# 中正資工**MySQL**服務

- https://mysql.cs.ccu.edu.tw/

- 系上 MySQL，web介面要先從
  https://mysql.cs.ccu.edu.tw/index.php 登錄系上帳號，
  然後再登錄 phpMyAdmin，
  NOTE: 在・FAQ Zone・中有寫
  「Q: 哪些地方的機器能夠使用MySQL Client連接到
  mysql.cs.ccu.edu.tw？
  A: 目前開放資工系以及宿舍區的機器能夠直接連線到本服
  務.」

  command 操作介面要先登錄系上工作站，
  然後打「mysql -h mysql.cs.ccu.edu.tw -u yourID -p」

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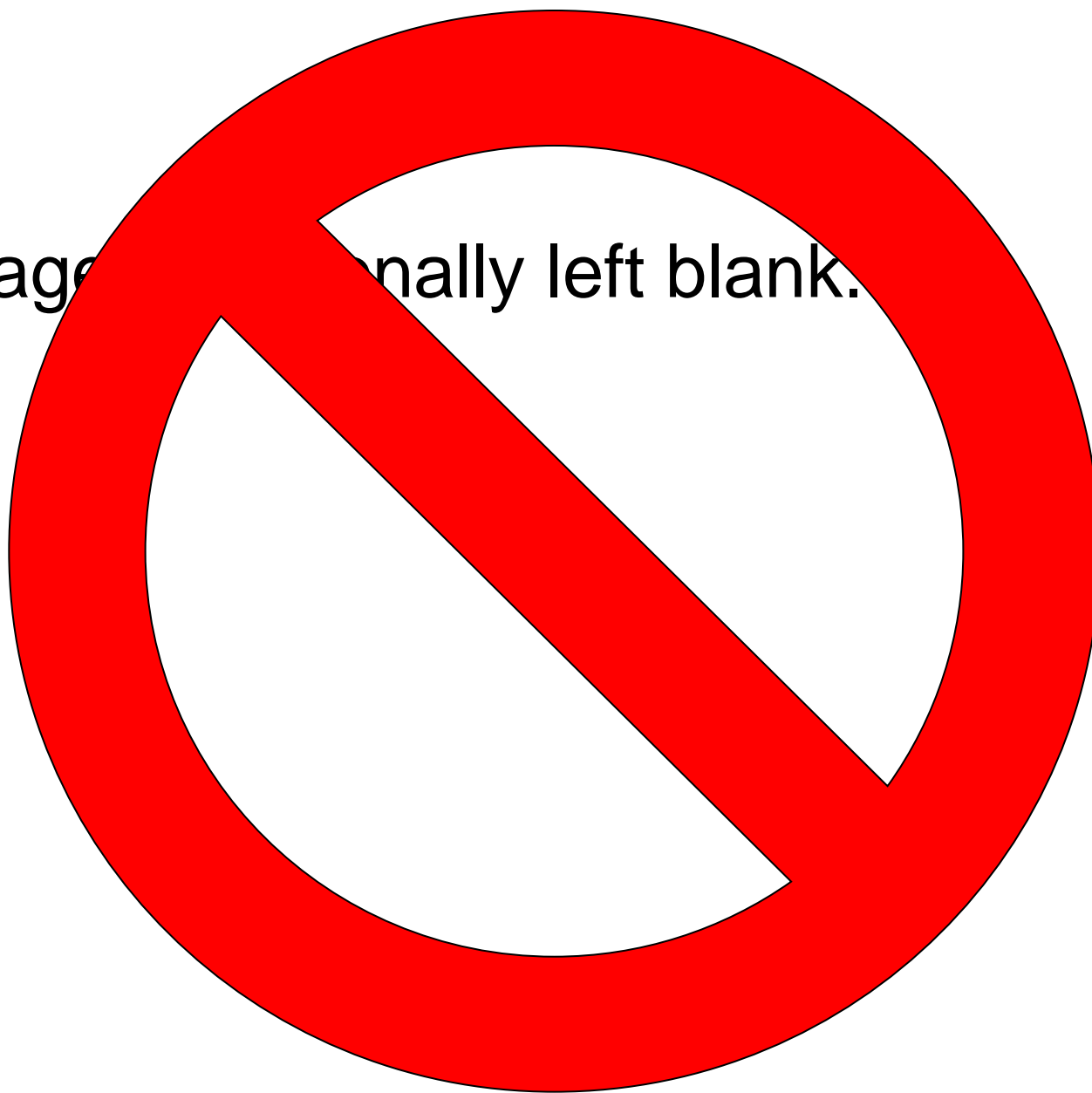
# HW #1: Installing and Using MySQL & MongoDB

- In this assignment, you will gain experience installing and using an actual DBMS.

