以下的數據庫檔 STUDENT 貯存了學生數據如下：

STUDENT

欄名	類型	欄寬	內容
id	字符	4	學生編號
name	字符	10	學生名字
dob	日期	8	出生日期
gender	字符	1	性別： M / F
class	字符	2	班別
house	字符	1	社名： R, Y, B, G
district	字符	3	地區碼
mtest	數字	2	數學測驗分數
remission	binary	1	學費減免

1. [一般語法]

(a) 列出 2A 班學生。

(b) 列出綠社女社員的班別及姓名。

(c) 列出 1B 班男生的名字及數學科測驗成績。

(d) 列出藍社社員名字及居住地區。

(e) 列出所有居住於旺角(MKK) 的紅社男社員名字。

(f) 列出於星期一出生的 2B 班男生名字。

(g) 列出 2B 班女生的名字及出生月份。

一般語法	SELECT [ALL / DISTINCT] *, AS ... FROM ... WHERE ...
比較	[NOT] IN, BETWEEN, [NOT] LIKE "% _"
群組	GROUP BY, HAVING
函數(群組)	COUNT( ), SUM( ), AVG( ), MAX( ), MIN( )
顯示次序	ORDER BY, ASC / DESC
邏輯運算符	AND, OR, NOT
建立/刪除表格	CREATE TABLE ... [AS SELECT ...], DROP TABLE ...
插入/刪除紀錄	INSERT INTO ... VALUES (...), DELETE FROM ... WHERE ...
更新紀錄	UPDATE ... SET field1=newValue, ...
其他	UNION(聯合), LEFT OUTER JOIN ... ON ...

2. [比較]

(a) 列出以下學生的班別及名字：
  (i) 其名字是以 "M" 為起首，
  (ii) 其名字是以 "a" 為結尾，
  (iii) 其名字的第三個字母為 "e"，
  (iv) 其名字是以 "S" 為起首並以 "y" 為結尾，
  (v) 其名字是以 "T" 為起首但不包含 "y"。

(b) 列出 1A 班學生名字及其數學科測驗成績：
  (i) 其分數界乎於 60 至 70 之間，
  (ii) 其分數不是一個平方數(不是：1, 4, 9, 16, ...)，
  (iii) 其分數不是 51, 61, 71, 81, 或 91。

(c) 列出所有並不居住於紅磡 (HHM) 的中一女生的名字。

(d) 列出所有並不在 96年3月22日至 96年4月21日出生的學生名字。

3. [群組] group by

(a) (i) 列出居住於油麻地 (YMT) 的學生人數。
  (ii) 列出居每區的女學生人數。

(b) 列出每班數學測驗合格的人數 (合格分 = 50)。

(c) 列出女生的數目：
  (i) 全校， (ii) 依照 *class* 來群組，
  (iii) 依照*年級*來群組， (iv) 依照*出生年份*來群組。

(d) 列出每區享有學費減免的學生人數。

(e) 查看有沒有兩個學生的名字是相同的。列出所有名字相同的學生。

(f) 列出中一學生的平均歲數。

*以下題目與**顯示次序**有關：*

(g) 在一組數據中，*差距* (range) 定義為： (差距 = 最大值 – 最小值)
  (i) 列出每班數學科測驗成績的差距，並按差距的升冪排列。
  (ii) 列出每班女生數學科測驗成績的差距，並按班別序排列。

(h) 在一組數據中，*控制平均值*(CAVG) 的定義是，撇除最高和最低的各一個數據後，剩下的數據的平均值。(即 n 個數據中只計算 n–2 個)
  (i) 列出每班數學測驗分數的 CAVG，並按班別序排列。
  (ii) 列出每社中一男生數學測驗分數的 CAVG，並按 CAVG 排列。

4. [顯示次序]

(a) 列出所有中二男生的名單，並按班別及姓名序排列。

(b) 列出每社的男(女)社員數目，並按社的次序排列。

(c) 列出享有學費減免的學生名單，並按班別及姓名序排列。

(d) 列出紅社社員的名單，並按性別(男生先排)，班別及姓名序排列。

(e) 列出每班男生和女生的數學測驗平均分，並按班別序排列。

5. [輸出]

