

## CSC 355 Database Systems 602

### Assignment 6 (5/21)

**Due 6:00:00pm, Monday 6/1.**

**Reading:** The posted Lecture 14-16 Slides, Sections 7.1-7.5 of Ullman/Widom, and the posted PL/SQL Examples (Lecture 15) and Trigger Examples (Lecture 16). If you want an additional PL/SQL reference, I recommend Chapters 1 through 6 of Oracle's PL/SQL User's Guide and Reference (link posted on course web site). For next week: Sections 8.1-8.2 and 8.5 of Ullman/Widom.

Your task in this assignment is to write an anonymous PL/SQL procedure to query a database and perform some computations using the results. The assignment will ask you to submit a single .sql file containing just your anonymous PL/SQL procedure and some comments.

Consider the table STUDENT with attributes SID, SName, SHW, SMid, SFin, and SQuiz, and the table WEIGHTS with attributes HWWeight, MidWeight, FinWeight, and QuizWeight, created using the following script:

```
DROP TABLE STUDENT CASCADE CONSTRAINTS;
CREATE TABLE STUDENT
(
    SID          CHAR(7)          PRIMARY KEY,
    SName        CHAR(10),
    SHW          NUMBER(5,2)      CHECK (0 <= SHW AND SHW <= 100),
    SMid         NUMBER(3,0)      CHECK (0 <= SMid AND SMid <= 100),
    SFin         NUMBER(3,0)      CHECK (0 <= SFin AND SFin <= 100),
    SQuiz        NUMBER(3,0)      CHECK (0 <= SQuiz AND SQuiz <= 100)
);
INSERT INTO STUDENT VALUES ('1234567', 'Batson', 89, 78, 93, 90);
INSERT INTO STUDENT VALUES ('2233444', 'Bromfield', 96, 88, 91, 100);
INSERT INTO STUDENT VALUES ('3933881', 'Freeman', 75, 52, 70, 80);
INSERT INTO STUDENT VALUES ('4901244', 'Choi', 80, 88, 87, 90);
INSERT INTO STUDENT VALUES ('5811621', 'Pena', 98, 95, 90, 100);
INSERT INTO STUDENT VALUES ('6890016', 'Dudley', 82, 69, 77, 100);
INSERT INTO STUDENT VALUES ('7737127', 'Batson', 64, 60, 60, 80);
INSERT INTO STUDENT VALUES ('8012375', 'Beck', 83, 76, 88, 90);
SELECT * FROM STUDENT;
DROP TABLE WEIGHTS;
CREATE TABLE WEIGHTS
(
    HWWeight     NUMBER(2,0),
    MidWeight    NUMBER(2,0),
    FinWeight    NUMBER(2,0),
    QuizWeight   NUMBER(2,0)
);
INSERT INTO WEIGHTS VALUES (30, 30, 30, 10);
SELECT * FROM WEIGHTS;
COMMIT;
```

Write an anonymous PL/SQL block that will do the following: (Note: You should write and test your code incrementally to aid in debugging – do not go on to the next part until you have the previous part working correctly, or you are likely to have a much harder time tracking down any errors in your code.)

1. Read the values of the four weights stored in the WEIGHTS table, store them in variables of appropriate types, and display their values. (You may assume that the WEIGHTS table contains exactly one record.)

2. For each student in the STUDENT table, read the six values for the student and store them in variables of appropriate types. (Each student's average homework score, midterm exam score, final exam score, and quiz total will be in the range from 0 to 100.) Display the ID and name for each student, along with his/her overall score, computed as follows:

The overall score for a student will be the weighted average of his/her average homework score, midterm exam score, final exam score, and quiz total using the weights read from the WEIGHTS table (treat the weights as percentages – they will add up to 100). For example, if the weights in the WEIGHTS table were 40, 20, 20, 20 and a student's scores were 87, 81, 91, 90, then that student's overall score would be

$$(0.40 * 87) + (0.20 * 78) + (0.20 * 91) + (0.20 * 90) = 34.8 + 15.6 + 18.2 + 18.0 = 86.8.$$

3. Add a '\*' to the end of the display line for each student with an overall score lower than 70.

4. Finally, compute the average of the overall scores of the students and display it at the end.

For the sample database state created by the script given above, the output should be:

```
Weights: 30, 30, 30, 10
```

```
1234567 Batson      87.0
2233444 Bromfield  92.5
3933881 Freeman    67.1  *
4901244 Choi       85.5
5811621 Pena       94.9
6890016 Dudley     78.4
7737127 Batson     63.2  *
8012375 Beck       83.1
```

```
Average overall score: 81.46
```

(This is just an example, of course – your anonymous PL/SQL procedure should work correctly in general, not just for the sample database state I have given you.)

Include a comment at the top of your script file including your name, the course number and section, the assignment number, and the date of submission, e.g.:

```
/*
YourName
CSC 355 Section 602
Assignment 6
SubmissionDate, 2020
*/
```

Submit your script file to the Assignment 6 dropbox. You do not have to submit any output for this assignment, though you should test your script file to confirm that it works correctly.

**Remarks:**

1. You may cut and paste the script I have supplied into SQLDeveloper to set up the tables so that you can test your script, but your submitted answer should include only the code you have written to solve the problems – not any of my code. Be sure that your submitted script file is in a plain text form that can be run in SQLDeveloper for testing.
2. It is your responsibility to make sure that the files you have uploaded are readable and in the correct locations. You should check that you can successfully download your submitted files back from the course web site immediately after submitting them to be sure that they have been uploaded correctly.
3. As is the case for every assignment, all work must be completed individually – no collaboration between students or sharing of answers between students is permitted. Do not post this assignment to any website in search of answers, and do not consult posted answers on any website while completing the assignment. Your assignment must be your own individual work.

Eric J. Schwabe – 05/21/20