

employee (ID, person_name, street, city)
works (ID, company_name, salary)

Figure 1

- (40%) Use MariaDB to declare the two relations in Figure 1, where the primary keys are underlined.
- (1) For each relational schema, choose an appropriate domain for each attribute. Define the attribute “person_name” as “not null”. Other attributes except primary keys can have null values.
- (2) Declare the primary key of each relation. Note that the primary key of the *works* relation consists of two attributes. After finishing steps (1)-(2), capture the corresponding Web page as the answer. (所抓之圖如 PHP 手冊 (lab23.pdf) 第 19 頁下方之圖).

The screenshot shows two sessions in phpMyAdmin:

Session 1: employee Table

- Table structure:

#	名稱	類型	編碼與排序	屬性	空值(NULL)	預設值	備註	額外資訊	動作
1	<u>ID</u>	int(11)		否	無				修改 刪除 更多
2	person_name	varchar(11)	utf8mb4_general_ci	否	無				修改 刪除 更多
3	street	varchar(11)	utf8mb4_general_ci	是		NULL			修改 刪除 更多
4	city	varchar(11)	utf8mb4_general_ci	是		NULL			修改 刪除 更多
- SQL query: ALTER TABLE `employee` CHANGE `city` `city` VARCHAR(11) NULL DEFAULT NULL;

Session 2: works Table

- Table structure:

#	名稱	類型	編碼與排序	屬性	空值(NULL)	預設值	備註	額外資訊	動作
1	<u>ID</u>	int(11)		否	無				修改 刪除 更多
2	company_name	varchar(11)	utf8mb4_general_ci	否	無				修改 刪除 更多
3	salary	int(11)		是		NULL			修改 刪除 更多
- Index configuration (bottom panel):

動作	鍵名	類型	獨一	緊湊	欄位	基數	編碼與排序	空值(NULL)	備註
重新命名 刪除	PRIMARY	BTREE	是	否	ID	0	A	否	
重新命名 刪除	company_name	BTREE	否	否	company_name	0	A	否	
重新命名 刪除	ID	BTREE	否	否	ID	0	A	否	

- (3) Declare the attribute “ID” of the “works” relation as a foreign key referencing the “employee”

relation. Please choose the option “restrict” for deletion and choose the option “cascade” for update. After declaration, capture the corresponding Web pages as the answers. (所抓之圖如教學手冊第 22 頁最下方之圖)

The screenshot shows the 'works_ibfk_1' foreign key constraint configuration in phpMyAdmin. The 'ON UPDATE' dropdown is set to 'CASCADE' and is highlighted with a red circle.

動作	限制式屬性	欄位	外鍵限制式 (INNODB)
刪除	ON DELETE RESTRICT	ID	資料庫 資料表 欄位
	ON UPDATE CASCADE	figure 1	
		+ 新增欄位	
		employee ID	
ON DELETE	RESTRICT	figure 1	
ON UPDATE	RESTRICT	+ 新增欄位	

- (4) Insert at least five tuples into the two relations, respectively. Capture the corresponding Web pages as the answers. (所抓之圖如教學手冊第 17 頁下方之圖)

The screenshot shows the 'employee' table data in phpMyAdmin. The last five rows are highlighted with a red circle.

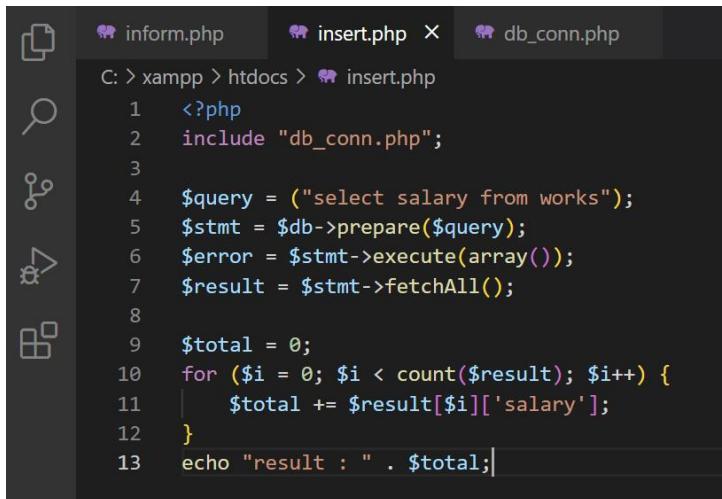
ID	person_name	street	city
1	氣	1A	鹹金族
2	氣	8A	惰性氣體
3	鐸	1A	鹹金族
4	鉀	2A	鹹土族
5	硼	3A	NUL!

The screenshot shows the 'works' table data in phpMyAdmin. The last five rows are highlighted with a red circle.

ID	company_name	salary
1	H	1
2	He	4
3	Li	7
4	Be	9
5	B	11

[學號最末碼為雙數之同學]01057040

2. (60%) Write a PHP program to output the total salary (薪水總和) of employees, by using the loop structure. DO NOT use the aggregate functions in SQL such as “sum”, or similar APIs in PHP. (注意：需用 prepared statement 的寫法，部分程式如教學手冊第 28 頁所示)
- (1) Give the program listing.



```
C: > xampp > htdocs > insert.php
1  <?php
2  include "db_conn.php";
3
4  $query = ("select salary from works");
5  $stmt = $db->prepare($query);
6  $error = $stmt->execute(array());
7  $result = $stmt->fetchAll();
8
9  $total = 0;
10 for ($i = 0; $i < count($result); $i++) {
11     $total += $result[$i]['salary'];
12 }
13 echo "result : " . $total;
```

- (2) Capture the screen which shows the answer based on your database content. (Your answer of Question 1(4).) (注意：畫面必須擷取到網址)



[學號最末碼為單數之同學]

2. (60%) Write a PHP program to show all the content of the “employee” relation for those who live in Taipei. The data should be displayed in a table. (注意：需用 prepared statement 的寫法，部分程式如教學手冊第 33 頁所示)
- (1) Give the program listing.
- (2) Capture the screen which shows the answer based on your database content. (Your answer of Question 1(4).) (注意：畫面必須擷取到網址)

繳交作業方式：

1. Please submit your homework in a single PDF file to TronClass by 12/3 11:59pm.

2. 第2題依學號末碼區分，請同學注意勿答錯題。
3. 注意：若作業答案有一模一樣者，則皆為零分，不論你是不是原始創作者。