(a) 按社員的班別及名字的次序，把藍社社員的資料列印出來。

(b) 把居住於尖沙咀 (TST) 的學生名字列印出來。

(c) 把中一數學測驗不合格的學生名字列印出來。

(d) 把所有中二學生的編號、姓名和班別，按班別及姓名序，貯存成一數據庫檔 NAME。

(e) 把所有學生的姓名和出生日期，按出生日期序，貯存成一數據庫檔 DOB。

6. [二重查詢] * 較難

(a) 列出 1A 班數學科測驗，取得最高分數的學生(可多於一位)的名字、編號及所得分數。

(b) 列出所有學生的名字及班別，其數學科測驗所得分數，比他的班平均值高出至少 10。

(c) 列出中二年級每一班女生數目佔該班的人數百分比。

7. [數據庫聯合、相交及差分]

數據庫檔 PHY、CHEM 和 BIO
分別貯存物理學會、化學學會及生物學會的資料。這三檔有以下的共同結構：

PHY / CHEM / BIO

欄名	類型	欄寬	內容
id	數字	4	學生編號
name	字符	10	學生名字
gender	字符	1	性別： M / F
class	字符	2	班別

(a) 列出化學學會和生物學會的聯合。
(b) 列出物理學會和化學學會的男生的聯合。
(c) 列出物理學會和化學學會的共同會員。
(d) 列出三會的共同會員。
(e) 在化學學會和生物學會的共同會員中，找出不屬於物理學會的會員。

(f) 列出只屬於生物學會的會員。

*以下題目與**自然接合和外接合**有關：*

使用這三個學會的會員資料，並使用數據庫檔 STUDENT 回答：

(g) 列出化學學會中 1A 班的會員名字。

(h) 列出物理學會中女會員名字。

(i) 列出這三個學會都參加了的 2A 班學生的名字。

(j) 列出這三個學會都沒有參加的男生的名字。

8. [自然接合和外接合]

數據庫檔 SWIM 貯存參加學校水運會的中一學生資料。(須與STUDENT一合併使用)

SWIM

欄名	類型	欄寬	內容
Id	數字	4	學生編號
event	字符	10	比賽項目

(a) 把參加水運會的學生名單，按比賽項目、班別及學生名字序列印。

(b) 把參加水運會的 1A 班學生名字及比賽項目，按名字序列印。

(c) 按班別及名字序，列出參加水運會的女生名單。

(d) 按班別及名字序，列出參加自由式項目(Free Style)的男生名單。

(e) 列出參加自由式項目(Free Style)的藍社男社員名單。

(f) 列出每項比賽項目的人數。

(g) 列出每社參加比賽的人數。

(h) 按班別及名字序，列出沒有參加水運會比賽的中一學生名單。

(i) 按班別及名字序，列印一份水運會比賽名單。名單須包括社名及所參加的項目，沒有參加比賽的學生則以 "*******" 表示。

(j) 列出所有參加兩項或以上比賽項目的學生的班別及名字。[使用群組]

(k) 列出背泳項目(Back Stroke)及自由式項目(Free Style)兩式都有參加的學生的班別及名字。

(l) 按社及學生名字序，列出參加水運會其他項目但沒有參加 50m背泳(50m Back Stroke) 的男生名單。

cia (name 國家, region 地區, area 面積, population 人口, gdp 國民生產總值)

1

a Show the name, region and population of all countries.列出所有國家、地區、人口

b Give the name and the per capita GDP for those countries with a population of at least 200 million. 列出人口至少 $2x10^8$ 的國家名稱、人均收入(=GDP/人口)

c Show the name and population (in millions10^6) for the countries of 'South America' 列出所有南美國家的名稱、及人口 (以百萬為位)

d Show the population for 'France', 'Germany' & 'Italy' 列出法國、德國、義大利的人口

e Identify the countries whose names include the word 'United'. 名稱包含 United 的國家

f Which countries have populations larger than 'United States'? 哪些國家人口比美國多

g List the regions that contain 'Iraq' or 'Iran' 以上國家屬哪些地區?