- This semester, we will be using MySQL, an open-source DBMS. I have placed a document that explains *how to install and use MySQL*. It would be a good idea to read that document and be ready to use MySQL before proceeding with the assignment.

# HW #1 (2)

- 以下為 Books、Bookstores、與 Orders 三個資料庫範例。請先將三資料表內容建立於自己的 sql 資料庫中。

# HW #1 (3)

- **Books**

| id | bookname | author | price | category | publisher |
|----|----------|--------|-------|----------|-----------|
| 1 | 三國演義 | 羅貫中 | 120 | 文學類 | 古文出版社 |
| 2 | 水滸傳 | 施耐庵 | 170 | 文學類 | 中庸出版社 |
| 3 | 紅樓夢 | 曹雪芹 | 170 | 文學類 | 春秋出版社 |
| 4 | 西遊記 | 吳承恩 | 140 | 文學類 | 聊齋出版社 |
| 5 | 水經注 | 酈道元 | 120 | 文學類 | 易經出版社 |
| 6 | 道德經 | 老子 | 190 | 文學類 | 大唐出版社 |
| 7 | 孫子兵法 | 孫子 | 200 | 文學類 | 大唐出版社 |
| 8 | Web架站實務 | 張三 | 450 | 電腦類 | 微軟出版社 |
| 9 | 英美文學讀本 | 李四 | 250 | 語言類 | 哈佛出版社 |
| 10 | 日文讀本 | 王五 | 280 | 語言類 | 耶魯出版社 |
| 11 | 德語入門 | 毛六 | 320 | 語言類 | 牛津出版社 |
| 12 | 應用法語入門 | 李四 | 220 | 語言類 | 劍橋出版社 |

# HW #1 (4)

- **Bookstores**

| no | name | city |
|----|------|------|
| 1 | 巨蟹書局 | 台北市 |
| 2 | 射手書局 | 高雄市 |
| 3 | 水瓶書局 | 新竹市 |
| 4 | 天秤書局 | 台中市 |
| 5 | 獅子書局 | 台南市 |

# HW #1 (5)

- **Orders**

| no | id | quantity |
|----|----|----------|
| 1  | 2  | 20       |
| 1  | 3  | 40       |
| 2  | 4  | 5        |
| 3  | 1  | 25       |
| 3  | 2  | 20       |
| 3  | 3  | 15       |
| 3  | 4  | 30       |
| 3  | 5  | 40       |

| no | id | quantity |
|----|----|----------|
| 3  | 6  | 20       |
| 3  | 7  | 50       |
| 3  | 8  | 30       |
| 3  | 9  | 20       |
| 3  | 10 | 10       |
| 3  | 11 | 40       |
| 3  | 12 | 50       |
| 4  | 3  | 20       |

| no | id | quantity |
|----|----|----------|
| 4  | 5  | 30       |
| 5  | 1  | 10       |
| 5  | 2  | 20       |
| 5  | 5  | 30       |
| 5  | 8  | 10       |
| 5  | 9  | 15       |
| 5  | 10 | 30       |
| 5  | 12 | 10       |

# HW #1 (6)

- 之後在 sql 查詢的功能中輸入以下三個查詢：

# HW #1 (7)

- 查詢**1**：找出所有書籍不重覆的所有價格。列出價格 (由小至大排列)。

SELECT DISTINCT Books.price

FROM Books

ORDER BY price;

# HW #1 (8)

- 查詢2：找出所有種類書籍的數量。列出書籍種類、該種類的數量。

SELECT Books.category, COUNT(Books.id)

FROM Books

GROUP BY category;

# HW #1 (9)

- 查詢3：找出那些訂購所有書籍 (沒有一本書它不訂購) 的書局名稱。列出書局名稱、所在縣市。

**SELECT Bookstores.name, Bookstores.city**

**FROM Bookstores**

**WHERE NOT EXISTS (**

    **SELECT ***

    **FROM Books**

    **WHERE NOT EXISTS (**    **SELECT ***

                      **FROM Orders**

                      **WHERE Bookstores.no = Orders.no**

                      **AND Orders.id = Books.id**    **));**

# HW #1 (10)

- In the second part of this assignment, you will use a NoSQL database system called MongoDB.

