Imamshah, Nicholas
CIS 4301
Assignment 4

Task 1

Trigger:

```
CREATE OR REPLACE TRIGGER task1_insert_sighting
BEFORE INSERT ON SIGHTINGS
FOR EACH ROW
DECLARE
  counter number;
BEGIN
  SELECT COUNT(location)
  INTO counter
  FROM features
  WHERE location = :NEW.location;

  IF counter = 0 THEN
    INSERT INTO features VALUES (:NEW.location, 'UNKNOWN', NULL, NULL, NULL, NULL);
    dbms_output.put_line('Warning: Insert into the SIGHTINGS table references
location ' ||''''|| :NEW.location ||''''|| ' that is not found in the database');
  END IF;
END;
```

Output:

```
1 row inserted.
1 row inserted.
1 row inserted.
1 row inserted.
1 row inserted.

NAME                           PERSON
------------------------------ ------------------------------
LOCATION                       SIGHTED
------------------------------ ---------
Douglas dustymaiden            Person B
Double Mountain                28-NOV-05

Douglas dustymaiden            Person A
Shirley Peak                   18-AUG-06

Douglas dustymaiden            Person B
Grouse Meadow                  28-NOV-06

NAME                           PERSON
------------------------------ ------------------------------
LOCATION                       SIGHTED
------------------------------ ---------
Douglas dustymaiden            Person C
Grouse Meadow                  16-AUG-06

Douglas dustymaiden            Person A
Piute                          17-FEB-07
```

```
LOCATION                       CLASS                           LATITUDE
------------------------------ ------------------------------ ----------
 LONGITUDE MAP                                  ELEV
---------- ------------------------------ ----------
Piute                          UNKNOWN
```

DBMS Output:

```
Warning: Insert into the SIGHTINGS table references location 'Piute' that is not
found in the database
```

Task 2

Trigger:

```
CREATE OR REPLACE TRIGGER task2_insert_sighting
BEFORE INSERT ON sightings
FOR EACH ROW
DECLARE
  comname_cnt number;
  genus_cnt number;
  species_cnt number;
  newGen flowers.genus%TYPE;
  newSpec flowers.species%TYPE;
  newCName flowers.comname%TYPE;
BEGIN
  SELECT COUNT(comname)
  INTO comname_cnt
  FROM flowers
  WHERE comname = :NEW.name;

  IF comname_cnt = 0 THEN
    newGen := SUBSTR(:NEW.name, 1, INSTR(:NEW.name, ' ')-1);
    newSpec := SUBSTR(:NEW.name, INSTR(:NEW.name, ' ')+1);

    SELECT COUNT(genus)
    INTO genus_cnt
    FROM flowers
    WHERE genus = newGen;

    SELECT COUNT(species)
    INTO species_cnt
    FROM flowers
    WHERE species = newSpec;

    IF genus_cnt > 0 AND species_cnt > 0 THEN
      BEGIN
        SELECT comname
        INTO newCName
        FROM flowers
        WHERE genus = newGen AND
              species = newSpec;
      END;
      dbms_output.put_line('Your insert into the SIGHTINGS table seemed to use the
Latin name ' ||''''|| :NEW.name ||''''|| ' for the flower ' ||''''|| newCName
||''''|| '. I used the common name instead.');
      :NEW.name := newCName;
    END IF;
  END IF;
END;
```

Output:

```
Error starting at line : 1 in command -
INSERT
INTO SIGHTINGS
VALUES ('Sky pilot', 'Person X', 'Grouse Meadow', TO_DATE('18-Aug-06', 'DD-MON-YY'))
Error report -
SQL Error: ORA-02291: integrity constraint (SYSTEM.FK1_SIGHTINGS) violated - parent
key not found
02291. 00000 - "integrity constraint (%s.%s) violated - parent key not found"
*Cause:    A foreign key value has no matching primary key value.
*Action:   Delete the foreign key or add a matching primary key.

Error starting at line : 5 in command -
INSERT
INTO SIGHTINGS
VALUES ('Hoar buckwheat', 'Person X', 'Grouse Meadow', TO_DATE('18-Aug-06', 'DD-MON-
YY'))
Error report -
SQL Error: ORA-02291: integrity constraint (SYSTEM.FK1_SIGHTINGS) violated - parent
key not found
02291. 00000 - "integrity constraint (%s.%s) violated - parent key not found"
*Cause:    A foreign key value has no matching primary key value.
*Action:   Delete the foreign key or add a matching primary key.

1 row inserted.
1 row inserted.
1 row inserted.

NAME                           PERSON
------------------------------ ------------------------------
LOCATION                       SIGHTED
------------------------------ ---------
Death camas                    Person X
Grouse Meadow                  18-AUG-06

Mud sedge                      Person Y
Grouse Meadow                  18-AUG-06

Draperia                       Person Z
Grouse Meadow                  18-AUG-06
```

DBMS Output:

```
Your insert into the SIGHTINGS table seemed to use the Latin name 'Zigadenus
venenosus' for the flower 'Death camas'. I used the common name instead.

Your insert into the SIGHTINGS table seemed to use the Latin name 'Carex limosa' for
the flower 'Mud sedge'. I used the common name instead.
```

