

### 6.3.1

a)

```
SELECT DISTINCT maker
FROM   Product
WHERE  model IN
      (SELECT model
       FROM   PC
       WHERE  speed >= 3.0
      );

SELECT DISTINCT R.maker
FROM   Product R
WHERE  EXISTS
      (SELECT P.model
       FROM   PC P
       WHERE  P.speed >= 3.0
              AND P.model =R.model
      );
```

b)

```
SELECT P1.model
FROM   Printer P1
WHERE  P1.price >= ALL
      (SELECT P2.price
       FROM   Printer P2
      ) ;

SELECT P1.model
FROM   Printer P1
WHERE  P1.price IN
      (SELECT MAX(P2.price)
       FROM   Printer P2
      ) ;
```

c)

```
SELECT L.model
```

```

FROM    Laptop L
WHERE    L.speed < ANY
        (SELECT P.speed
         FROM    PC P
         ) ;

SELECT  L.model
FROM    Laptop L
WHERE    EXISTS
        (SELECT P.speed
         FROM    PC P
         WHERE   P.speed >= L.speed
         ) ;

```

d)

```

SELECT  model
FROM

```

```

        (SELECT model,
            price
        FROM    PC

        UNION

        SELECT model,
            price
        FROM    Laptop

        UNION

        SELECT model,
            price
        FROM    Printer
        ) M1
WHERE  M1.price >= ALL
      (SELECT price
        FROM    PC

        UNION

        SELECT price
        FROM    Laptop

        UNION

        SELECT price
        FROM    Printer
        ) ;

```

(d) - contd --

```
SELECT model
FROM
    (SELECT model,
             price
     FROM   PC

     UNION

     SELECT model,
             price
     FROM   Laptop

     UNION

     SELECT model,
             price
     FROM   Printer
    ) M1
WHERE  M1.price IN
    (SELECT MAX(price)
     FROM
        (SELECT price
         FROM   PC

         UNION

         SELECT price
         FROM   Laptop

         UNION

         SELECT price
```

```
        FROM    Printer
        ) M2
    ) ;
```

e)

```
SELECT  R.maker
FROM    Product R,
        Printer T
WHERE   R.model  =T.model
        AND T.price <= ALL
        (SELECT MIN(price)
         FROM    Printer
        );

SELECT  R.maker
FROM    Product R,
        Printer T1
WHERE   R.model  =T1.model
        AND T1.price IN
        (SELECT MIN(T2.price)
         FROM    Printer T2
        );
```

### 6.3.2

a)

```
SELECT C.country
FROM   Classes C
WHERE  numGuns IN
      (SELECT MAX(numGuns)
       FROM   Classes
       );

SELECT C.country
FROM   Classes C
WHERE  numGuns >= ALL
      (SELECT numGuns
       FROM   Classes
       );
```

b)

```
SELECT DISTINCT C.class
FROM   Classes C,
      Ships S
WHERE  C.class = S.class
      AND EXISTS
      (SELECT ship
       FROM   Outcomes O
       WHERE  O.result='sunk'
              AND O.ship = S.name
       ) ;

SELECT DISTINCT C.class
FROM   Classes C,
      Ships S
WHERE  C.class = S.class
      AND S.name IN
      (SELECT ship
       FROM   Outcomes O
       WHERE  O.result='sunk'
       ) ;
```

c)

```
SELECT S.name
```

```

FROM    Ships S
WHERE   S.class IN
        (SELECT class
         FROM    Classes C
         WHERE   bore=16
        ) ;

SELECT  S.name
FROM    Ships S
WHERE   EXISTS
        (SELECT class
         FROM    Classes C
         WHERE   bore    =16
                AND C.class = S.class
        );

```

d)

```

SELECT  O.battle
FROM    Outcomes O
WHERE   O.ship IN
        (SELECT name
         FROM    Ships S
         WHERE   S.Class = 'Kongo'
        );

SELECT  O.battle
FROM    Outcomes O
WHERE   EXISTS
        (SELECT name
         FROM    Ships S
         WHERE   S.Class = 'Kongo'
                AND S.name = O.ship
        );

```

6.4.6

(a)

```
SELECT  AVG(speed) AS Avg_Speed
FROM    PC ;
```

AVG\_SPEED

```
-----
      2.4846153846153846153846153
```

1 record(s) selected.

