

OLLSCOIL NA hÉIREANN
THE NATIONAL UNIVERSITY OF IRELAND, CORK

COLÁISTE NA hOLLSCOILE, CORCAIGH
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SEMESTER 1 – WINTER 2015

CS1106: Introduction to Relational Databases

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1.5 Hours

Answer All Questions
Total marks 100%

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PLEASE ENSURE THAT YOU HAVE THE CORRECT EXAM

Question 1 [10%]

Draw a suitable ER diagram to model the following aspects of a collection of different TV series. Each TV series has a name and a creator and comprises a number of episodes. Each episode has a title, a number (within the series), a director and a date when it first aired. Each character appearing in a series has a name and each character may appear in some set of the episodes of a series (not necessarily every episode). Each actor has a name and may play various characters in different series. We assume that each character is played by only one actor. *← attribute*

Question 2 [36 %]

Consider the following structure for a single-table database for the Gruff Tours travel agency to house information about upcoming trips the agency has planned. Each trip has a unique id number, a title (e.g. "Treasures of Sicily"), a date of departure, a duration (in days), a capacity (i.e. the number of available places on the trip) and a price (in euros and cents).

trips(id, title, dep_date, length, places, price)

In respect of Parts (i) to (iv) below, give a complete SQL statement to accomplish the stated task.

- (i) Create a table with the specified attributes, indicating an appropriate type for each attribute and an appropriate key for the table. (6%)
- (ii) Insert three complete rows into the table. You can invent suitable titles and prices etc. for the trips, but you must conform to SQL's syntax rules. (6%)
- (iii) Update the table so that the prices of each trip is increased by 10%. (6%)
- (iv) Delete all trips scheduled to depart during the month of July 2016. (6%)
- (v) State how the database might be enhanced to capture information about individual customers (names, and addresses) and which customers are booked on which trips. Bear in mind that each trip may have many customers booked and each customer may be booked on more than one trip. Describe (in words) any additional tables you require (table name and attributes) and any modifications to the existing table. State clearly any relationship among the tables in your modified design. (12%)

Question 3 [54 %]

Consider the following schema for a hypothetical hotel reservation system. We assume that there are three different room type: single, double and twin. We also assume that the each room in each hotel has a fixed price that does not vary by date or availability.

hotels(hotel_num, hotel_name, city)

rooms(room_num, hotel_num, room_type, price)

bookings(hotel_num, guest_num, arr_date, dep_date, room_num)

guests(guest_num, guest_name, guest_address)

- (i) List all twin hotel rooms in Galway priced at less than €100. For each such room display the hotel name, the room number and the price. (6%)

- (ii) List alphabetically by name all customers who stayed at the Hotel Seaview in Athlone in July 2015. We treat a booking as belonging to the month in which its arrival date fell. (6%)
- (iii) List on a city-by-city basis, the total number of double rooms across all the hotels in each city and the average price of a double room. Restrict the result to include only those cities with at least 100 such rooms. (9%)
- (iv) List the number of single rooms available at the Hotel Scarafaggio in Cork on 1 February 2016. (9%)
- (v) List all occasions on which the following two guests stayed at the same hotel at the same time: Vladimir Putin and Barack Obama. For each occasion, list the name and location of the hotel and the arrival and departure dates of both guests. (12%)
- (vi) List the turnover of each hotel for each year since 2000. The value of each booking is the number of nights involved multiplied by the price per night. The turnover is the sum of the values of the individual room bookings. Note the function YEAR() applied to a date will return the year part of that date. Note also that if $d1$ and $d2$ are dates, then the difference $d1 - d2$ captures the length (in days) of the interval between them. We treat a booking as belonging to the year in which its arrival date fell. (12%)