- Download and install MongoDB
**https://www.w3resource.com/mongodb/installation-windows.php**

- Re-Write the previous three queries in MongoDB.

# HW #1 (11)

**//**新增多筆資料至**Books**集合

**db.Books.insertMany([**

　　**{id:1,bookname:"**三國演義**",author:"**羅貫中**",price:120,category:"**文學類**",publisher:"**古文出版社**"},**

　　**{id:2,bookname:"**水滸傳**",author:"**施耐庵**",price:170,category:"**文學類**",publisher:"**中庸出版社**"},**

　　**{id:3,bookname:"**紅樓夢**",author:"**曹雪芹**",price:170,category:"**文學類**",publisher:"**春秋出版社**"},**

　　**{id:4,bookname:"**西遊記**",author:"**吳承恩**",price:140,category:"**文學類**",publisher:"**聊齋出版社**"},**

　　**{id:5,bookname:"**水經注**",author:"**酈道元**",price:120,category:"**文學類**",publisher:"**易經出版社**"},**

　　**{id:6,bookname:"**道德經**",author:"**老子**",price:190,category:"**文學類**",publisher:"**大唐出版社**"},**

# HW #1 (12)

{id:7,bookname:"孫子兵法",author:"孫子",price:200,category:"文學類",publisher:"大唐出版社"},

{id:8,bookname:"Web架站實務",author:"張三",price:450,category:"電腦類",publisher:"微軟出版社"},

{id:9,bookname:"英美文學讀本",author:"李四",price:250,category:"語言類",publisher:"哈佛出版社"},

{id:10,bookname:"日文讀本",author:"王五",price:280,category:"語言類",publisher:"耶魯出版社"},

{id:11,bookname:"德語入門",author:"毛六",price:320,category:"語言類",publisher:"牛津出版社"},

{id:12,bookname:"應用法語入門",author:"李四",price:220,category:"語言類",publisher:"劍橋出版社"}
])

# HW #1 (13)

**//**新增多筆資料至**Bookstores**集合

```
db.Bookstores.insertMany([
    {no:1,name:"巨蟹書局",city:"台北市"},
    {no:2,name:"射手書局",city:"高雄市"},
    {no:3,name:"水瓶書局",city:"新竹市"},
    {no:4,name:"天秤書局",city:"台中市"},
    {no:5,name:"獅子書局",city:"台南市"}
])
```

# HW #1 (14)

//新增多筆資料至**Orders**集合

**db.Orders.insertMany([**

    **{no:1,id:2,quantity:20},**

    **{no:1,id:3,quantity:40},**

    **{no:2,id:4,quantity:5},**

    **{no:3,id:1,quantity:25},**

    **{no:3,id:1,quantity:20},**

    **{no:3,id:2,quantity:15},**

    **{no:3,id:4,quantity:30},**

    **{no:3,id:5,quantity:40},**

    **{no:3,id:6,quantity:20},**

    **{no:3,id:7,quantity:50},**

**{no:3,id:8,quantity:30},**
**{no:3,id:9,quantity:20},**
**{no:3,id:10,quantity:10},**
**{no:3,id:11,quantity:40},**

**{no:3,id:12,quantity:50},**

**{no:3,id:3,quantity:20},**

**{no:4,id:5,quantity:30},**

**{no:5,id:1,quantity:10},**

**{no:5,id:2,quantity:20},**

**{no:5,id:5,quantity:30},**

**{no:5,id:8,quantity:10},**

**{no:5,id:9,quantity:15},**

**{no:5,id:10,quantity:30},**

**{no:5,id:12,quantity:10}**

**])**

MongoDB 4.4.4 Community

Filter your data

D
Books ...
Bookstores
Orders

admin
config
local
test

_id: ObjectId("603d8e46d6a5e0f4de8e49b5")
id: 1
bookname: "三國演義"
author: "羅貫中"
price: 120
category: "文學類"
publisher: "古文出版社"