h List all details of countries in the regions containing 'Iraq' or 'Iran'
列出以上國家所屬地區內的所有國家及其資料

i Show the European countries with a per capita GDP greater than that of 'United Kingdom' 有哪些歐洲國家的人均收入，要比英國多?

j Which country has a population that is more than Kenya but less than Canada?
哪些國家的人口比肯雅少，但比加拿大多?

k Which countries have a GDP greater than ANY European country?
哪些國家的總收入，比任何一個歐洲國家還要多?

l Find the largest country in each region. 列出每個地區，面積最大的國家名稱

m Find the region in which all countries have a population of less than 1
哪個地區，區內的所有國家人口均少於 1?

n* Some countries have populations at least three times
that of any of their neighbors (in the same region). Give the countries and regions.
有些國家的人口，是同區任何國家的人口至少 3 倍，試列出國家名稱、及所屬地區。

o The names and population densities for the very large countries (over $3x10^6$)
哪些國家的面積大於 $3x10^6$，列出名稱、人口密度(人口/面積)

p Find those very small (less than $4x10^5$) but very rich (GDP over 10^{12}) countries.
找出所有面積少於 $4x10^5$，但非常富有(GDP 多於 10^{12})的國家

q Which of following is/are country name(s)? Ceylon, Iran, Persia and Sri Lanka
以上哪些名字是國家名稱?

r What are the countries beginning with 'D'? 哪些國家的名稱是以'D'字開頭?

s Which countries are not too small and not too big ($4x10^5$−$3x10^6$)? 面積中等的國家

2 Aggregate 總結性 functions 函數 such as COUNT, SUM, MAX, MIN and AVG

a Show the total population of the world. 全球總人口多少?

b List all the regions without repetition. 列出所有地區名稱 (不可重複)
How many regions are there? 共有多少個地區?

c List the countries with GDP greater than the whole of Africa
哪些國家的 GDP 大於所有非洲國家的 GDP 總和?

d For each region, show the region and number of countries. 地區及區內有多少國家

d_2* Find the largest and the 2nd largest countries (with areas) of each region.
列出地區名稱、及區內面積最大的 2 個國家 (必須顯示面積)

e For each region, show the region and number of countries with populations of at least 10 million (10^7). 每個地區，人口至少 10^7 的有國家多少?

f List the regions with total populations of at least 100 million (10^8).
哪些地區的總人口至少有 10^8，列出地區名稱及總人口

g The total population and GDP of Europe. 歐洲的總人口 及 GDP

h Show the large countries (over $3x10^6$) in descending order of population.
列出面積大於 $3x10^6$ 的國家，按人口(由大至小)排列

i The regions with total populations and areas, sorted by population.
列出每地區的總人口、及總面積，按人口排列

j The regions with total populations and areas, sorted by population. 同上，
Include only those regions with names that include 'America'. 但只顯示美洲國家

k Show the countries with area smaller than 'United Kingdom'
but with larger population than UK. 哪些國家面積比 UK 小，但人口卻比 UK 多?

l. How many regions are there? 全球共分多少個地區?

3 (ACME accounts) Invoices and receipts 發票、收據

table: customer 顧客資料

cust_id	cust_name	cust_addr
C001	Wile E Coyote	www.hotmail.com
C002	Sylvester	www.warnerbros.com
C003	Tom Brown	www.mgmt.com
C004	Elmer Fudd	www.yahoo.com
C005	Dick Dastardly	www.email.com

table: product 產品編號、名稱、單價

prod_code	description 產品名稱	unit_price
P001	Anvil	75
P002	Portable holes	5
P003	Horseshoe magnet	80
P004	TNT	50
P005	Bomb	50
P006	Elastic band	2
P007	Rocket roller skates	80
P008	Space ship	60000000
P009	Road sign "Diversion Left"	30
P010	Road sign "Diversion Right"	30

table: shipped 貨物付運

cust_id	ship_date	prod_code	quantity
C001	10-Jul-98	P003	1
C001	22-Jul-98	P004	2
C001	22-Jul-98	P005	12
C001	23-Jul-98	P005	12
C001	23-Jul-98	P006	1
C001	23-Jul-98	P007	1
C005	01-Jan-98	P008	1

table: receipt 收據

cust_id	rec_date	pay_term	amount
C001	15-Jul-98	Cheque	80
C001	23-Jul-98	Cash	700
C005	10-Feb-98	DD	5
C005	10-Mar-98	DD	5
C005	10-Apr-98	DD	5
C005	10-May-98	DD	5
C005	10-Jun-98	DD	5
C005	10-Jul-98	DD	5

a How many customers are listed on the database? 數據庫中有多少個顧客?

