Midterm: Databases 2023

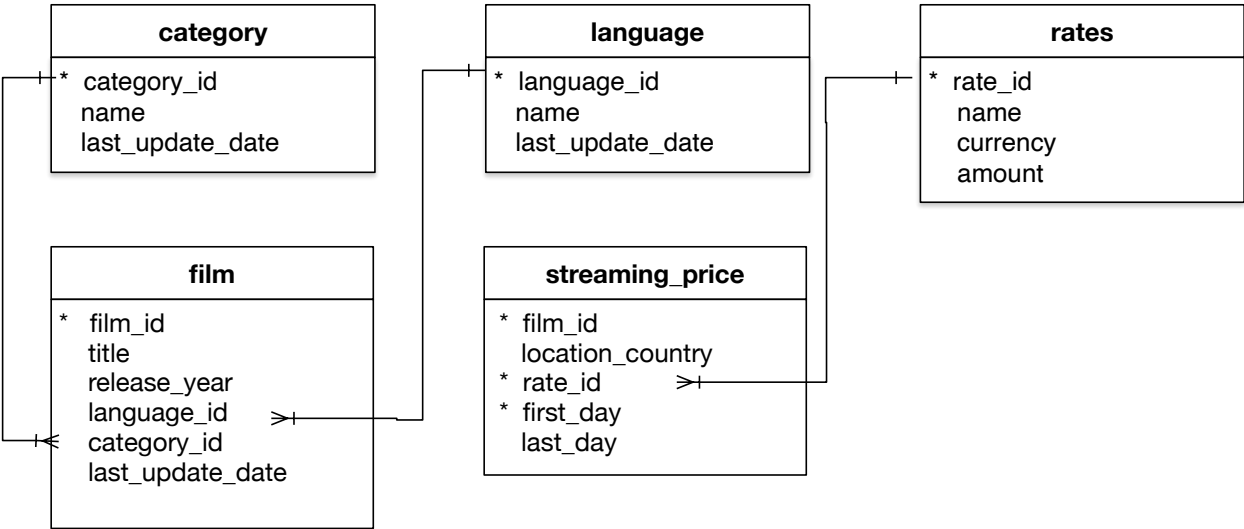Rules: Submission to D2L as a pdf in readable form.

30 pts

Problem 1:

Find the closure of all subsets of the following tables. Find all the keys. Decide whether the tables are in third, Boyce-Codd, or fourth normal form.

R(A,B,C,D,E) with FD AB →C, BC →AD, D → E.

20 pts

Problem 2:

Create the database tables in MySQL for the diagram above. Specify primary keys, restrictions on attributes, and foreign keys. Make sure that the attributes have proper checks and default values. Because "language" is a keyword, use "language1" as the table name. (Make sure that you specify if you solve this with a different DBMS.) Submit screen-shots.

Problem 3:

Use the database classicmodels (from mysqltutorial.org).

5 pts

(a) Find the different product-scales of the products in the data-base.

5 pts

(b) Find the products, the buy prices, and the MSRP for products with the 1:10 scale.

5 pts (c) Find the markups in percent ($100 \cdot \dfrac{\text{MSRP}}{\text{buy-price}} - 100$) rounded to two decimal digits for products with the 1:50 scale. Do not forget to label the markup-column as "mark-up".

5 pts (d) For each product scale, find the maximum MSRP.

5 pts (e) Find the maximum MSRP and give the name of the product that achieves the maximum.

5 pts (f) Find the product name, buy-price, and MSRP for each scale with maximum MSRP. Hint: Use a subquery in the FROM clause.

5 pts (g) Find the customer name, the payment amount, the check number, and the payment date where the payment is less than US$2000.00.

5 pts (h) Find the five customers who **paid** the most (not ordered the most).

5 pts (i) Find the customer names and their countries who have a sales representative with an office in the USA.

5 pts (j) Find the names of customer who ordered an item where the product line description contains the word "replica".