

**Course :** CSE 2004 – Database Management Systems

**Lab slot :** L55+ L56

**Faculty :** Dr. B Saleena

**Ex. No: 9**

**Date: 20/10/17**

### PL/SQL Triggers

#### Table : StudentAcad with 8 records.

SQL> CREATE TABLE StudentAcad

2 (RegNo number NOT NULL, Name varchar(40) NOT NULL, GPA number NOT NULL, CONSTRAINT RegNo\_pk  
PRIMARY KEY(RegNo));

Table created.

SQL> SELECT \* FROM StudentAcad;

REGNO	NAME	GPA
-----	-----	-----
1091	Aakash Tiwari	8.8
1382	Chahat Agarwal	8.5
1190	Dhruv Garg	9.2
1331	Raagul Nagendran	9.5
1246	Aravind Krishnan	9.3
1199	Vishnu Nagpal	8.8
1156	Rachit Tiwary	9.4
1113	Shantanu Gupta	9.6

8 rows selected.

#### Table : StudentLogs to store update/delete history on table StudentAcad.

SQL> CREATE TABLE StudentLogs

2 (StudentID number NOT NULL, StudentName varchar(50) NOT NULL, Action varchar(15) NOT NULL);

Table created.

**QUESTION 1**

Create an after update trigger when the gpa of a student is updated.

**CODE**

```
SQL> CREATE OR REPLACE

2  TRIGGER STUDENTACAD_UPDATE_AFTER

3  AFTER UPDATE

4  ON StudentAcad

5  FOR EACH ROW

6  DECLARE

7  StudentID number;

8  StudentName varchar(20);

9  Action varchar(20);

10 BEGIN

11 StudentID := :new.RegNo;

12 StudentName := :new.Name;

13 Action := 'After update trigger';

14 dbms_output.put_line('Updated GPA');

15 INSERT INTO StudentLogs VALUES (StudentID, StudentName, Action);

16 END;

17 /
```

Trigger created.

**OUTPUT**

```
SQL> UPDATE StudentAcad SET GPA = 9.5 WHERE RegNo = 1190;
```

*//Updating 1<sup>st</sup> record*

Updated GPA

*// Output from the trigger*

1 row updated.

SQL> SELECT \* FROM StudentLogs;

//Trigger successfully adds a record

Into the table "StuentLogs"

STUDENTID	STUDENTNAME	ACTION
-----	-----	-----
1190	Dhruv Garg	After update trigger

SQL> SELECT \* FROM StudentAcad;

//Updated table "StudentAcad"

REGNO	NAME	GPA
-----	-----	-----
1091	Aakash Tiwari	8.8
1382	Chahat Agarwal	8.5
1190	Dhruv Garg	9.5
1331	Raagul Nagendran	9.5
1246	Aravind Krishnan	9.3
1199	Vishnu Nagpal	8.8
1156	Rachit Tiwary	9.4
1113	Shantanu Gupta	9.6

8 rows selected.

SQL> UPDATE StudentAcad SET GPA = 9.0 WHERE RegNo = 1156;

//Updating 2nd record

Updated GPA

1 row updated.

SQL> SELECT \* FROM StudentLogs;

//Trigger successfully the 2nd record

To table "StudentLogs"

STUDENTID	STUDENTNAME	ACTION
-----	-----	-----
1190	Dhruv Garg	After update trigger
1156	Rachit Tiwary	After update trigger

```
SQL> SELECT * FROM StudentAcad;
```

// Final table "StudentAcad"

After 2 updations

REGNO	NAME	GPA
-----	-----	-----
1091	Aakash Tiwari	8.8
1382	Chahat Agarwal	8.5
1190	Dhruv Garg	9.5
1331	Raagul Nagendran	9.5
1246	Aravind Krishnan	9.3
1199	Vishnu Nagpal	8.8
1156	Rachit Tiwary	9
1113	Shantanu Gupta	9.6

## QUESTION 2

Throw an exception for a before update trigger when a delete statement is executed for the student with regno 101

## CODE

```
SQL> CREATE OR REPLACE
```

```
2 TRIGGER STUDENTACAD_BEFORE_DELETE
```

```
3 BEFORE DELETE
```

```
4 ON StudentAcad
```

```
5 FOR EACH ROW
```

```
6 DECLARE
```

```
7 StudentID number;
```

```
8 StudentName varchar(25);
```

```
9 Action varchar(25);
```

```
10 BEGIN
```

```
11 StudentID := :old.RegNo;
```

```

12 StudentName := :old.Name;

13 Action := 'Before delete trigger';

14 INSERT INTO StudentLogs VALUES (StudentID, StudentName, Action);

15 IF (StudentID = 1190) THEN

16 RAISE_APPLICATION_ERROR(-20000, 'StudentID 1190 cannot be deleted');

17 ELSE

18 dbms_output.put_line('Record deleted');

19 END IF;

20 END;

21 /

```

Trigger created.

## OUTPUT

SQL> DELETE FROM StudentAcad WHERE RegNo = 1331;

*//1st record deleted*

Record deleted

1 row deleted.

SQL> SELECT \* FROM StudentLogs;

*//Table "StudentLogs" updated  
after insertion from the trigger*

STUDENTID	STUDENTNAME	ACTION
-----	-----	-----
1190	Dhruv Garg	After update trigger
1156	Rachit Tiwary	After update trigger
1331	Raagul Nagendran	Before delete trigger

SQL> DELETE FROM StudentAcad WHERE RegNo = 1190;

*//Trigger invokes exception on*

DELETE FROM StudentAcad WHERE RegNo = 1190

*getting StudentID = 1190*

\*

ERROR at line 1:

ORA-20000: StudentID 1190 cannot be deleted

ORA-06512: at "SYSTEM.STUDENTACAD\_BEFORE\_DELETE", line 11

*//No deletion occurs*

ORA-04088: error during execution of trigger 'SYSTEM.STUDENTACAD\_BEFORE\_DELETE'

SQL> SELECT \* FROM StudentLogs;

*//As a result of the exception, no*

STUDENTID	STUDENTNAME	ACTION
-----	-----	-----
1190	Dhruv Garg	After update trigger
1156	Rachit Tiwary	After update trigger
1331	Raagul Nagendran	Before delete trigger

*no record enters "StudentLogs"*

SQL> DELETE FROM StudentAcad WHERE RegNo = 1246;

*//2nd record deleted*

Record deleted

1 row deleted.

SQL> SELECT \* FROM StudentLogs;

*//Table "StudentLogs" is updated*

STUDENTID	STUDENTNAME	ACTION
-----	-----	-----
1190	Dhruv Garg	After update trigger
1156	Rachit Tiwary	After update trigger
1331	Raagul Nagendran	Before delete trigger
1246	Aravind Krishnan	Before delete trigger

*after insertion from the trigger*

```
SQL> SELECT * FROM StudentAcad;
```

*//Final table "StudentAcad" after*

*all insertions and deletions.*

REGNO	NAME	GPA
-----	-----	-----
1091	Aakash Tiwari	8.8
1382	Chahat Agarwal	8.5
1190	Dhruv Garg	9.5
1199	Vishnu Nagpal	8.8
1156	Rachit Tiwary	9
1113	Shantanu Gupta	9.6

6 rows selected.