Aim: Database Trigger (All Types: Row level, before and After Triggers).Write a database

trigger on Library 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 Library\_Audit

table.

Create table library(rollno int, name char(10), dateofissue date, nameofbook char(10),

status char(10));

Create table library\_audit(rollno int, name char(10), dateofissue date, nameofbook

char(10), status char(10), ts timestamp);

Insert into library values (101, 'Ram',to\_date('20170923','YYYYMMDD'),'DBMS', 'I');

Insert into library values (102, 'Sai',to\_date('20170910','YYYYMMDD'),'CN', 'I');

Insert into library values (103, 'Laxman',to\_date('20170928','YYYYMMDD'),'TOC', 'I');

Insert into library values (104, 'Sai',to\_date('20170825','YYYYMMDD'),'SEPM', 'I');

Insert into library values (105, 'Ganesh',to\_date('20170901','YYYYMMDD'),'IEEE', 'I');

Select \* from library;

Select \* from library\_audit;

SQL> select \* from library;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

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101 Ram 23-SEP-17 DBMS I

102 Sai 10-SEP-17 CN I

103 Laxman 28-SEP-17 TOC I

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

SQL> Create table library\_audit(rollno int, name char(10), dateofissue date, nameofbook

char(10), status char(10), ts timestamp);

Table created.

SQL> select \* from library\_audit;

no rows selected

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

AFTER INSERT Trigger – Row Level Trigger

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

CREATE OR REPLACE TRIGGER after\_insert

AFTER INSERT

ON library

FOR EACH ROW

BEGIN

insert into library\_audit values(:new.rollno, :new.name, :new.dateofissue,

:new.nameofbook, :new.status, current\_timestamp);

END;

/

Trigger created.

SQL> select \* from library;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

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101 Ram 23-SEP-17 DBMS I

102 Sai 10-SEP-17 CN I

103 Laxman 28-SEP-17 TOC I

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

SQL> select \* from library\_audit;

no rows selected

SQL> Insert into library values (106, 'Gajanan',to\_date('20171001','YYYYMMDD'),'

DDA', 'I');

1 row created.

SQL> select \* from library;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

---------- ---------- --------- ---------- ----------

101 Ram 23-SEP-17 DBMS I

102 Sai 10-SEP-17 CN I

103 Laxman 28-SEP-17 TOC I

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

106 Gajanan 01-OCT-17 DDA I

6 rows selected.

SQL> select \* from library\_audit;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS TS

----------------------------------------------------------------------------------------------------------------

106 Gajanan 01-OCT-17 DDA I 02-OCT-17 01.07.25.375000 PM

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

AFTER UPDATE Trigger – Row Level Trigger

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

CREATE OR REPLACE TRIGGER after\_update

AFTER UPDATE

ON Library

FOR EACH ROW

BEGIN

insert into library\_audit values(:old.rollno, :old.name, :old.dateofissue,

:old.nameofbook, :old.status, current\_timestamp);

END;

/

Trigger created.

SQL> select \* from library;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

---------- ---------- --------- ---------- ----------

101 Ram 23-SEP-17 DBMS I

102 Sai 10-SEP-17 CN I

103 Laxman 28-SEP-17 TOC I

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

PROF. SAGAR SHINDE 16

106 Gajanan 01-OCT-17 DDA I

6 rows selected.

SQL> select \* from library\_audit;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS TS

------------------------------------------------------------------------------------- ---------- --------

106 Gajanan 01-OCT-17 DDA I 02-OCT-17 01.07.25.375000 PM

SQL> update library set nameofbook ='MongoDB' where library.rollno=101;

1 row updated.

SQL> select \* from library;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

---------- ---------- --------- ---------- ----------

101 Ram 23-SEP-17 MongoDB I

102 Sai 10-SEP-17 CN I

103 Laxman 28-SEP-17 TOC I

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

106 Gajanan 01-OCT-17 DDA I

6 rows selected.

SQL> select \* from library\_audit;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS TS

------------------------------------------------------------------------------------- ---------- --------- ------

-106 Gajanan 01-OCT-17 DDA I 02-OCT-17 01.07.25.375000 PM

101 Ram 23-SEP-17 DBMS I 02-OCT-17 01.58.22.372000 PM

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AFTER DELETE Trigger – Row Level Trigger

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CREATE TRIGGER after\_delete

AFTER DELETE

ON Library

FOR EACH ROW

BEGIN

insert into library\_audit values(:old.rollno, :old.name, :old.dateofissue,

:old.nameofbook, :old.status, current\_timestamp);

END;

/

Trigger created.

SQL> select \* from library;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

---------- ---------- --------- ---------- ----------

101 Ram 23-SEP-17 MongoDB I

102 Sai 10-SEP-17 CN I

103 Laxman 28-SEP-17 TOC I

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

PROF. SAGAR SHINDE 17

106 Gajanan 01-OCT-17 DDA I

6 rows selected.

SQL> select \* from library\_audit;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS TS

------------------------------------------------------------------------------------- ---------- --------- ------

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106 Gajanan 01-OCT-17 DDA I 02-OCT-17 01.07.25.375000 PM

101 Ram 23-SEP-17 MongoDB I 02-OCT-17 01.58.22.372000 PM

SQL> delete from library where rollno=102;

1 row deleted.