Task 3

Trigger:

```
CREATE OR REPLACE TRIGGER task1_insert_sighting
BEFORE INSERT ON SIGHTINGS
FOR EACH ROW
DECLARE
  counter number;
  SpCh_loc features.location%TYPE;
BEGIN
  SELECT location
  INTO SpCh_loc
  FROM features
  GROUP BY location
  HAVING UTL_MATCH.EDIT_DISTANCE(location, :NEW.location) =
    (SELECT MIN(UTL_MATCH.EDIT_DISTANCE(location, :NEW.location)) AS minDist
    FROM features) AND
    UTL_MATCH.EDIT_DISTANCE(location, :NEW.location) <= 2;

  SELECT COUNT(location)
  INTO counter
  FROM features
  WHERE location = SpCh_loc;

  IF counter = 0 THEN
    INSERT INTO features VALUES (SpCh_loc, 'UNKNOWN', NULL, NULL, NULL, NULL);
    dbms_output.put_line('Warning: Insert into the SIGHTINGS table references
location ' ||''''|| :NEW.location ||''''|| ' that is not found in the database');
  ELSE
    :NEW.location := SpCh_loc;
  END IF;
END;
```

Output:

```
1 row inserted.
1 row inserted.

Error starting at line : 9 in command -
INSERT
INTO SIGHTINGS
VALUES ('Red mountain heather', 'Joe', 'Borwn Paek', TO_DATE('18-Aug-06', 'DD-MON-
YY'))
Error report -
SQL Error: ORA-01403: no data found
```

```
ORA-06512: at "SYSTEM.TASK1_INSERT_SIGHTING", line 5
ORA-04088: error during execution of trigger 'SYSTEM.TASK1_INSERT_SIGHTING'
01403. 00000 -  "no data found"
*Cause:    No data was found from the objects.
*Action:   There was no data from the objects which may be due to end of fetch.

1 row inserted.
1 row inserted.

Error starting at line : 21 in command -
INSERT
INTO SIGHTINGS
VALUES ('Oak violet', 'Joe', 'Scodi Mountians', TO_DATE('18-Aug-06', 'DD-MON-YY'))
Error report -
SQL Error: ORA-01403: no data found
ORA-06512: at "SYSTEM.TASK1_INSERT_SIGHTING", line 5
ORA-04088: error during execution of trigger 'SYSTEM.TASK1_INSERT_SIGHTING'
01403. 00000 -  "no data found"
*Cause:    No data was found from the objects.
*Action:   There was no data from the objects which may be due to end of fetch.

1 row inserted.
1 row inserted.

NAME                           PERSON
------------------------------ ------------------------------
LOCATION                       SIGHTED
------------------------------ ---------
Leopard lily                   Joe
Frog Meadows Campground        18-AUG-06

Alpine sheep sorrel            Joe
Lone Star Mine                 18-AUG-06

Globe gilia                    Joe
The George Lodge               18-AUG-06

NAME                           PERSON
------------------------------ ------------------------------
LOCATION                       SIGHTED
------------------------------ ---------
Ithuriels spear                Joe
San Emigdio Mountains          18-AUG-06

Diamond clarkia                Joe
Camp Alto Campground           18-AUG-06

Broad-seeded rock-cress        Joe
Brush Mountain                 18-AUG-06

 6 rows selected
```

DBMS Output:

Task 4

Package:

```
CREATE OR REPLACE PACKAGE Domination AS -- spec
  PROCEDURE GetThem (input_person VARCHAR2, percentage NUMBER);
END Domination;
/

CREATE OR REPLACE PACKAGE BODY Domination AS -- body
  PROCEDURE GetThem (input_person VARCHAR2, percentage NUMBER) AS
  CURSOR people_cur IS
    SELECT DISTINCT person
    FROM sightings;

  people_t people_cur%ROWTYPE;
  TYPE people_ntt IS TABLE OF people_t%TYPE;
  l_people people_ntt;

  matches NUMBER;
  individ NUMBER;

  BEGIN
    OPEN people_cur;
    FETCH people_cur BULK COLLECT INTO l_people;
    CLOSE people_cur;

    dbms_output.put_line('These people are ' || percentage*100 || '% dominated by '
|| input_person || ':');
    FOR i IN 1..l_people.COUNT LOOP
      --dbms_output.put_line('Current person: ' || l_people(i).person);

      -- Count flowers in common for input_person and other people
      SELECT COUNT(name)
      INTO matches
      FROM
        (SELECT DISTINCT sightings.name, sightings.person
        FROM sightings
        INNER JOIN
          (SELECT name
          FROM sightings
          WHERE person = input_person) curr_person_sightings
        ON sightings.name = curr_person_sightings.name)
      WHERE person = l_people(i).person;
      --dbms_output.put_line('Matches: ' || matches);

      SELECT COUNT(name)
      INTO individ
      FROM
        (SELECT DISTINCT name, person
        FROM sightings)
      WHERE person = l_people(i).person;
      --dbms_output.put_line('Individual: ' || individ);

      IF matches/individ >= percentage THEN
        dbms_output.put_line(l_people(i).person);
      END IF;

    END LOOP;

  END;
END Domination;
/
```

Output:

```
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
```

DBMS Output:

```
These people are 30% dominated by Brad:
Brad
Tim
Pete

These people are 95% dominated by Brad:
Brad

These people are 95% dominated by Donna:
Donna

These people are 95% dominated by Sandra:
Sandra
Brad

These people are 95% dominated by Jennifer:
Michael
Robert
Joe
Helen
John
Brad
```

```
Jennifer
Donna
James
Tim
Pete

These people are 99% dominated by Michael:
Michael
Brad
Tim
Pete

These people are 50% dominated by Sandra:
Sandra
John
Brad
James
Tim
Pete

These people are 50% dominated by Jennifer:
Michael
Sandra
Robert
Joe
Maria
Helen
John
Brad
Jennifer
Donna
James
Tim
Pete
```