# 進階資料庫實務

## Class 4 – 進階查詢功能

授課教師：戚祐寧

# 想一想？

我們已經可以透過查詢語法，可以知道班級資料表內所有資料，但我們該如何解讀裡面的資料呢？



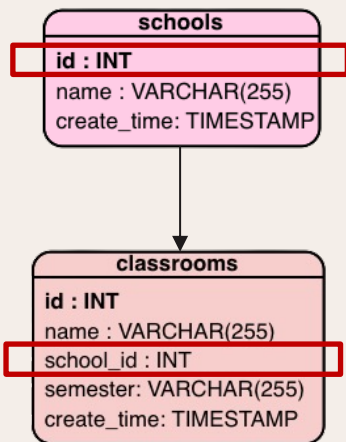school_id 編號 1 是哪間學校？

# 將資料表合起來



| schools |
|---|
| id : INT |
| name : VARCHAR(255) |
| create_time: TIMESTAMP |

| classrooms |
|---|
| id : INT |
| name : VARCHAR(255) |
| school_id : INT |
| semester: VARCHAR(255) |
| create_time: TIMESTAMP |

| semestar | school_name | classroom_name |
|---|---|---|
| 111 | 臺北市立建國高級中學 | 101 |
| 111 | 臺北市立第一女子高級中學 | 101 |

# 將資料表合起來



SELECT classrooms.semester, schools.name AS school_name, classrooms.name AS classroom_name
FROM `db`.`schools`, `db`.`classrooms`
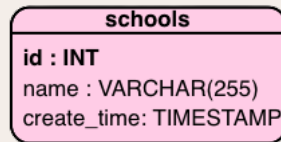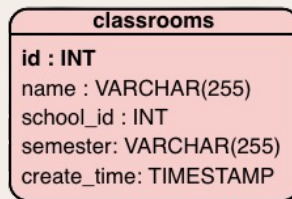WHERE schools.id = classrooms.school_id;

別名                                別名

# 練習 1

列出每位學生所屬的學校與班級，如下表：

| semestar | school_name | classroom_name | student_name |
|----------|-------------|----------------|--------------|
| 110 | 臺北市立建國高級中學 | 101 | 吳宇翔 |
| 110 | 臺北市立第一女子高級中學 | 101 | 吳明惠 |



**members**
id : INT
name : VARCHAR(255)
sex: VARCHAR(255)
role: VARCHAR(255)
create_time: TIMESTAMP

**member_classroom**
id : INT
member_id: INT
classroom_id: INT
create_time: TIMESTAMP

**classrooms**
id : INT
name : VARCHAR(255)
school_id : INT
semester: VARCHAR(255)
create_time: TIMESTAMP

**schools**
id : INT
name : VARCHAR(255)
create_time: TIMESTAMP
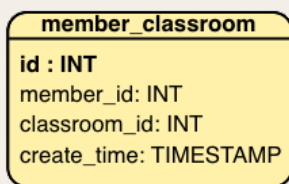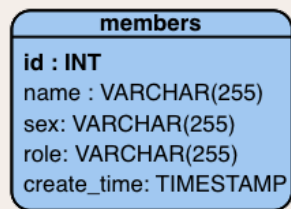
# 練習 1

列出每位學生所屬的學校與班級



```
1  SELECT classrooms.semester, schools.name AS school_name, classrooms.name AS classroom_name, members.name AS member_name
2  FROM `db`.`schools`, `db`.`classrooms`, `db`.`members`, `db`.`member_classroom`
3  WHERE schools.id = classrooms.school_id AND
4  member_classroom.member_id = members.id AND
5  member_classroom.classroom_id = classrooms.id AND
6  members.role = '學生';
```

SELECT
classrooms.semester,
schools.name AS school_name,
classrooms.name AS classroom_name,
members.name AS member_name

FROM
`db`.`schools`,
`db`.`classrooms`,
`db`.`members`,
`db`.`member_classroom`

WHERE
schools.id = classrooms.school_id AND
member_classroom.member_id = members.id AND
member_classroom.classroom_id = classrooms.id AND
members.role = '學生';

# 練習 2

列出每位學生所屬的學校與班級、並列出每一次考試成績，如下表：

| semestar | school_name | classroom_name | student_name | type | subject | score |
|---|---|---|---|---|---|---|
| 110 | 臺北市立建國高級中學 | 101 | 吳宇翔 | 期末考 | 數學 | 74 |
| 110 | 臺北市立第一女子高級中學 | 101 | 吳明惠 | 期末考 | 英文 | 85 |