SQL> select \* from library;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

---------- ---------- --------- ---------- ----------

101 Ram 23-SEP-17 MongoDB I

103 Laxman 28-SEP-17 TOC I

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

106 Gajanan 01-OCT-17 DDA I

SQL> select \* from library\_audit;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS TS

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102 Sai 10-SEP-17 CN I 02-OCT-17 02.15.24.618000 PM

106 Gajanan 01-OCT-17 DDA I 02-OCT-17 01.07.25.375000 PM

101 Ram 23-SEP-17 MongoDB I 02-OCT-17 01.58.22.372000 PM

SQL>

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

AFTER Trigger – Row Level Trigger (INSERT/UPDATE/DELETE)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Create table lib(rollno int, name char(10), dateofissue date, nameofbook char(10), status

char(10));

Create table lib\_audit(rollno int, name char(10), dateofissue date, nameofbook char(10),

status char(10), ts timestamp,command varchar2(10));

Insert into lib values (101, 'Ram',to\_date('20170923','YYYYMMDD'),'DBMS', 'I');

Insert into lib values (102, 'Sai',to\_date('20170910','YYYYMMDD'),'CN', 'I');

Insert into lib values (103, 'Laxman',to\_date('20170928','YYYYMMDD'),'TOC', 'I');

Insert into lib values (104, 'Sai',to\_date('20170825','YYYYMMDD'),'SEPM', 'I');

Insert into lib values (105, 'Ganesh',to\_date('20170901','YYYYMMDD'),'IEEE', 'I');

Select \* from lib;

Select \* from lib\_audit;

==================================================================

CREATE OR REPLACE TRIGGER AT1

AFTER INSERT OR DELETE OR UPDATE

PROF. SAGAR SHINDE 18

ON lib

FOR EACH ROW

BEGIN

IF UPDATING THEN

insert into lib\_audit values(:old.rollno, :old.name, :old.dateofissue,

:old.nameofbook, :old.status, current\_timestamp, ' UPDATE');

ELSIF INSERTING THEN

insert into lib\_audit values(:new.rollno, :new.name, :new.dateofissue,

:new.nameofbook, :new.status, current\_timestamp,'INSERT');

ELSIF DELETING THEN

insert into lib\_audit values(:old.rollno, :old.name, :old.dateofissue,

:old.nameofbook, :old.status, current\_timestamp, 'DELETE');

END IF;

END;

/

Trigger created.

==================================================================

\*\*\*\*\* OUTPUT \*\*\*\*\*

\*\*\*\*\*Insert Operation\*\*\*\*\*

SQL> Insert into lib values(106,'Gajanan',to\_date('20171001','YYYYMMDD'),'DDA','I');

1 row created.

SQL> select \* from lib;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

---------- ---------- --------- ---------- ----------

101 Ram 23-SEP-17 DBMS I

102 Sai 10-SEP-17 CN I

103 Laxman 28-SEP-17 TOC I

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

106 Gajanan 01-OCT-17 DDA I

6 rows selected.

SQL> select \* from lib\_audit;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS TS COMMAND

---------- ---------- --------- ---------- ----------------------------------------------------------------------

106 Gajanan 01-OCT-17 DDA I 02-OCT-17 11.12.03.791000 PM INSERT

SQL>

==================================================================

\*\*\*\*\*Update Operation\*\*\*\*\*

SQL> update lib set nameofbook ='MongoDB' where lib.rollno=101;

1 row updated.

SQL> select \* from lib;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

---------- ---------- --------- ---------- ----------

101 Ram 23-SEP-17 MongoDB I

102 Sai 10-SEP-17 CN I

103 Laxman 28-SEP-17 TOC I

PROF. SAGAR SHINDE 19

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

106 Gajanan 01-OCT-17 DDA I

6 rows selected.

SQL> select \* from lib\_audit;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS TS COMMAND

---------- ---------- --------- ---------- ----------------------------------------------------------------------

106 Gajanan 01-OCT-17 DDA I 02-OCT-17 11.12.03.791000 PM INSERT

101 Ram 23-SEP-17 DBMS I 02-OCT-17 11.14.21.436000 PM UPDATE

==================================================================

\*\*\*\*\*Delete Operation\*\*\*\*\*

SQL> delete from lib where rollno=102;

1 row deleted.

SQL>

SQL> select \* from lib\_audit;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS TS COMMAND

---------- ---------- --------- ---------- ----------------------------------------------------------------------

106 Gajanan 01-OCT-17 DDA I 02-OCT-17 11.12.03.791000 PM INSERT

101 Ram 23-SEP-17 MongoDB I 02-OCT-17 11.14.21.436000 PM UPDATE

102 Sai 10-SEP-17 CN I 02-OCT-17 11.16.03.851000 PM DELETE

SQL> select \* from lib;

ROLLNO NAME DATEOFISS NAMEOFBOOK STATUS

---------- ---------- --------- ---------- ----------

101 Ram 23-SEP-17 MongoDB I

103 Laxman 28-SEP-17 TOC I

104 Sai 25-AUG-17 SEPM I

105 Ganesh 01-SEP-17 IEEE I

106 Gajanan 01-OCT-17 DDA I

SQL>

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