(b)

```
SELECT  AVG(speed) AS Avg_Speed
FROM    Laptop
WHERE   price > 1000 ;
```

AVG\_SPEED

```
-----
      1.9983333333333333333333333
```

1 record(s) selected.

(c)

```
SELECT  AVG(P.price) AS Avg_Price
FROM    Product R,
        PC P
WHERE   R.model=P.model
        AND R.maker='A' ;
```

AVG\_PRICE

```
-----
      1195
```

1 record(s) selected.

(d)



```

SELECT  AVG(M.price) AS Avg_Price
FROM
    (SELECT P.price
    FROM    Product R,
           PC P
    WHERE   R.model = P.model
           AND R.maker = 'D'

    UNION ALL

    SELECT  L.price
    FROM    Product R,
           Laptop L
    WHERE   R.model = L.model
           AND R.maker = 'D'
    ) M ;

```

```

AVG_PRICE
-----
      730

```

1 record(s) selected.

```

(e)
SELECT  SPEED,
        AVG(price) AS AVG_PRICE
FROM    PC
GROUP BY speed ;

```

SPEED	AVG_PRICE
1.42	478
1.86	959
2.00	650
2.10	995
2.20	640
2.66	2114
2.80	689
3.06	529
3.20	839

9 record(s) selected.

(f)

```
SELECT R.maker,
       AVG(L.screen) AS Avg_Screen_Size
FROM   Product R,
       Laptop L
WHERE  R.model = L.model
GROUP BY R.maker ;
```

MAKER AVG\_SCREEN\_SIZE

MAKER	AVG_SCREEN_SIZE
A	15.233333333333333333333333333333
B	13.300000000000000000000000000000
E	17.500000000000000000000000000000
F	14.750000000000000000000000000000
G	15.400000000000000000000000000000

5 record(s) selected.

(g)

```
SELECT R.maker
FROM   Product R,
       PC P
WHERE  R.model = P.model
```

```
GROUP BY R.maker
HAVING COUNT(R.model) >=3 ;
```

better:

```
SELECT maker
FROM   Product
WHERE  type='pc'
GROUP BY maker
HAVING COUNT(model) >=3 ;
```

MAKER

-----

A

B

D

E

4 record(s) selected.

(h)

```
SELECT R.maker,
       MAX(P.price) AS Max_Price
FROM   Product R,
       PC P
WHERE  R.model = P.model
GROUP BY R.maker ;
```

MAKER MAX\_PRICE

-----

A 2114

B 1049

C 510

D 770

E 959

5 record(s) selected.

```
(i)
SELECT  speed,
        AVG(price) AS Avg_Price
FROM    PC
WHERE   speed > 2.0
GROUP BY speed ;
```

SPEED	AVG_PRICE
2.10	995
2.20	640
2.66	2114
2.80	689
3.06	529
3.20	839

6 record(s) selected.

#### 6.4.7

(a)

```
SELECT COUNT(C.type) AS NO_Classes
FROM   Classes
WHERE  type = 'bb' ;
```

NO\_CLASSES

-----

6

1 record(s) selected.

(b)

```
SELECT AVG(C.numGuns) AS Avg_Guns
FROM   Classes
WHERE  type = 'bb' ;
```

AVG\_GUNS

-----

9

1 record(s) selected.

(c)

We weight by the number of ships and the answer could be different.

```
SELECT AVG(C.numGuns) AS Avg_Guns
FROM   Classes C
       INNER JOIN Ships S
       ON (C.class = S.class)
WHERE  C.type      = 'bb' ;
```

AVG\_GUNS

-----

9

1 record(s) selected.

(d)

Even though the book mentions that the first ship has the same name as class, we can also calculate answer differently.

```

SELECT  C.class,
        MIN(S.launched) AS First_Launched
FROM    Classes C,
        Ships S
WHERE   C.class = S.class
GROUP BY C.class ;

```

CLASS	FIRST_LAUNCHED
Iowa	1943
Kongo	1913
North Carolina	1941
Renown	1916
Revenge	1916
Tennessee	1920
Yamato	1941

7 record(s) selected.

```

(e)
SELECT  C.class,
        COUNT(O.ship) AS No_Sunk
FROM    Classes C ,
        Outcomes O,
        Ships S
WHERE   C.class = S.class
        AND S.name = O.ship
        AND O.result = 'sunk'