# 練習 2

列出每位學生所屬的學校與班級、並列出每一次考試成績，如下表：



SELECT
classrooms.semester,
schools.name AS school_name,
classrooms.name AS classroom_name,
members.name AS member_name,
scores.type,
scores.subject,
scores.score

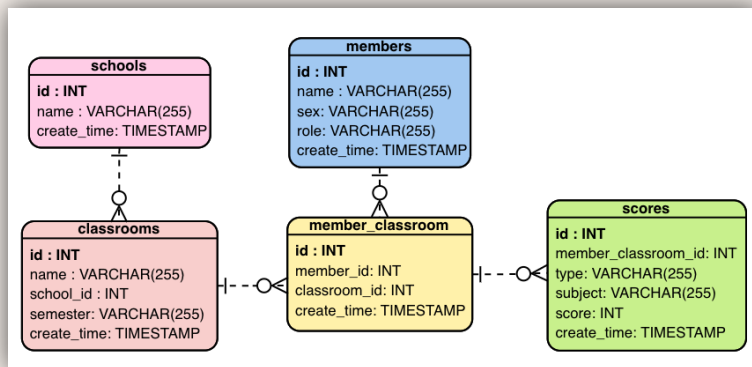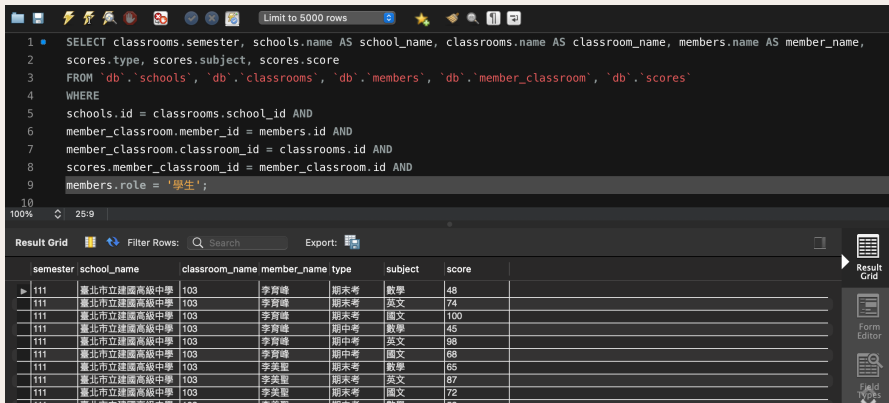FROM `db`.`schools`, `db`.`classrooms`, `db`.`members`,
`db`.`member_classroom`, `db`.`scores`

WHERE
schools.id = classrooms.school_id AND
member_classroom.member_id = members.id AND
member_classroom.classroom_id = classrooms.id AND
scores.member_classroom_id = member_classroom.id AND
members.role = '學生';

# 將欄位合起來

列出每位學生每次考試總分，如下表：

| semestar | school_name | classroom_name | student_name | type | subject | score |
|---|---|---|---|---|---|---|
| 110 | 臺北市立建國高級中學 | 101 | 吳宇翔 | 期末考 | 數學 | 74 |
| 110 | 臺北市立建國高級中學 | 101 | 吳宇翔 | 期末考 | 英文 | 54 |
| 110 | 臺北市立建國高級中學 | 101 | 吳宇翔 | 期末考 | 國文 | 61 |

| semestar | school_name | classroom_name | student_name | type | total |
|---|---|---|---|---|---|
| 110 | 臺北市立建國高級中學 | 101 | 吳宇翔 | 期末考 | 189 |

# 將欄位合起來

列出每位學生每次考試總分，如下表：



※ **SUM** 為內建加總函式，平均為 **AVG**

```
SELECT
classrooms.semester,
schools.name AS school_name,
classrooms.name AS classroom_name,
members.name AS member_name,
scores.type,
SUM(scores.score) AS total

FROM `db`.`schools`, `db`.`classrooms`, `db`.`members`,
`db`.`member_classroom`, `db`.`scores`

WHERE
schools.id = classrooms.school_id AND
member_classroom.member_id = members.id AND
member_classroom.classroom_id = classrooms.id AND
scores.member_classroom_id = member_classroom.id AND
members.role = '學生'

GROUP BY semester, school_name, classroom_name,
member_name, type
```

# 練習 3

列出 110 學年度於『臺北市立內湖高級中學』每位學生總平均 (期中 & 期末)