b Identify customers 'C001', 'C005' 顧客名稱

c Identify products 'P001', 'P007' 產品名稱

d How many receipts are on the system? 數據庫中有多少張收據?

e View the payments made by customer 'C001' 顧客'C001' 的付款情況

f View the shipments made to customer 'C001' by date order 顧客的貨物付運情況

g Prepare a list of all items purchased by customer 'C001'. Show the date, the product description, the unit price, the quantity shipped and the total value (quantity * price). 顧客'C001' 訂購產品清單 (包括：日期、產品名稱、單價、數量、總值)

h Calculate the total value of all items shipped to customer 'C001' on '23-JUL-1998'. 顧客'C001' 在'23-JUL-1998'的訂單總值多少

i Prepare a shipping statement 貨物付運單 for customer 'C001' it should show the date, the legend 'Delivery' and the total value of the products shipped on each day. 必須顯示每日付運貨品總值

j Prepare a receipts statement 收據 for customer 'C001' it should show the date, the notes(pay-term 付款方式) and the amount received 收到款項.

k Use the UNION command to prepare a full statement 單據 for customer 'C001'. It should be laid out 如下顯示 as follows. (Note that the values shown below are not correct.) You may be able to use '' or NULL for blank values - if necessary use 0.

10-JUL-1998	Delivery	100.00
15-JUL-1998	Cheque	100.00
22-JUL-1998	Delivery	210.00
23-JUL-1998	Delivery	45.00
23-JUL-1998	Cash	255.00

l Create a list showing the outstanding balance 結餘 for each customer 顧客.

4 Edinburgh Buses 愛丁堡巴士路線

Self-Join

f. Give a list of all the services which connect stops 115 and 191. ('Haymarket' & 'Portabello') 哪些巴士線會經過(連接)以下兩站 115,191?

g. Give a list of the services which connect the stops 'Craiglockhart' and 'Tollcross' 哪些巴士線會經過(連接)以下兩站'Craiglockhart' and 'Tollcross'?

h. Give a list of the stops which may be reached from 'Craiglockhart' by taking one bus. Include the details of the appropriate service.
由 'Craiglockhart' 出發，若只乘一輛巴士(不轉車)，可以到達哪些巴士站? 請同時列出巴士服務資料。

i. Show how it is possible to get from Sighthill to Craiglockhart.
顯示如何由 Sighthill 乘巴士到達 Craiglockhart?

You might intersect all the places from Craiglockhart with all the places from Sighthill. This would at least be a start.

SQL exercise with solutions (to be run on MySQL)

欄位		ships (國家,戰艦)	battle (戰役,戰艦,狀態)
國家:	O,W,X,Y,Z	create table ships(	create table battle (
戰艦:	shipA,shipB,...	Countrychar(1),	Battle char(2),
戰役:	B1,B2,B3,B4	Ship char(5)	Ship char(5),
狀態:	良好 OK	);	Status char(7)
	損毀 Damaged		);
	沉沒 Sunk		

