Exercise 1.

create table Classes(

class varchar(20),

type char(2),

country varchar(20),

numGuns int,

bore int,

displacement int,

primary key(class)

);

create table Ships(

name varchar(20),

class varchar(20),

launched int,

primary key(name,class)

);

create table Battles(

name varchar(20),

date\_fought varchar(12),

primary key(name)

);

create table Outcomes(

ship varchar(20),

battle varchar(20),

result varchar(10),

primary key(ship)

);

INSERT INTO Classes VALUES('Bismarck','bb','Germany',8,15,42000);

INSERT INTO Classes VALUES('Kongo','bc','Japan',8,14,32000);

INSERT INTO Classes VALUES('North Carolina','bb','USA',9,16,37000);

INSERT INTO Classes VALUES('Renown','bc','Gt. Britain',6,15,32000);

INSERT INTO Classes VALUES('Revenge','bb','Gt. Britain',8,15,29000);

INSERT INTO Classes VALUES('Tennessee','bb','USA',12,14,32000);

INSERT INTO Classes VALUES('Yamato','bb','Japan',9,18,65000);

INSERT INTO ships VALUES('California','Tennessee',1921);

INSERT INTO ships VALUES('Haruna','Kongo',1915);

INSERT INTO ships VALUES('Hiei','Kongo',1914);

INSERT INTO ships VALUES('Iowa','Iowa',1943);

INSERT INTO ships VALUES('Kirishima','Kongo',1914);

INSERT INTO ships VALUES('Kongo','Kongo',1913);

INSERT INTO ships VALUES('Missouri','Iowa',1944);

INSERT INTO ships VALUES('Musashi','Yamato',1942);

INSERT INTO ships VALUES('New Jersey','Iowa',1943);

INSERT INTO ships VALUES('North Carolina','North Carolina',1941);

INSERT INTO ships VALUES('Ramilles','Revenge',1917);

INSERT INTO ships VALUES('Renown','Renown',1916);

INSERT INTO ships VALUES('Repulse','Renown',1916);

INSERT INTO ships VALUES('Resolution','Revenge',1916);

INSERT INTO ships VALUES('Revenge','Revenge',1916);

INSERT INTO ships VALUES('Royal Oak','Revenge',1916);

INSERT INTO ships VALUES('Royal Sovereign','Revenge',1916);

INSERT INTO ships VALUES('Tennessee','Tennessee',1920);

INSERT INTO ships VALUES('Washington','North Carolina',1941);

INSERT INTO ships VALUES('Wisconsin','Iowa',1944);

INSERT INTO ships VALUES('Yamato','Yamato',1941);

INSERT INTO Battles VALUES('North Atlantic','27-May-1941');

INSERT INTO Battles VALUES('Guadalcanal','15-Nov-1942');

INSERT INTO Battles VALUES('North Cape','26-Dec-1943');

INSERT INTO Battles VALUES('Surigao Strait','25-Oct-1944');

INSERT INTO Outcomes VALUES('Bismarck','North Atlantic', 'sunk');

INSERT INTO Outcomes VALUES('California','Surigao Strait', 'ok');

INSERT INTO Outcomes VALUES('Duke of York','North Cape', 'ok');

INSERT INTO Outcomes VALUES('Fuso','Surigao Strait', 'sunk');

INSERT INTO Outcomes VALUES('Hood','North Atlantic', 'sunk');

INSERT INTO Outcomes VALUES('King George V','North Atlantic', 'ok');

INSERT INTO Outcomes VALUES('Kirishima','Guadalcanal', 'sunk');

INSERT INTO Outcomes VALUES('Prince of Wales','North Atlantic', 'damaged');

INSERT INTO Outcomes VALUES('Rodney','North Atlantic', 'ok');

INSERT INTO Outcomes VALUES('Scharnhorst','North Cape', 'sunk');

INSERT INTO Outcomes VALUES('South Dakota','Guadalcanal', 'ok');

INSERT INTO Outcomes VALUES('West Virginia','Surigao Strait', 'ok');

INSERT INTO Outcomes VALUES('Yamashiro','Surigao Strait', 'sunk');

Exercise 2.



select b.name from Classes a, ships b

where a.class=b.class and a.displacement >35000 and b.LAUNCHED>=1921;

2.

select d.ship,c.DISPLACEMENT,c.NUMGUNS

from

(SELECT \*

FROM Outcomes a

FULL OUTER JOIN Ships b

ON a.ship=b.name) d

FULL OUTER JOIN classes c

on d.class=c.class

where d.battle='Guadalcanal';

3.

SELECT a.name as name

FROM ships a

union

SELECT b.ship as name

FROM outcomes b;

4.

SELECT a.country as country

FROM classes a

where a.type='bb'

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SELECT b.country as country

FROM classes b

where b.type='bc';

5.

CREATE VIEW a AS SELECT Outcomes.ship, Outcomes.battle, Outcomes.result, Battles.date\_fought FROM Outcomes JOIN Battles ON Outcomes.battle=Battles.name;

select b.ship

from a b,a c

where

(select TO\_DATE(c.DATE\_FOUGHT,'DD-MON-YYYY')

from dual)>(select TO\_DATE(b.DATE\_FOUGHT,'DD-MON-YYYY')

from dual) and b.RESULT='damaged' and b.ship=c.ship;

6.

