

Tutorial 8 (Solution)

SQL

Classroom Exercise

Question 1

(i)

```
UPDATE employee
SET    city = 'Newtown' AND street = 'Newstreet'
WHERE  person-name = 'Mark';
```

(ii)

```
UPDATE works
SET    salary = salary*1.1
WHERE  company-name = 'FaceMatch';
```

(iii)

```
UPDATE works
SET    salary = salary*1.1
WHERE  person-name IN (SELECT manager-name
                        FROM   manages)
AND    company-name = 'FaceMatch';
```

Question 2

(i)

Allowed. Insert ('X', 123, 'CMSC', null) into student. This will be disallowed if "gpa" is not allowed to be null however.

(ii)

Not allowed. It is not clear how to change the base tuples in response to a change in the average.

Question 3

(i)

```
CREATE ASSERTION NoRedAndGreenParts CHECK
(NOT EXISTS
(
  (SELECT      C.sid
    FROM Catalog C, Parts P
    WHERE      C.pid = P.pid AND P.color = "red")
  INTERSECTS
  (SELECT      C.sid
    FROM Catalog C, Parts P
    WHERE      C.pid = P.pid AND P.color = "green")
)
);
```

(ii)

```
CREATE ASSERTION NoLowerPriceThanSid1 CHECK
(NOT EXISTS
( SELECT      *
  FROM        Catalog C1, Catalog C2
  WHERE       C1pid = C2.pid AND
              C2.sid = 1 AND
              C1.price < C2.price
)
);
```

Question 4

The following two triggers are needed. Note the difference between the two.

```
CREATE TRIGGER fd_enforcer_update
BEFORE UPDATE on R
FOR EACH ROW
DECLARE counter INT
BEGIN
  SELECT COUNT(*) INTO counter
  FROM R
  WHERE R.A = NEW.A AND R.B = NEW.B AND R.C <> NEW.C AND
        NOT (R.A = OLD.A AND R.B = OLD.B AND R.C = OLD.C
              AND R.D = OLD.D AND R.E = OLD.E);
  IF (counter > 0)
    THEN raise_exception('AB->C on R was violated');
END;
```

```

CREATE TRIGGER fd_enforcer_insert
BEFORE INSERT on R
FOR EACH ROW
DECLARE counter INT
BEGIN
    SELECT COUNT(*) INTO counter
    FROM R
    WHERE R.A = NEW.A AND R.B = NEW.B AND R.C <> NEW.C;
IF (counter > 0 )
    THEN raise_exception('AB->C on R was violated');
END;

```

Question 5

```

CREATE TRIGGER SetPriceOfRemainingSeats
AFTER INSERT ON Booking
REFERENCING NEW ROW AS new FOR
EACH ROW
WHEN
    ( ( ( SELECT COUNT( BREF)
          FROM Booking
          WHERE flightNo = new.flightNo
          AND day = new.day
          AND month = new.month
          AND year = new.year ) -
      ( SELECT numSeats
        FROM Flight
        WHERE flightNo = new.flightNo
        AND day = new.day
        AND month = new.month
        AND year = new.year ) ) > -20
    )
BEGIN
    UPDATE Flight
    SET price = 4000
    WHERE flightNo = new.flightNo
    AND day = new.day
    AND month = new.month
    AND year = new.year;
END;

```

Question 6

```
CREATE TRIGGER FixClash
BEFORE INSERT ON registeredFor
REFERENCING NEW ROW AS new
FOR EACH ROW
DECLARE et CHAR(2)
WHEN ( EXISTS (
    SELECT E1.course
    FROM (registeredFor NATURAL JOIN Exams) E1, Exams E2
    WHERE student = new.student
        AND E2.course = new.course
        AND E1.examDate = new.examDate
        AND E1.course <> E2.course
        AND E1.examDate = E2.examDate
        AND E1.examTime = E2.examTime
    ) )
BEGIN
    SELECT examTime INTO et
    FROM Exams
    WHERE course = new.course AND examDate = new.examDate;

    IF (et = 'AM') THEN
        INSERT INTO SpecialExams
        VALUES(new.student, new.course, new.examDate, 'PM');
    ELSE
        INSERT INTO SpecialExams
        VALUES(new.student, new.course, new.examDate, 'AM');
    END IF;
END;
```