Write SQL statements for the following queries: 寫 SQL 語句，執行以下查詢

```
insert into ships values
("W","shipJ"), ("W","shipK"), ("W","shipM"), ("W","shipN"), ("X","shipA"),
("X","shipB"), ("X","shipC"), ("X","shipD"), ("Y","shipP"), ("Y","shipQ"),
("Y","shipR"), ("Y","shipS"), ("Y","shipT"), ("Z","shipE"), ("Z","shipF"),
("Z","shipG"), ("Z","shipH"), ("O","shipO");

insert into battle values
("B1","shipA","s"), ("B1","shipB","d"), ("B1","shipC","ok"), ("B1","shipD","d"),
("B1","shipP","s"), ("B1","shipQ","d"), ("B1","shipS","s"), ("B1","shipT","d"),
("B2","shipP","d"), ("B2","shipQ","s"), ("B2","shipR","ok"), ("B2","shipS","d"),
("B2","shipT","s"), ("B2","shipF","s"), ("B2","shipG","s"), ("B2","shipH","d"),
("B3","shipA","d"), ("B3","shipB","s"), ("B3","shipC","d"), ("B3","shipD","s"),
("B3","shipQ","s"), ("B3","shipR","s"), ("B3","shipS","s"), ("B3","shipT","s"),
("B3","shipE","ok"), ("B3","shipF","d"), ("B3","shipG","s"), ("B3","shipH","ok"),
("B4","shipA","ok"), ("B4","shipB","s"), ("B4","shipC","s"), ("B4","shipD","d"),
("B4","shipE","s"), ("B4","shipF","d"), ("B4","shipG","ok"), ("B4","shipH","ok");

update battle set status="OK" where status="ok";
update battle set status="Damaged" where status="d";
update battle set status="Sunk" where status="s";
```

(1) total number of ships involved in each battle 每場戰役中，參與戰艦數目

battle	count(*)
B1	8
B2	8
B3	12
B4	8

(2) number of ships involved in each battle for each country
每場戰役中，每個參與國家名稱，及戰艦數目

battle	country	nShips
B1	X	4
B1	Y	4
B2	Y	5
B2	Z	3
B3	X	4
B3	Y	4
B3	Z	4
B4	X	4
B4	Z	4

(3) number of countries involved in each battle 每場戰役中，參與國家數目

battle	nCountry
B1	2
B2	2
B3	3
B4	2

(4) count the no.of sunk, damaged & survived ships for each country in different battles 每場戰役中，參與國家的每艘戰艦 狀況及數目

battle	country	status	count(*)	battle	country	status	count(*)
B1	X	Damaged	2	B3	X	Sunk	2
B1	X	OK	1	B3	Y	Sunk	4
B1	X	Sunk	1	B3	Z	Damaged	1
B1	Y	Damaged	2	B3	Z	OK	2
B1	Y	Sunk	2	B3	Z	Sunk	1
B2	Y	Damaged	2	B4	X	Damaged	1
B2	Y	OK	1	B4	X	OK	1
B2	Y	Sunk	2	B4	X	Sunk	2
B2	Z	Damaged	1	B4	Z	Damaged	1
B2	Z	Sunk	2	B4	Z	OK	2
B3	X	Damaged	2	B4	Z	Sunk	1

(5) which country has not involved in any battle 沒有參與任何戰役的國家 (W,O)

(6) total number of ships sunk (not sunk) in each battle
每個戰役，沉沒船隻的總數

battle	nSunk
B1	3
B2	4
B3	7
B4	3

(7) number of battles involved for each country (1+,0+) 每個國家參與戰役的數目

country	nBattles
X	3
Y	3
Z	3
O	0
W	0

(8) total number of ships sunk (not sunk) for each country in each battle
每個戰役，每個國家，沉沒船隻的總數

battle	country	nSunk
B1	X	1
B1	Y	2
B2	Y	2
B2	Z	2
B3	X	2
B3	Y	4
B3	Z	1
B4	X	2
B4	Z	1

(9) name of ships which have never sunk in any battle
從未在任何戰役中，沉沒船隻的名稱 (shipH)

(10) the countries of which some ships have not sunk in battle "B3"
哪些國家，在任何戰役中，有至少一艘船隻，沒有沉沒? (Y,Z)

(11) name of ships which sank in each battle 每個戰役，沉沒船隻的名稱

battle	country	ship	nSunk
B1	X	shipA	1
B3	X	shipB	2
B4	X	shipC	1
B3	X	shipD	1
B1	Y	shipP	1
B2	Y	shipQ	2
B3	Y	shipR	1
B1	Y	shipS	2
B2	Y	shipT	2
B4	Z	shipE	1
B2	Z	shipF	1
B2	Z	shipG	2

