

Introduction To Databases

Lab Practice #6 – Trigger – Solution

Exercise 1

Tables before trigger execution

IMP

EMPNO	DEPTNO	ENAME	JOB	SAL
7000	10	SMITH	CLERK	850
7010	10	SCOTT	ANALYST	1000
7020	10	BLAKE	SALESMAN	1400
7030	10	SMITH	MANAGER	2500
7040	20	SMITH	CLERK	800
7050	20	SCOTT	ANALYST	1600
7060	30	ADAMS	CLERK	900
7070	30	JAMES	CLERK	1000
7080	40	ALLEN	CLERK	850

DIP

DEPTNO	DNAME	LOC	MINSAL	MAXSAL
10	ACCOUNTING	NEW YORK	100	2500
20	RESEARCH	DALLAS	150	3000
30	SALES	CHICAGO	120	2500
40	OPERATIONS	BOSTON	200	2100

Trigger

```
CREATE OR REPLACE TRIGGER UP_SAL
AFTER UPDATE OF DNAME ON DIP
FOR EACH ROW
WHEN (OLD.DNAME='ACCOUNTING' AND NEW.DNAME='SALES')
BEGIN
--- updating salary of the employees of the changed department
UPDATE IMP
SET SAL=SAL+100
WHERE DEPTNO = :OLD.DEPTNO;
END;
```

Update statement

```
UPDATE DIP SET DNAME = 'SALES' WHERE DNAME='ACCOUNTING';
```

Tables after trigger execution

IMP

DEPTNO	DNAME	LOC	MINSAL	MAXSAL
10	SALES	NEW YORK	100	2500
20	RESEARCH	DALLAS	150	3000
30	SALES	CHICAGO	120	2500
40	OPERATIONS	BOSTON	200	2100

DIP

EMPNO	DEPTNO	ENAME	JOB	SAL
7000	10	SMITH	CLERK	950
7010	10	SCOTT	ANALYST	1700
7020	10	BLAKE	SALESMAN	1500
7030	10	SMITH	MANAGER	2600
7040	20	SMITH	CLERK	800
7050	20	SCOTT	ANALYST	1600
7060	30	ADAMS	CLERK	000
7070	30	JAMES	CLERK	1000
7080	40	ALLEN	CLERK	850

Exercise 2

Tables before trigger execution

IMP

EMPNO	ENAME	JOB	SAL
1	VERDI	SEGRETERIA	800
2	ROSSI	BANCHIERE	900
3	BIANCHI	BANCHIERE	1100

SUMMARY

JOB	NUM
SEGRETERIA	1
BANCHIERE	2

Trigger to manage the insertion of a new record into the IMP table

```
CREATE OR REPLACE TRIGGER INS_IMP
AFTER INSERT ON IMP
FOR EACH ROW
DECLARE
N NUMBER;
M NUMBER;
BEGIN
--- checking if there are other employees with the same job
SELECT COUNT(*) INTO N
FROM SUMMARY
WHERE JOB=:NEW.JOB;
IF(N=0) THEN
--- this is the first employee with this job
INSERT INTO SUMMARY (JOB, NUM)
VALUES(:NEW.JOB, 1);
ELSE
--- there is at least another employee with the same job
SELECT NUM INTO M
FROM SUMMARY
WHERE JOB=:NEW.JOB;
UPDATE SUMMARY
SET NUM=M+1
WHERE JOB=:NEW.JOB;
END IF;
END;
```

Insert statement

```
INSERT INTO IMP(EMPNO, ENAME, JOB, SAL) VALUES(4, 'NERI', 'CORRIERE', 750);
```

Tables after trigger execution

IMP

EMPNO	ENAME	JOB	SAL
1	VERDI	SEGRETARIA	800
2	ROSSI	BANCHIERE	900
3	BIANCHI	BANCHIERE	1100
4	NERI	CORRIERE	750

SUMMARY

JOB	NUM
SEGRETARIA	1
BANCHIERE	2
CORRIERE	1

Trigger to manage the update of the JOB field on the IMP table

```
CREATE OR REPLACE TRIGGER UPD_IMP
AFTER UPDATE OF JOB ON IMP
FOR EACH ROW
DECLARE
N NUMBER;
M NUMBER;
BEGIN
--- conta quanti impiegati hanno il nuovo lavoro
SELECT COUNT(*) INTO N
FROM SUMMARY
WHERE JOB=:NEW.JOB;
---incrementa il numero di impiegati per il nuovo lavoro
IF (N=0) THEN
---l'impiegato inserito è il primo impiegato per il nuovo lavoro
INSERT INTO SUMMARY(JOB, NUM)
VALUES(:NEW.JOB, 1);
ELSE
---c'è almeno un altro impiegato per il nuovo lavoro
UPDATE SUMMARY
SET NUM = NUM +1
WHERE JOB = :NEW.JOB;
END IF;
SELECT NUM INTO M
FROM SUMMARY
WHERE JOB = :OLD.JOB;
IF (M=1) THEN
---c'era un solo impiegato per il vecchio lavoro. Cancella il record dalla tabella SUMMARY
DELETE FROM SUMMARY
WHERE JOB = :OLD.JOB;
ELSE
---decrementa NUM nel corrisponente record nella tabella SUMMARY
UPDATE SUMMARY
SET NUM = NUM -1
WHERE JOB = :OLD.JOB;
END IF;
END;
```

Update statement

```
UPDATE IMP SET JOB='CORRIERE' WHERE EMPNO=2;
```

Tables after trigger execution

IMP

EMPNO	ENAME	JOB	SAL
1	VERDI	SEGRETERIA	800
2	ROSSI	CORRIERE	900
3	BIANCHI	BANCHIERE	1100
4	NERI	CORRIERE	750

SUMMARY

JOB	NUM
SEGRETERIA	1
BANCHIERE	1
CORRIERE	2