

ΠΜΣ547 ΘΕΜΕΛΙΩΣΗ ΒΑΣΕΩΝ ΔΕΔΟΜΕΝΩΝ
Εαρινό Εξάμηνο 2008-2009
Πρώτη Σειρά Ασκήσεων

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Προσοχή: Αν οι απαντήσεις σας είναι γραμμένες χρησιμοποιώντας LaTeX θα έχετε 10% προσαύξηση στο βαθμό σας. Μ' αυτό το τρόπο προσπαθώ να σας ενθαρρύνω να μην χρησιμοποιήσετε Microsoft Word μια που αυτό το πρόγραμμα δεν είναι για Μαθηματικά! Αν δεν γνωρίζετε ήδη LaTeX, να η ευκαρία!

ΑΣΚΗΣΕΙΣ

1. This exercise is from the book “A First Course in Database Systems” by Jeffrey Ullman and Jennifer Widom. Prentice-Hall, 1997.

The exercise concerns World War II capital ships and involves the following relation schemas:

Classes: class, type, country, numGuns, bore, displacement

Ships: name, class, launched

Battles: name, date

Outcomes: ship, battle, date

Ships are built in “classes” from the same design, and the class is usually named for the first ship of that class. Relation **Classes** records the name of the class, the type (**bb** for battleship or **bc** for battlecruiser), the country that built the ship, the number of main guns, the bore (the diameter of the gun barrel, in inches) of the main guns, and the displacement (weight, in tons). Relation **Ships** records the name of the ship, the name of its class, and the year in which the ship was launched. Relation **Battles** gives the name and the date of battles involving these ships, and relation **Outcomes** gives the result (sunk, damaged or ok) for each ship in each battle. The file `data.pdf` give some sample data for these four relations.

Write expressions in named relational algebra, relational calculus and SQL to answer the following queries:

- Find the classes that had only one ship as a member of that class.
 - Find those countries that had both battleships and battlecruisers.
 - Find those ships that “lived to fight another day”; they were damaged in one battle, but later fought in another.
 - Find those battles with at least three ships of the same country.
2. Ασκήσεις 4.2, 4.5, 4.14, 4.15 (β) του βιβλίου.
 3. Ασκήσεις 5.3, 5.5, 5.13(β), 5.16 του βιβλίου.