HW3 Solution

Exercise 2.4.3a

$R1 := \sigma_{bore \geq 16}(Classes)$
$R2 := \pi_{class,country}(R1)$

class	country
Iowa	USA
North Carolina	USA
Yamato	Japan

Exercise 2.4.3b

$R1 := \sigma_{launched < 1921}(Ships)$
$R2 := \pi_{name}(R1)$

name
Haruna
Hiei
Kirishima
Kongo
Ramillies
Renown
Repulse
Resolution
Revenge
Royal Oak
Royal Sovereign
Tennessee

Exercise 2.4.3c

$R1 := \sigma_{battle=Denmark\ Strait\ AND\ result=sunk}(Outcomes)$
$R2 := \pi_{ship}(R1)$

ship
Bismarck
Hood

Exercise 2.4.3d

$R1 := Classes \bowtie Ships$
$R2 := \sigma_{launched > 1921 \text{ AND } displacement > 35000}(R1)$
$R3 := \pi_{name}(R2)$

name
Iowa
Missouri
Musashi
New Jersey
North Carolina
Washington
Wisconsin
Yamato

Exercise 2.4.3e

$R1 := \sigma_{battle=Guadalcanal}(Outcomes)$

$R2 := Ships \bowtie_{(ship=name)} R1$
$R3 := Classes \bowtie R2$
$R4 := \pi_{name,displacement,numGuns}(R3)$

name	displacement	numGuns
Kirishima	32000	8
Washington	37000	9

Exercise 2.4.3f

$R1 := \pi_{name}(Ships)$
$R2 := \pi_{ship}(Outcomes)$
$R3 := \rho_{R3(name)}(R2)$
$R4 := R1 \cup R3$

name
California
Haruna
Hiei
Iowa
Kirishima
Kongo
Missouri
Musashi
New Jersey
North Carolina
Ramillies
Renown
Repulse
Resolution
Revenge
Royal Oak
Royal Sovereign
Tennessee
Washington
Wisconsin
Yamato
Arizona
Bismarck
Duke of York
Fuso
Hood
King George V
Prince of Wales
Rodney
Scharnhorst

South Dakota
West Virginia
Yamashiro

Exercise 2.4.3g

From 2.3.2, assuming that every class has one ship named after the class.

$R1 := \pi_{class}(Classes)$
$R2 := \pi_{class}(\sigma_{name <> class}(Ships))$
$R3 := R1 - R2$

class
Bismarck

Exercise 2.4.3h

$R1 := \pi_{country}(\sigma_{type=bb}(Classes))$
$R2 := \pi_{country}(\sigma_{type=bc}(Classes))$
$R3 := R1 \cap R2$

country
Japan
Gt. Britain

Exercise 2.4.3i

$R1 := \pi_{ship,result,date}(Battles \bowtie_{(battle=name)} Outcomes)$
$R2 := \rho_{R2(ship2,result2,date2)}(R1)$
$R3 := R1 \bowtie_{(ship=ship2\ AND\ result=damaged\ AND\ date < date2)} R2$
$R4 := \pi_{ship}(R3)$

No results from sample data.