_id: ObjectId("603d8e46d6a5e0f4de8e49b6")
id: 2
bookname: "水滸傳"
author: "施耐庵"
price: 170
category: "文學類"
publisher: "中庸出版社"

_id: ObjectId("603d8e46d6a5e0f4de8e49b7")
id: 3
bookname: "紅樓夢"
author: "曹雪芹"
price: 170
category: "文學類"
publisher: "春秋出版社"

_id: ObjectId("603d8e46d6a5e0f4de8e49b8")
id: 4
bookname: "西遊記"
author: "吳承恩"

我們起個頭，
剩下的部份請自己想辦法…

```
> db.Books.find().pretty()
{
        "_id" : ObjectId("603d8e46d6a5e0f4de8e49b5"),
        "id" : 1,
        "bookname" : "三國演義",
        "author" : "羅貫中",
        "price" : 120,
        "category" : "文學類",
        "publisher" : "古文出版社"
}
{
        "_id" : ObjectId("603d8e46d6a5e0f4de8e49b6"),
        "id" : 2,
        "bookname" : "水滸傳",
        "author" : "施耐庵",
        "price" : 170,
        "category" : "文學類",
        "publisher" : "中庸出版社"
}
{
        "_id" : ObjectId("603d8e46d6a5e0f4de8e49b7"),
        "id" : 3,
        "bookname" : "紅樓夢",
        "author" : "曹雪芹",
        "price" : 170,
        "category" : "文學類",
        "publisher" : "春秋出版社"
}
{
        "_id" : ObjectId("603d8e46d6a5e0f4de8e49b8"),
        "id" : 4,
        "bookname" : "西遊記",
        "author" : "吳承恩",
        "price" : 140,
        "category" : "文學類",
        "publisher" : "聊齋出版社"
}
{
        "_id" : ObjectId("603d8e46d6a5e0f4de8e49b9"),
        "id" : 5,
        "bookname" : "水經注",
        "author" : "酈道元",
        "price" : 120,
        "category" : "文學類",
        "publisher" : "易經出版社"
}
{
        "_id" : ObjectId("603d8e46d6a5e0f4de8e49ba"),
        "id" : 6,
        "bookname" : "道德經",
        "author" : "老子",
        "price" : 190,
        "category" : "文學類",
        "publisher" : "大唐出版社"
}
```

```
> db.Bookstores.find().pretty()
{
        "_id" : ObjectId("603d8e5dd6a5e0f4de8e49c1"),
        "no" : 1,
        "name" : "巨蟹書局",
        "city" : "台北市"
}
{

        "_id" : ObjectId("603d8e5dd6a5e0f4de8e49c2"),
        "no" : 2,
        "name" : "射手書局",
        "city" : "高雄市"
}
{

        "_id" : ObjectId("603d8e5dd6a5e0f4de8e49c3"),
        "no" : 3,
        "name" : "水瓶書局",
        "city" : "新竹市"
}
{

        "_id" : ObjectId("603d8e5dd6a5e0f4de8e49c4"),
        "no" : 4,
        "name" : "天秤書局",
        "city" : "台中市"
}
{

        "_id" : ObjectId("603d8e5dd6a5e0f4de8e49c5"),
        "no" : 5,
        "name" : "獅子書局",
        "city" : "台南市"
}
>
```

```
> db.Orders.find().pretty()
{
        "_id" : ObjectId("603d8bcbd6a5e0f4de8e499d"),
        "no" : 1,
        "id" : 2,
        "quantity" : 20
}
{
        "_id" : ObjectId("603d8bcbd6a5e0f4de8e499e"),
        "no" : 1,
        "id" : 3,
        "quantity" : 40
}
{
        "_id" : ObjectId("603d8bcbd6a5e0f4de8e499f"),
        "no" : 2,
        "id" : 4,
        "quantity" : 5
}
{
        "_id" : ObjectId("603d8bcbd6a5e0f4de8e49a0"),
        "no" : 3,
        "id" : 1,
        "quantity" : 25
}
{
        "_id" : ObjectId("603d8bcbd6a5e0f4de8e49a1"),
        "no" : 3,
        "id" : 1,
        "quantity" : 20
}
{
        "_id" : ObjectId("603d8bcbd6a5e0f4de8e49a2"),
        "no" : 3,
        "id" : 2,
        "quantity" : 15
}
{
        "_id" : ObjectId("603d8bcbd6a5e0f4de8e49a3"),
        "no" : 3,
        "id" : 4,
        "quantity" : 30
}
{
        "_id" : ObjectId("603d8bcbd6a5e0f4de8e49a4"),
        "no" : 3,
        "id" : 5,
        "quantity" : 40
}
{
        "_id" : ObjectId("603d8bcbd6a5e0f4de8e49a5"),
        "no" : 3,
        "id" : 6,
        "quantity" : 20
```

