

Database Management Systems

(CIS 4301 UF Online)

Fall 2019

Instructor: Dr. Markus Schneider

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	30	
Exercise 2	40	
Exercise 3	30	
Total	100	

Exercise 1 (Knowledge Questions) [30 points]

Please provide concise but precise answers.

1. [5 points] Explain the terms “database” and “DBMS” and their relationship.
2. [4 points] List and explain the main problems of file systems.
3. [5 points] What is the ER model? Explain its three components.
4. [4 points] Explain the terms “DDL” and “DML”.
5. [5 points] What are logical data independence and physical data independence?
6. [4 points] Explain the terms “generalization” and “aggregation”, and provide an example for each term.
7. [3 points] What are the advantages of Database Systems if you characterize them by concise phrases of at most three words each?

Exercise 2 (Oracle) [40 points]

Consider the following database table `Employees`.

EID	NAME	GENDER	JOB	HIRED_YEAR	SALARY	CITY
1001	Reilly Martins	F	salesman	2016	1500	Gainesville
1002	Amirah Zavala	M	clerk	2016	1300	Gainesville
1003	Sabrina Contreras	F	salesman	2017	1400	Ocalar
1004	Beulah Farley	M	clerk	2015	1000	Gainesville
1005	Griff Ashton	M	clerk	2013	1100	Jacksonville
1006	Amara Berg	F	analyst	2017	2500	Ocalar
1007	Mazie Herring	M	manager	2019	2000	Jacksonville
1008	Dana Ochoa	F	manager	2016	2200	Ocalar

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

- (1) [6 points] Create the `Employees` table and insert all the records into the table.
- (2) [6 points] Find the names of employees who were hired in 2016.
- (3) [5 points] Find the number of employees who live in Gainesville.
- (4) [6 points] Find the name of employees whose salary is less than 1300 and work as a clerk.
- (5) [6 points] Find the name of employees who are female and work as manager.
- (6) [5 points] Display the average salary of all employees. [Note: For answering this query, please look into Oracle SQL manuals how to compute the average of a set of values.]
- (7) [6 points] Find those students whose name has ‘re’ or ‘la’ in it. [Note: For answering this query, please look into Oracle SQL manuals how to formulate a substring search.]

Exercise 3 (ER Model) [30 points]

Consider the following requirements about a department management system:

- A user has an email address which is unique, name, date of birth, current address, and age. Age is a derived attribute.
- There are two types of users: students and professors.
- Graduate students are students and have an SSN.
- A professor has a title, tenure status, and an SSN.
- A hometown where users were born has a city name and a state name.
- Graduate students are advised by a professor.
- Students enroll in courses that have a title, a description, year, semester, and credits.
- A professor teaches courses, and an evaluation form is created.
- Students and professors belong to a department that has a unique department ID, name, and office address. The address includes street, city, state, and zip code.

Design an Entity-Relationship diagram that models this scenario and takes into account the requirements listed above. 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.