SELECT
classrooms.semester,
schools.name AS school_name,
classrooms.name AS classroom_name,
members.name AS member_name,
**AVG(scores.score) AS average**

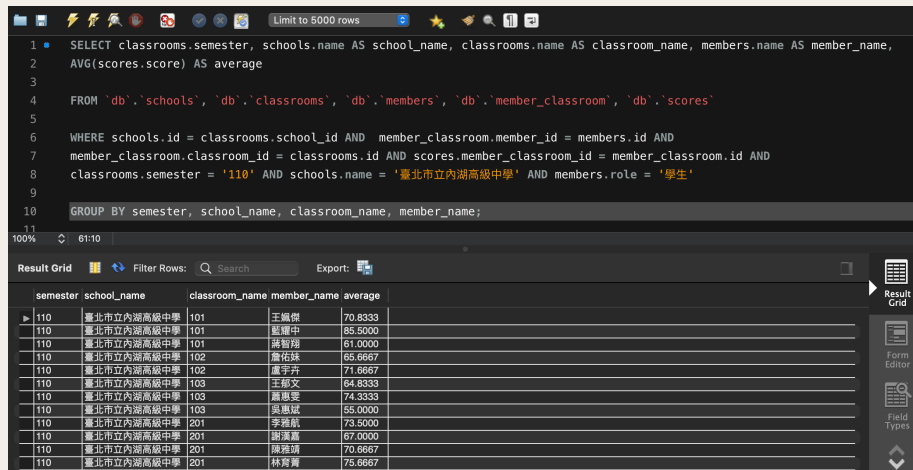FROM `db`.`schools`, `db`.`classrooms`, `db`.`members`, `db`.`member_classroom`, `db`.`scores`

WHERE
schools.id = classrooms.school_id AND
member_classroom.member_id = members.id AND
member_classroom.classroom_id = classrooms.id AND
scores.member_classroom_id = member_classroom.id AND
**classrooms.semester = '110' AND**
**schools.name = '臺北市立內湖高級中學' AND**
members.role = '學生'

**GROUP BY semester, school_name, classroom_name,**
**member_name;**

# 排序

列出 110 學年度於『臺北市立內湖高級中學』各班學生總平均 (按高到低排序)

```
1   SELECT classrooms.semester, schools.name AS school_name, classrooms.name AS classroom_name, members.name AS member_name,
2   AVG(scores.score) AS average
3
4   FROM `db`.`schools`, `db`.`classrooms`, `db`.`members`, `db`.`member_classroom`, `db`.`scores`
5
6   WHERE schools.id = classrooms.school_id AND  member_classroom.member_id = members.id AND
7   member_classroom.classroom_id = classrooms.id AND scores.member_classroom_id = member_classroom.id AND
8   classrooms.semester = '110' AND schools.name = '臺北市立內湖高級中學' AND members.role = '學生'
9
10  GROUP BY semester, school_name, classroom_name, member_name
11
12  ORDER BY classroom_name ASC, average DESC;
13
```

Limit to 5000 rows

100%  43:12

Result Grid    Filter Rows: Search    Export:

| semester | school_name | classroom_name | member_name | average |
|---|---|---|---|---|
| 110 | 臺北市立內湖高級中學 | 101 | 藍耀中 | 85.5000 |
| 110 | 臺北市立內湖高級中學 | 101 | 王孋傑 | 70.8333 |
| 110 | 臺北市立內湖高級中學 | 101 | 蔣智翔 | 61.0000 |
| 110 | 臺北市立內湖高級中學 | 102 | 盧宇卉 | 71.6667 |
| 110 | 臺北市立內湖高級中學 | 102 | 詹佑妹 | 65.6667 |
| 110 | 臺北市立內湖高級中學 | 103 | 蕭惠雯 | 74.3333 |
| 110 | 臺北市立內湖高級中學 | 103 | 王郁文 | 64.8333 |
| 110 | 臺北市立內湖高級中學 | 103 | 吳惠斌 | 55.0000 |
| 110 | 臺北市立內湖高級中學 | 201 | 方介平 | 76.1667 |

Result Grid

Form Editor

**按照平均降序**

↓

ORDER BY classroom_name ASC, average DESC

↑

**按照班級升序**

**※ ASC : 升序 (由小到大)、DESC : 降序 (由大到小)**

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# Summary

- 如何將多張資料表合併

- 如何將欄位 **Group By** 並運用內建函式進行計算

- 欄位 **Order By** 排序 **(ASC DESC)**

# Thanks!