

COSC 4820
Database Systems, Spring 2023
Homework 1, Relation Schema

For this assignment you will be writing MySQL (SQL) statements. I expect that your answers will actually be READABLE. Do not just start at the left margin and type until you are done. Format your answers so that they are easy to read/grade. AND all the MySQL (SQL) statements MUST have the correct syntax, including the statement end.

Using the online documentation for MySQL is NOT a problem. Talking to your classmates is okay. Copying someone else's answers (online or your friend's) is CHEATING. I expect **complete** academic honesty in this course.

Question 1: [30 points]

A database has four relations whose schema are

```
Product(maker, model, type)
PC(model, speed, ram, hd, price)
Laptop(model, speed, ram, hd, screen, price)
Printer(model, color, type, price)
```

We assume that model numbers are unique over all manufacturers and product types. Processor speed will be in gigahertz, RAM in megabytes, laptop screen size in inches. For the printers, color is true or false, and type will be laser or ink-jet.

Give CREATE or ALTER statements for the schema for the computer component relations.

- (a) [5 points] A suitable schema for relation **Product**.
- (b) [5 points] A suitable schema for relation **PC**.
- (c) [5 points] A suitable schema for relation **Laptop**.
- (d) [5 points] A suitable schema for relation **Printer**.
- (e) [5 points] An alteration of your **Printer** schema from (d) to delete the attribute **color**.
- (f) [5 points] An alteration of your **Laptop** schema from (c) to add the attribute **od** (optical-disk type, e.g., cd or dvd). Let the default value for this attribute be 'none' if the laptop does not have an optical-disk.

Question 2: [30 points]

Another database, capital ships in World War II, also has four relations whose schema are

Classes(class, type, country, numGuns, bore, displacement)
Ships(name, class, launched)
Battles(name, data)
Outcomes(ship, battle, result)

Ships are built in “classes” from the same design, and the class is usually named for the first ship in that class. The types (for now) are limited to battlecruiser (bc) and battleship (bb). Any others that are added will also have 2 character types. Bore is the diameter of the main guns in inches, and displacement is the weight in tons. For the Outcomes of the battles, the result is one of ‘sunk’, ‘damaged’, or ‘ok’.

Give CREATE or ALTER statements for the schema for the World War II ship relations.

- (a) [5 points] A suitable schema for relation **Classes**.
- (b) [5 points] A suitable schema for relation **Ships**.
- (c) [5 points] A suitable schema for relation **Battles**.
- (d) [5 points] A suitable schema for relation **Outcomes**.
- (e) [5 points] An alteration of your **Classes** schema from (a) to delete the attribute **bore**.
- (f) [5 points] An alteration of your **Ships** schema from (b) to include the attribute **yard** giving the shipyard where the ship was built.