Database Management Systems

(COP 5725)

Fall 2021

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Homework 1

Name:	
UFID:	
Email Address:	

Pledge (Must be signed according to UF Honor Code)

On my honor, I have neither given nor received unauthorized aid in doing this assignment.

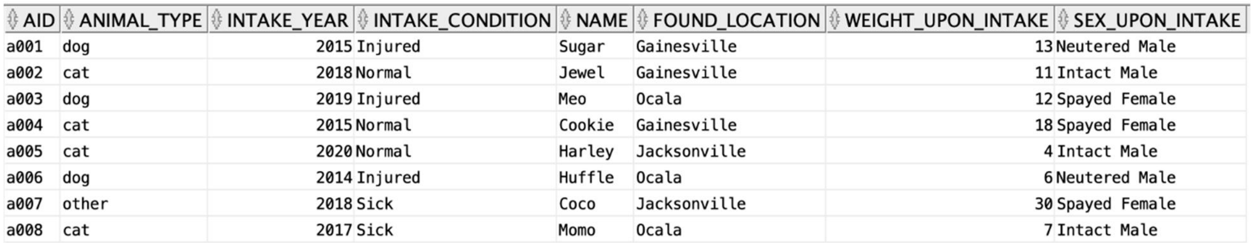
Signature

For scoring use only:

	Maximum	Received
Exercise 1	60	
Exercise 2	20	
Exercise 3	20	
Total	100	

Exercise 1 (Oracle) [60 points]

Consider the following table ‘**ANIMAL_SHELTER**’.



AID	ANIMAL_TYPE	INTAKE_YEAR	INTAKE_CONDITION	NAME	FOUND_LOCATION	WEIGHT_UPON_INTAKE	SEX_UPON_INTAKE
a001	dog	2015	Injured	Sugar	Gainesville	13	Neutered Male
a002	cat	2018	Normal	Jewel	Gainesville	11	Intact Male
a003	dog	2019	Injured	Meo	Ocala	12	Spayed Female
a004	cat	2015	Normal	Cookie	Gainesville	18	Spayed Female
a005	cat	2020	Normal	Harley	Jacksonville	4	Intact Male
a006	dog	2014	Injured	Huffle	Ocala	6	Neutered Male
a007	other	2018	Sick	Coco	Jacksonville	30	Spayed Female
a008	cat	2017	Sick	Momo	Ocala	7	Intact Male

Use your CISE Oracle account to create this table and perform the operations below. Provide **SQL statements** for all operations. Show your SQL queries *and* the outputs of all results as **screen snapshots** in Oracle SQL Developer.

In some SQL statements we will use the logical connectives AND and OR to connect sub-conditions: <condition1> AND <condition2>, <condition1> OR <condition2>.

The ORDER BY statement followed by a comma separated list of attribute names allows one to order tuples. This statement may only appear *at the end* of a SQL statement. Sorting is performed for each attribute separately and consecutively from right to left in the attribute list. This means that attributes listed first have higher order priority than attributes following them. Adding the keywords ASC or DESC behind each attribute means that the values of the corresponding attributes are sorted in *ascending* or *descending* order respectively. Example:

… ORDER BY Name ASC, Gender DESC

This statement should be distinguished from the statement

… ORDER BY Gender DESC, Name ASC

Due to their different semantics (try it out and see!), both commands yield different table results.

Further, you will need information about the *like* command for string pattern search. Please look it up online in Oracle manuals or SQL tutorials when the command is needed.

(1) [10 points] Create the table ‘ANIMAL_SHELTER’, show afterwards that the table is empty at this point, then insert all records into the table, and show afterwards that and how the table is filled with tuples.

(2) [6 points] Find the AID, animal_type, intake_year and name of animals who were rescued when they were sick. All tuples should be sorted in ascending order regarding the intake_year.

(3) [6 points] Find the number of dogs who were rescued in Ocala after 2015 (including 2015).

(4) [7 points] Find the name of injured animals and their types who were rescued in Gainesville between 2014 and 2016.

(5) [6 points] Find the name, type, and intake_condition of animals who were rescued when they were not in normal condition in 2014 or in 2017 and the sex is 'Intact Male'.

(6) [6 points] Find the name of animals along with animal_type and intake_year whose name has ‘le’ or ‘ar’ in it and rescued in 2014 or 2020.

(7) [8 points] Reorganize the tuples of the table in the sense that all tuples are sorted in ascending order regarding the animals’ type. For the same kind of type, the tuples should be sorted by intake_year in descending order and then for the same year by weight in descending order. Output the sorting attributes as well as the animals’ names.

(8) [5 points] Display the average weight of all dogs found in Ocala.

(9) [6 points] Increase the weight of animals whose weight were more than 15 by 20%. Show the updated table.

Exercise 2 (ER Model) [20 points]

Design an Entity-Relationship diagram that models a department management system and considers the requirements listed below. That means that you have to identify suitable entity sets, relationship sets, attributes, keys of entity sets (if not specified), and so on. Further add the cardinalities (1:1, 1:m, m:1, m:n) to the relationship sets and write down your assumptions regarding the cardinalities if there could be a doubt.

Consider the following requirements about a department management system:

- An employee has an ID which is unique, email address, name, date of birth, and age. Age is a derived attribute.
- There are two types of employees: Doctors and Nurses.
- Employees are belonged to a department that has a departmentID, name, the chair name, and an office address. The address includes street, city, state, and zip code.
- Doctors have a specialty and an office number. They can send messages to other doctors.
- A message includes a title and contents.
- A patient information includes a name, email address, date of birth, age, phone number, and gender. Age is a derived attribute.
- A doctor diagnoses his patients, and a prescription is written whenever a diagnosis is made.
- Nurses govern rooms that has room_ID, availability, and room type, and patients are assigned to a room.
- When a patient is assigned to a room, start and end date to the room will be recorded.
- Patients pay for prescribed medicine and medicine has price, quantity, and a code.

Exercise 3 (ER Model) [20 points]

Design an Entity-Relationship diagram that models an online course management system and considers the requirements listed below. That means that you have to identify suitable entity sets, relationship sets, attributes, keys of entity sets (if not specified), and so on. Further add the cardinalities (1:1, 1:m, m:1, m:n) to the relationship sets and write down your assumptions regarding the cardinalities if there could be a doubt.

Consider the following requirements about an online course management system:

- Every course has a unique ID, a title, and start and end dates.
- Each course might have prerequisites.
- Each course is taught by one instructor.
- Each instructor has a name, gender, email address, profile picture, and affiliation.
- Instructors can belong to an agency company that has a name, a reputation, and a number of instructors as attributes.
- Users can take multiple courses.
- Each user has a unique ID, a name, an email address, a date of birth, and a gender.
- A user can write reviews for courses. A review has an ID, a content, a score, and a timestamp.
- Each course offers multiple assignments. Assignments have an ID, a deadline, and a content.
- Users answer the assignments that the course offers.