```

```
GROUP BY C.Class ;
```

CLASS	NO_SUNK
Kongo	1

```
1 record(s) selected.
```

#### 6.5.1

(a)

```
INSERT
INTO    Product VALUES
      (
            'C'      ,
            '1100' ,
            'pc'
      ) ;

INSERT
INTO    PC VALUES
      (
            '1100' ,
            3.2    ,
            1024,180,2499
      ) ;
```

(b)

```
INSERT
INTO    Product
SELECT  make      ,
        model+1100,
        'laptop'
FROM    Product
WHERE   type = 'pc' ;

INSERT
INTO    Laptop
SELECT  model+1100,
        speed      ,
        ram        ,
        hd         ,
        17         ,
        price+500
FROM    PC ;
```

Or if model is character data type

```
INSERT
INTO    Product
```



```

SELECT  make
        ,
        CHAR( INT(model)+1100) ,
        'laptop'
FROM    Product
WHERE   type = 'pc' ;
INSERT
INTO    Laptop
SELECT  CHAR( INT(model)+1100) ,
        speed
        ,
        ram
        ,
        hd
        ,
        17
        ,
        price+500
FROM    PC ;

```

```

(c)
DELETE
FROM    PC
WHERE   hd < 100 ;

```

```

(d)

DELETE
FROM    Laptop L
WHERE   L.model IN
        (SELECT R2.model
         FROM    Product R2
         WHERE   R2.make IN
                 (SELECT DISTINCT R.make

```

```

        FROM    Product R
        WHERE    R maker NOT IN
                (SELECT R2.maker
                 FROM    Product R2
                 WHERE    R2.type = 'printer'
                )
    )
) ;

DELETE
FROM    PRODUCT R3
WHERE    R3.model IN
        (SELECT R2.model
         FROM    Product R2
         WHERE    R2.maker IN
                (SELECT DISTINCT R.maker
                 FROM    Product R
                 WHERE    R maker NOT IN
                        (SELECT R2.maker
                         FROM    Product R2
                         WHERE    R2.type = 'printer'
                        )
                )
        )
AND R3.type = 'laptop';

```

(e)

```

UPDATE Product
SET    maker = 'A'
WHERE  maker = 'B' ;

```

(f)

```

UPDATE PC
SET    ram = ram*2,
       hd  =hd  +60 ;

```

(g)

```

UPDATE Laptop L
SET    L.screen = L.screen+1,
       L.price  =L.price  -100
WHERE  L.model   IN
        (SELECT R.model
         FROM    Product R
         WHERE    R.maker = 'B'

```

```
) ;
```

#### 6.5.2

(a)

```
INSERT
INTO   Classes VALUES
(
    'Nelson'      ,
    'bb'          ,
    'Gt. Britain',
    9,16,34000
) ;
```

```
INSERT
INTO   Ships VALUES
(
    'Nelson',
    'Nelson',
    1927
) ;
```

```
INSERT
INTO   Ships VALUES
(
    'Rodney',
    'Nelson',
    1927
) ;
```

(b)

```
INSERT
INTO   Classes VALUES
(
    'Vittorio Veneto',
    'bb'              ,
    'Italy'           ,
    9,15,41000
) ;
```

```
INSERT
INTO   Ships VALUES
(
    'Vittorio Veneto',
    'Vittorio Veneto',
    1940
)
```

```

);
INSERT
INTO   Ships VALUES
(
    'Italia'      ,
    'Vittorio Veneto',
    1940
);
INSERT
INTO   Ships VALUES
(
    'Roma'        ,
    'Vittorio Veneto',
    1940
);

```

```

(c)
DELETE
FROM   Ships S
WHERE  S.name IN
      (SELECT ship
       FROM   Outcomes
       WHERE  result='sunk'
      ) ;

```

```

(d)
UPDATE Classes
SET    bore      =2.5      *bore,
      displacement=displacement/1.1 ;

```

```

(e)
DELETE
FROM   Classes C
WHERE  C.class IN
      (SELECT C2.class
       FROM   Classes C2,

```

```
        Ships S
WHERE   C2.class = S.Class
GROUP BY C2.class
HAVING COUNT(C2.class) < 3
) ;
```