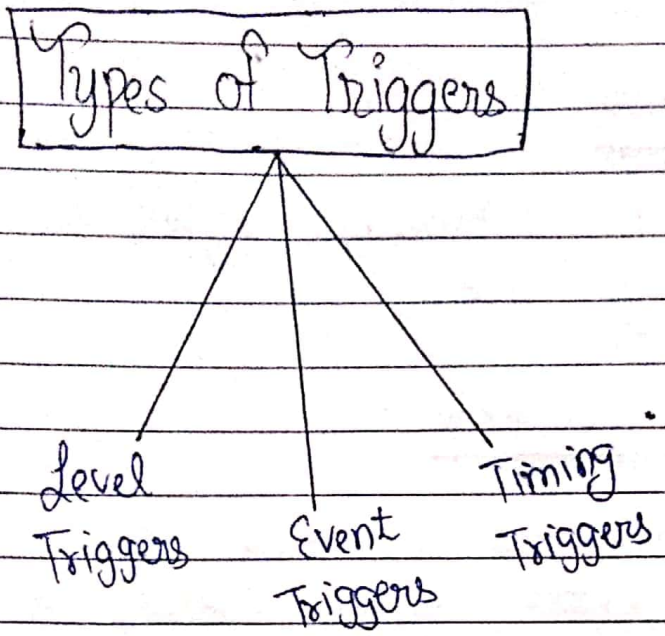
Types of Triggers



① Level Triggers :- There are 2 different types of level triggers, they are:-

(i) Row-Level Trigger :-
It fires for every record that got affected with the execution of DML statements like INSERT, UPDATE, DELETE etc.

It always use a FOR EACH ROW clause in a triggering statement.

(ii) Statement level Triggers :-

It fires once for each statement that is executed.

It is fired once on behalf of the triggering statement.

(2) Event Triggers :-

There are 3 different types of event triggers, they are:

(i) DDL EVENT TRIGGER :-

It fires with the execution of every DDL Statement (CREATE, ALTER, DROP, TRUNCATE.

(ii) DML EVENT TRIGGER :-

It fires with the execution of every DML statement (INSERT, UPDATE, DELETE).

(iii) Database EVENT TRIGGER :-

It fires with the execution of every database oper. which can be LOGON, LOGOFF, SHUTDOWN, SEVERERROR

(3) Timing Triggers

(i) Before Triggers :- It fires before executing DML Statement.

Triggering statement may or may not executing depending upon the before condition block.

(ii) ALTER TRIGGER :- It fires after executing DML statement.

* Syntax for Creating Triggers:-

keyword

```
CREATE OR REPLACE TRIGGER <trigger name>
BEFORE / AFTER / INSTEAD OF   <- specify the timing of trigger
    -> INSERT / DELETE / UPDATE ON <tablename>
REFERENCING (OLD AS O, NEW AS N)
                              <- Specify condition, only for row level trigger
FOR EACH ROW WHEN (test Condition)
                              -> Specify row level trigger
DECLARE
        -- Variable declaration;
BEGIN
        -- Executable statements;
EXCEPTION
        -- Error handling statements;
END <trigger_name>;
END;
```

DML Statement

refer to old and new values

* Example

Tablename : emp

```
select * from emp;
```

EID	ENAME	SALARY
1	Johan	30,000
2	Bob	31000
3	James	42000
4	Jasmine	43000
5	Garima	45000

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```
→ Create or replace trigger salary_difference
→ before insert or delete or update on emp
→ for each row
→ declare
    salary_diff  number;
  begin
    salary_diff  = :new.salary - :old.salary;
    dbms_output.put_line ('oldsalary: ' || :old.salary);
    dbms_output.put_line ('New Salary : ' || :new.salary);
    dbms_output.put_line ('Salary difference: ' ||
                                    salary_diff);
    end ;
    /
```


Output:- Trigger Created

← Query

→ `Insert into emp values (6, 'Rahul', 34000);`

old salary :
New salary : 34000
Salary difference :

Output `1 row created.`

← Query

→ `delete from emp where id = 6;`

Old salary : 34000
New salary :
Salary difference :
1 row deleted

→ Update emp set salary = 35000 where eid = 1

old salary : 30000
New salary : 35000
Salary difference : 500

Output → 1 row updated

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* Dropping a TRIGGER

In drop a Trigger, DROP TRIGGER statement is used to drop a trigger.

Syntax

```
DROP TRIGGER <trigger_name>;
```

Example

```
DROP TRIGGER T1;
```

* Storage for TRIGGERS

Upon first execution, the source code of a trigger is compiled and stored in the database.

→ To obtain information about any trigger, the data dictionary view 'USER_TRIGGERS' is used.

Example

```
Select * from USER_TRIGGERS;
```

Notes by:- jpwebdevelopers.