HW #2
CS 3083 Intro to Database Systems Fall 2019
Prof Frankl

1. Problem 1
    a. Consider the ER diagram shown in (1) in hw2-figs (page 1). Derive a relational database schema from the ER diagram.You may show your answer with a schema diagram or with text indicating the relation schemas, their attributes, primary keys and foreign keys.
    b. Show the tuples (rows) that would be in the relations (tables) in the following situation:
        i. the item with itemID = 123 has the description “Organic cotton T-shirt with cool logo” and is available in sizes large and small, each in colors blue and green.
        ii. Each member of your homework group is a customer. (You may use your real addresses or 370 Jay St, Brooklyn, NY 11201.
        iii. Each member of your group has ordered a small tee-shirt and a large tee-shirt in the same color, with some short note.
    c. Would it be possible to have the data described in (b) if the primary key of Item were (itemID, color) instead of (itemID, color, size) ? Why or why not?
    d. Would it be possible to have the data described in (b) if the primary key of Item were (itemID, size) instead of (itemID, color, size) ? Why or why not?

2. Problem 2
    a. Consider the ER diagram shown in (2a, 2b) in hw2-figs (pages 2, 3). This is the same ER model shown in the two different notations we studied. Derive a relational database schema from the ER diagram.You may show your answer with a schema diagram or with text indicating the relation schemas, their attributes, primary keys and foreign keys.
    b. Show the tuples (rows) that would be in the relations (tables) in the following situation:
        i. the item with itemID = 123 has the description “Organic cotton T-shirt with cool logo” and is available in sizes large and small, each in colors blue and green.
        ii. Each member of your homework group is a customer. (You may use your real addresses or 370 Jay St, Brooklyn, NY 11201.
        iii. Each member of your group has ordered a small tee-shirt and a large tee-shirt in the same color, with some short note.

3. Consider the **takes** and **student** relation schemas from the university database schema. Using netID of a member of your group as student ID, Write relational algebra queries for each of the following:
    a. Find the course_id and grade for each course that the student whose ID is <your net ID> has taken.
    b. Find the course_id and grade for each course that the student whose ID is <your net ID> took in 2018
    c. Find the student ID of each student who took course_id ‘CS-UY 3083’ in Fall 2019
    d. Find the name of each student who took course_id ‘CS-UY 3083’ in Fall 2019