CS430/630 – Homework 5

50 points (5/100 of final grade)

Instructions: The homework is due on Mon, May 9th, 17:00. All questions must be submitted in digital form in a folder called HW5/ in your cs630 class folder.

A summer camp is using an Oracle database to manage its campers, activities, and which campers are registered for which activities. Each camper is identified by their unique `cid`. Each camper will have a name, an age, and a zip code corresponding to their home address. For each activity the camp offers, it is identified by a unique `aid`. It also has a name, a price which is the cost to a camper to register for the activity, and a capacity for the maximum number of campers allowed to participate in the activity. The registration table stores which campers have registered for which activities. You are allowed flexibility on the exact attribute types you use for your schema, given they reasonably match the specification below (e.g. in terms of number types, string types). Include the schema definition in your submission in a file called `schema.sql`.

```
Campers(cid: integer, name: string, age: integer, zipcode: integer)
Activities(aid: integer, name: string, price: real, capacity: integer)
Registration(cid: integer, aid: integer)
```

Question 1
Write a PL/SQL function that takes a capacity (an integer input) as an argument, and returns the activity which is the nearest to 50% of the given capacity. Remember, that the nearest can be either higher or lower. If there is a tie in activities given these parameters, pick the activity with the lowest price. If there is still a tie, pick the one with the highest activity id. File name must be Q1.sql.

Question 2
Write a PL/SQL function where given the arguments of a camper id and an activity id, you enroll the camper in the specified activity, as follows:

If the camper's age is greater than or equal to 50% of the mean age of the other campers registered for this activity **AND** if no other camper registered for the given activity shares the zip code of the camper given as the argument, register the given camper for the activity. If there are no other campers already registered for an activity, register the given camper for that activity.

Otherwise, if the input camper's age is less than 50% of the mean age of the campers enrolled in that activity **OR** if someone in that activity shares the same zip code as them, create a new activity and register the given camper in it. This new activity should have the same name, be half the price, and be double the capacity of the input activity. File name must be Q2.sql.

Question 3 [CS630 only]
Write a PL/SQL function where, given a zip code, it will return the ages that would be 2 standard deviation units above and below the mean age of campers from that zip code. For the age that is 2 standard deviations lower than the mean, round down to the nearest integer. For the age that is 2 standard deviations higher than the mean, round up to the nearest integer. File name must be Q3.sql.