SELECT country

FROM classes b

WHERE b.NUMGUNS =

(SELECT max(NUMGUNS)

FROM classes

);

7.

create view ques777 as

(select a.class,a.numguns,a.bore,b.name

From classes a, ships b

Where a.class=b.class

);

select a.name

from ques777 a,(select bore,max(numguns) as maxx from ques777 group by bore) b

where a.bore=b.bore and a.numguns=b.maxx ;

8.

select x.class,NVL2(y.SUNK\_SHIPS,y.SUNK\_SHIPS,0) as SUNK\_SHIPS

from

(select class

from ships

group by class

having count(\*)>=3) x

left join

(select class,count(\*) as SUNK\_SHIPS

from

outcomes b,

ships c

where b.ship=c.name and b.result='sunk'

group by class) y

on x.class=y.class;

Exercise 3.

1.

INSERT INTO Classes (class, type, country, bore, displacement)

VALUES ('Vittorio Veneto','bb','Italia',15,41000);

INSERT INTO Ships(name, class, launched)

VALUES ('Vittorio Veneto','Vittorio Veneto',1940);

INSERT INTO Ships(name, class, launched)

VALUES ('Italia','Vittorio Veneto',1940);

INSERT INTO Ships(name, class, launched)

VALUES ('Roma','Vittorio Veneto',1942);

2.

delete from classes

where class in

(select class

from classes

minus

select class

from ships

group by class

having count(\*)>=3);

3.

UPDATE classes

SET bore=bore\*2.5, DISPLACEMENT=DISPLACEMENT\*1.1;

Exercise 4.

1.

ALTER TABLE Classes ADD CONSTRAINT classes\_pk PRIMARY KEY(class);

CREATE TABLE Exceptions(

row\_id ROWID,

owner VARCHAR2(30),

table\_name VARCHAR2(30),

constraint VARCHAR2(30)

);

ALTER TABLE Ships ADD CONSTRAINT ship\_to\_classes\_fk FOREIGN KEY(class) REFERENCES Classes(class) EXCEPTIONS INTO Exceptions;

DELETE FROM Ships WHERE class IN ( SELECT class FROM Ships, Exceptions WHERE Ships.rowid = Exceptions.row\_id );

ALTER TABLE Ships ADD CONSTRAINT ship\_to\_classes\_fk FOREIGN KEY(class) REFERENCES Classes(class);

2.

ALTER TABLE battles ADD CONSTRAINT battles\_pk PRIMARY KEY(name);

ALTER TABLE outcomes ADD CONSTRAINT o\_to\_b\_fk

FOREIGN KEY(battle) REFERENCES battles(name)

EXCEPTIONS INTO Exceptions;

//not need for next steps,since there are no exceptions in this question:

DELETE FROM outcomes

WHERE battle IN (

SELECT battle

FROM outcomes, Exceptions

WHERE outcomes.rowid = Exceptions.row\_id

);

ALTER TABLE outcomes ADD CONSTRAINT o\_to\_b\_fk

FOREIGN KEY(battle) REFERENCES battles(name);

3.

ALTER TABLE ships ADD CONSTRAINT ships\_pk PRIMARY KEY(name);

ALTER TABLE outcomes ADD CONSTRAINT o\_to\_s\_fk

FOREIGN KEY(ship) REFERENCES ships(name)

EXCEPTIONS INTO Exceptions;

DELETE FROM outcomes

WHERE ship IN (

SELECT ship

FROM outcomes, Exceptions

WHERE outcomes.rowid = Exceptions.row\_id

);

ALTER TABLE outcomes ADD CONSTRAINT o\_to\_s\_fk

FOREIGN KEY(ship) REFERENCES ships(name);

4.

ALTER TABLE classes ADD CONSTRAINT check\_bore Check(bore<=16)

EXCEPTIONS INTO Exceptions;

ALTER TABLE ships drop CONSTRAINT ship\_to\_classes\_fk;

DELETE FROM classes WHERE classes.bore IN ( SELECT distinct bore FROM classes, Exceptions WHERE classes.rowid = Exceptions.row\_id );

ALTER TABLE classes ADD CONSTRAINT check\_bore Check(bore<=16)

5.

ALTER TABLE classes ADD CONSTRAINT check\_q6 Check(not(numguns>=9) or bore<=14)

EXCEPTIONS INTO Exceptions;

DELETE FROM classes where class in(SELECT classes.class FROM classes, Exceptions WHERE classes.rowid = Exceptions.row\_id)

6.

CREATE OR REPLACE VIEW OutcomesView AS

SELECT ship, battle, result

FROM Outcomes O

WHERE NOT EXISTS (

SELECT \*

FROM Ships S, Battles B

WHERE S.name=O.ship AND O.battle=B.name AND

S.launched > TO\_NUMBER(TO\_CHAR(B.date\_fought, 'yyyy'))

)

WITH CHECK OPTION;

7.

CREATE OR REPLACE VIEW q9View AS

SELECT a.name,a.class, launched

FROM ships a

WHERE NOT EXISTS (

SELECT \*

FROM Ships S, classes b

WHERE S.name=a.name AND a.CLASS=b.class and

S.launched < (select min(launched) from ships d where d.class=a.class)

)

WITH CHECK OPTION;

8.

CREATE OR REPLACE VIEW a8 AS

SELECT ship, battle,d.date\_fought

FROM Outcomes O,Battles d

WHERE NOT EXISTS (

SELECT \*

FROM Ships S, Battles B

WHERE S.name=O.ship AND O.battle=B.name AND

TO\_NUMBER(TO\_CHAR(B.DATE\_FOUGHT,'yyyy')) > TO\_NUMBER(TO\_CHAR((select a.DATE\_FOUGHT from battles a ,outcomes b

where b.result='sunk' and a.name=b.battle), 'yyyy'))

)

WITH CHECK OPTION;