

Database Management Systems (COP 5725)

(Spring 2018)

Instructor: Dr. Markus Schneider

TA: Matin Kheirhahan

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	30	
Exercise 3	20	
Exercise 4	20	
Total	100	

Exercise 1 (Knowledge Questions) [30 points]

Please provide concise but precise answers.

1. What is a database? What is a DBMS? What is the relationship of database and DBMS? [4 points]
2. Briefly state three advantages of using database systems? [3 points]
3. What is the data normalization? Give an example where controlled redundancy is helpful. [6 points]
4. What is a Data Model? What are the most common data models that a DBMS has? [4 points]
5. DBMS offers data abstraction. Explain it briefly. [6 points]
6. Explain 3 most common DBS abstraction levels. [3 points]
7. When do you think one should not use a DBMS? [4 points]

Exercise 2 (Oracle) [30 points]

Consider the following table 'MOVIE' maintained by a class database.

MOVIE_ID	TITLE	GENRE	RUNTIME	YR	BUDGET	SELL	DIRECTOR
1	Jurassic Park	SciFi	127	1993	63	1029	Steven Spielberg
2	Guardians of the Galaxy	SciFi	136	2017	200	863	James Gunn
3	Schindlers List	Drama	195	1993	22	221	Steven Spielberg
4	Saving Private Ryan	Drama	169	1998	70	480	Steven Spielberg
5	Fight Club	Drama	151	1999	63	100	David Fincher
6	The Social Network	Drama	120	2010	40	225	David Fincher
7	This is the end	Comedy	107	2013	32	126	Seth Rogen
8	The Interview	Comedy	112	2015	44	12	Seth Rogen

MOVIE_ID is the primary key. Use your CISE Oracle account to create this table and provide SQL statements for all colloquial queries below. Show the outputs of all results as screen snapshots in Oracle. [5 points each]

- (1) Create the MOVIE table.
- (2) Insert all the records into the MOVIE table.
- (3) Find the list of movie titles which are shorter than 2 hours (120 minutes).
- (4) Find the list of movie titles and their directors that are NOT profitable (budget > sell).
- (5) Find the list of movie titles that start with 'The'.
- (6) Find the list of drama movie titles that are released after 2000 and their profits under attribute *PROFIT*.

Exercise 3 (ER Model) [20 points]

Consider the following requirements about a Massive Open Online Course (MOOC) system:

- Every course has a unique ID, title, start and end dates.
- Each course might have prerequisites.
- Each course is offered by one instructor.
- Each instructor has a unique ID, name, email address, profile picture, address (street, city, state, and zip code), and affiliation (university of institute).
- Online users can take multiple courses.
- Each online user has a unique ID, name, email address, profile picture, date of birth, and gender.
- An online user might follow other users. Following is directional. For example, if A follows B, that does NOT entail B follows A.
- An online user can write reviews for courses. A review has content, a score (ranging from 1 to 5) and a timestamp.

Design an Entity-Relationship diagram that models the MOOC system 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, and so on. Further add the cardinalities (1:1, 1:m, m:1, m:n) to the relationship sets.

Exercise 4 (ER Model) [20 points]

Suppose you are designing a recipe-sharing website. This website has the following entities and requirements:

- Every recipe has a unique ID, name, time-to-cook, picture, and calorie.
- Each recipe has multiple ingredients. Ingredient amounts are specified.
- An ingredient entity has a unique ID, name, unit (pound, gallon, etc.), and unit price.
- Every recipe is prepared by a chef.
- A chef has a unique ID, name, and email address.
- Users can write reviews for recipes. A review has content, timestamp, and a score (ranging from 1 to 10).
- Every user has a unique ID, name, gender, age, and email address.
- Users can follow chefs.

Design an Entity-Relationship diagram that models the recipe-sharing system 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, and so on. Further add the cardinalities (1:1, 1:m, m:1, m:n) to the relationship sets.