(12) the country of which all ships have sunk in battle "B3"
哪些國家，在戰役 B3 中，全部船隻沉沒? (Y)

(13) find the total (average) score of each country in each battle 計算總分

* according to the following rules: 遊戲規則
* 2 points 良好 OK
* 1 point 損毀 Damaged
* 0 point 沉沒 Sunk

country	battle	total
X	B1	4
X	B3	2
X	B4	3
Y	B1	2
Y	B2	4
Y	B3	0
Z	B2	1
Z	B3	5
Z	B4	5

Tables:
水手Sailors (sid, sname, rating, age)
預訂Reserves (sid, bid, day)
船隻Boats (bid, bname, color)

Sailors水手

SID	SNAME	RATING	AGE
10	Dustin	1	45
29	Brutus	1	33
85	Art	3	25.5
95	Bob	3	63.3
96	Frodo	3	25.5
22	Dustin	7	45
64	Horatio	7	35
31	Lubber	8	55.5
32	Andy	8	25.5
74	Horatio	9	35
71	Zorba	10	16
58	Rusty	10	35

Reserves預訂

SID	BID	DAY
64	101	2010-10-1
22	101	2010-10-2
22	102	2010-10-3
31	102	2010-10-4
64	102	2010-10-5
31	103	2010-10-6
22	103	2010-10-7
74	103	2010-10-8
31	104	2010-10-9
22	104	2010-10-10
水手	船隻	預訂日期

Boats船隻

BID	BNAME	COLOR
101	Interlake	blue
102	Interlake	red
103	Clipper	green
104	Marine	red

```
// drop tables if exist.
drop table Sailors;
drop table Reserves;
drop table Boats;

// create tables
create table Sailors(
    sid int not null primary key,
    sname varchar(20),
    rating  int,
    age     decimal(4,1)
);

create table Boats(
    bid int not null primary key,
    bname varchar(20),
    color   varchar(20)
);
```

```
預訂
create table Reserves(
    sid int,
    bid int,
    day     date,
    primary key (sid,bid,day),

    foreign key (sid)
        references Sailors(sid)
        ON DELETE CASCADE,
    foreign key (bid)
        references Boats(bid)
        ON DELETE CASCADE
);
```

```
insert into Sailors values
(22,'Dustin',7,45.0),
(29,'Brutus',1,33.0),
(31,'Lubber',8,55.5),
(32,'Andy',8,25.5),
(58,'Rusty',10,35.0),
(64,'Horatio',7,35.0),
(71,'Zorba',10,16.0),
(74,'Horatio',9,35.0),
(85,'Art',3,25.5),
(95,'Bob',3,63.5);
```

```
insert into Boats values
(101,'Interlake','blue'),
(102,'Interlake','red'),
(103,'Clipper','green'),
(104,'Marine','red'),
(109,'HKSAR','pink');
```

```
insert into Reserves
values
(22,101,'2010-10-1'),
(22,102,'2010-10-2'),
(22,103,'2010-10-3'),
(22,104,'2010-10-4'),
(31,102,'2010-10-5'),
(31,103,'2010-10-6'),
(31,104,'2010-10-7'),
(64,101,'2010-10-8'),
(64,102,'2010-10-9'),
(74,103,'2010-10-10');
```

Exercises:

1) "Find all sailors with a rating above 7" 所有水手(rating高於7)

2) "Find sailor name, boat id and date for each reservation" 船隻預訂紀錄

3) "Find the names and ages of all sailors" 所有水手姓名、年齡

4) Find the names of sailors that are 30 or older 所有水手姓名(年齡 30 或以上)

5) Find the names of boats that have been reserved on 01/10/2010 在某天有哪些預訂船隻(名稱)

6) "Find the sid of sailors who have reserved a red boat" 曾預訂紅色船隻

7) sailors whose name begins and ends with B and has at least 3 characters 所有水手姓名(至少3英文字母,以B開始及結束)

8) "Find the average age of all sailors" 水手平均年齡

9) "Find the average age of sailors with a rating of 10"

