

- 1) A database is required to record data about geographical features in a number of countries. The data relates to rivers, lakes, mountains and cities. It is assumed that each such feature can be uniquely identified by name, except for cities, where the name is only unique within the country to which it belongs. For each country, identified by its name, data is required for its area, population and capital city. For each mountain, record the height, and the country in which it lies. For each river, record its total length, and its length in each country through which it flows. For each lake, record its area, maximum depth and the proportion of the lake owned by each country on its shoreline. For each city record the country to which it belongs and any river (just one) which may flow through it.
- a) Develop an ER model for the following data requirements. Your model should include entity identifiers and the degree and participation constraints on each relationship. Also include all constraints and any assumptions you make. *(3 points)*
 - b) Design the tables necessary for the database. *(3 points)*
 - c) Create the tables in SQL. *(3 points)*
 - d) Insert one record into each of your tables. *(2 points)*
- 2) Consider the following database that contains tables CD and Artist with several rows in them.

SELECT * FROM CD;

CDID	ARTID	CDTITLE	CDPRICE	CDGENRE
1	1	Mix	9.99	Rock
2	1	Magic Lines	11.49	Rock
3	2	Broadcast	9.99	Electronica
4	2	Vicarious	9.99	Electronica
5	3	Supersystem	9.99	Rock
6	3	Communicate	11.49	Rock
7	4	The 88	12.49	Electronica
8	5	Live at the Matterhorn	9.99	Reggae/Dub
9	7	Uprising	11.49	Electronica
10	6	Killervision	11.49	Reggae/Dub

10 rows selected.

SELECT * FROM Artist;

```
ARTID ARTNAME
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1 Stellar*
2 Strawpeople
3 The Feelers
4 Minuet
5 Fat Freddy's Drop
6 Salmonella Dub
7 Concord Dawn
```

7 rows selected.

- a)** Find a list of the titles (only) of CDs which are Electronica albums costing between 10.00 and 12.00 *(2,5 points)*

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CDTITLE
-----
Uprising
```

- b)** Write an SQL query that returns all the information from the CD and Artist tables where the artID values in the rows from the two tables are equal *(2,5 points)*

CDID	ARTID	CDTITLE	CDPRICE	CDGENRE	ARTID	ARTNAME
1	1	Mix	9.99	Rock	1	Stellar*
2	1	Magic Lines	11.49	Rock	1	Stellar*
3	2	Broadcast	9.99	Electronica	2	Strawpeople
4	2	Vicarious	9.99	Electronica	2	Strawpeople
5	3	Supersystem	9.99	Rock	3	The Feelers
6	3	Communicate	11.49	Rock	3	The Feelers
7	4	The 88	12.49	Electronica	4	Minuet
8	5	Live at the Matterhorn	9.99	Reggae/Dub	5	Fat Freddy's Drop
9	7	Uprising	11.49	Electronica	7	Concord Dawn
10	6	Killervision	11.49	Reggae/Dub	6	Salmonella Dub

c) Find a list of the artist names, titles, and genres of all CDs that cost less than 12.00 sorted by artist name then CD title (2 points)

ARTNAME	CDTITLE	CDGENRE
Concord Dawn	Uprising	Electronica
Fat Freddy's Drop	Live at the Matterhorn	Reggae/Dub
Salmonella Dub	Killervision	Reggae/Dub
Stellar*	Magic Lines	Rock
Stellar*	Mix	Rock
Strawpeople	Broadcast	Electronica
Strawpeople	Vicarious	Electronica
The Feelers	Communicate	Rock
The Feelers	Supersystem	Rock

d) Change the data in the tables by adding 1% to the price of the rock CDs. (2 points)
Hint: multiply by 1.01