10) Find duplicate sailor names 找出姓名相同的水手

11) Find for each boat, the total no of reservations 計算每艘船的預訂總數
(a) show boat id (b) show boat name

12) Find for each boat name, the no of different sailors that reserved it 計算每艘船曾被多少個不同的水手預訂

13) Find for each boat, the no of different sailors that reserved it on 01/10/2010 (同上,在某天)

14) "Find the sid & names of sailors who have reserved boat number 103"
// 那些水手曾預訂boat#103: 22,31,74

15) "Find the names of sailors who have never reserved boat number 103"
// 那些水手從未預訂boat#103: 29,32,58,64,71,85,95

16) "Find the names of sailors who have reserved a red boat"
// 那些水手曾預訂red boat: Dustin, Lubber, Horatio

17) "Find the colors of boats reserved by Lubber" 他曾預訂過船隻的顏色
// red, green

18) "Find the names of sailors who have reserved at least one boat"
// 那些水手曾預訂過船隻: Dustin, Lubber, Horatio

19) "Find the names of sailors who have reserved a red or a green boat"
// 那些水手曾預訂過船隻(red or green): Dustin, Lubber, Horatio

20) "Find the names of sailors who have reserved both red and green boat"
// 那些水手曾預訂過船隻(red and green): Dustin, Lubber

21) "sid of sailors with age over 20 who have not reserved a red boat"
// 年齡>20,從未預訂過 red boat: Brutus, Andy, Rusty, Horatio(74), Art, Bob

22) "names of sailors who have reserved at least two different boats"
// 至少預訂過2隻不同船隻: Dustin, Lubber, Horatio

23) "Find sid of all sailors who have reserved green but not red boats" 只預訂過 green boat, 但未預訂過red boat: 顯示 sid

24) "Find the names of sailors who have reserved green but not red boat"
// 只預訂過green boat, 但未預訂過red boat: 顯示水手姓名 Horatio

// Q20 "Find sid of sailors who have a rating of 10 or have reserved boat 104"

25) "Find the sid and names of sailors who have not reserved a red boat" 從未預訂過 red boat:

26) "Find sailors whose rating is greater than ____ sailor called Horatio"
// rating 大於 (a) 任何一個 (b) 所有 名叫Horatio的水手
(a) some/any 任何一個 (>min) (b) every/all 所有 (>max)

27) "Find the sailors with the highest rating" 最高rating的水手

28) "Find the name and age of the oldest sailor" 最年長的水手

29) "Count the number of sailors" 水手的總人數

30) "Count the number of different sailor names" 水手姓名的總數 (不可重複)

31) Find boats NOT reserved by the sailor with sid=31. 水手#31 未租過的船隻

32) "Find the names of sailors who are older than the oldest sailor with a rating of 10" 那些水手比 (rating10中最年長的水手) 更年長

33) "Find the age of the youngest sailor for each rating level"
每rating組別中, 最年輕的水手

34) "Find the age of the youngest sailor who is eligible to vote (age>=18) // for each rating level with at least 2 such sailors" 每rating組別中, 超過18而最年輕的水手, 每組別必須有至少2人

35) "Find the no of reservations for each red boat" 每艘red boat的預訂次數

36) "Find ___ age of sailors for each rating level that has at least 2 sailors"每rating組別中, 水手的 (a)平均年齡 (b)最高年齡, 每組別必須有至少2人
(a) average (b) maximum

37) For each boat, identify sid the of sailor who made the highest no of reservations. 每一艘船, 預訂次數最多的水手及次數

```
insert into Reserves values
    (64,101,'2010-11-1'), (64,102,'2010-11-2'),
    (31,103,'2010-11-3'), (31,104,'2010-11-4');
```

38) Identify the boat with most reservations. 那艘船的預訂次數最多

39) For each boat, find the number of times it has been reserved; including those boats that have never been reserved (list boat id and name).
每一艘船(包括沒有預訂的船隻) 的預訂次數

40) Identify all sailors who have never reserved a red boat.
哪些水手從未預訂過red boat. NOT(22,31,64)

41) Find the sailors who have at least 10 reservations for red boats.
哪些水手至少預訂過10次red boat