# HW #1 (15)

- 查詢**1**：找出所有書籍不重覆的所有價格。列出價格 (由小至大排列)。

**//**此方法對大規模數據不適用，因為**distinct**最多能使用**16M**空間

**db.Books.runCommand({distinct:"Books",key:"price"}).values**

```
> db.Books.runCommand({distinct:"Books",key:"price"}).values
[ 120, 140, 170, 190, 200, 220, 250, 280, 320, 450 ]
```

# HW #1 (16)

- 查詢2：找出所有種類書籍的數量。列出書籍種類、該種類的數量。

**db.Books.aggregate([**
  **{ $match : {}},**
  **{ $group : {_id: "$category", count:{$sum: 1}}}**
**])**

```
> db.Books.aggregate([
... { $match : {}},
...     { $group : {_id: "$category", count:{$sum: 1}}}
... ])
{ "_id" : "語言類", "count" : 4 }
{ "_id" : "文學類", "count" : 7 }
{ "_id" : "電腦類", "count" : 1 }
```

# HW #1 (17)

- 查詢3：找出那些訂購所有書籍 (沒有一本書它不訂購) 的書局名稱。列出書局名稱、所在縣市。

```
db.Orders.aggregate([
    {
        $lookup:
        {
                from: "Bookstores",
                localField: "no",
                foreignField: "no",
                as: "Bookstores_name"
        }
    },
    {
        $unwind:"$Bookstores_name"
    },
```

# HW #1 (18)

```
        {
                $lookup:
                {
                            from: "Books",
                            localField: "id",
                            foreignField: "id",
                            as: "Books_name"
                }
        },
        {

        $unwind:"$Books_name"

        },
        {

                "$project" :
                {
                            訂購書名 : "$Books_name.bookname",
                            訂購書店 : "$Bookstores_name.name",
                            書局縣市 : "$Bookstores_name.city"
                }
        }
]).pretty()
```

# HW #1 (19)

```
// 同查詢3，輸出去掉id

db.Orders.aggregate([
    {
        $lookup:
        {
                from: "Bookstores",
                localField: "no",
                foreignField: "no",
                as: "Bookstores_name"
        }
    },
    {
        $unwind:"$Bookstores_name"
    },
```

# HW #1 (20)

```
{
        $lookup:
        {
                    from: "Books",
                    localField: "id",
                    foreignField: "id",
                    as: "Books_name"
        }
},
{
        $unwind:"$Books_name"

},
{
        "$project" :
        {
                    _id:0,
                    訂購書名 : "$Books_name.bookname",
                    訂購書店 : "$Bookstores_name.name",
                    書局縣市 : "$Bookstores_name.city"

        }
    }
]).pretty()
```

```
{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e499d"),
        "A"      : "水滸傳",
        "B"      : "巨蟹書局",
        "C"      : "台北市"
}
{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e499e"),
        "A"      : "紅樓夢",
        "B"      : "巨蟹書局",
        "C"      : "台北市"
}
{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e499f"),
        "A"      : "西遊記",
        "B"      : "射手書局",
        "C"      : "高雄市"
}
{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e49a0"),
        "A"      : "三國演義",
        "B"      : "水瓶書局",
        "C"      : "新竹市"
}
{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e49a1"),
        "A"      : "三國演義",
        "B"      : "水瓶書局",
        "C"      : "新竹市"
}

{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e49a2"),
        "A"      : "水滸傳",
        "B"      : "水瓶書局",
        "C"      : "新竹市"
}
{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e49a3"),
        "A"      : "西遊記",
        "B"      : "水瓶書局",
        "C"      : "新竹市"
}
{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e49a4"),
        "A"      : "水經注",
        "B"      : "水瓶書局",
        "C"      : "新竹市"
}
{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e49a5"),
        "A"      : "道德經",
        "B"      : "水瓶書局",
        "C"      : "新竹市"
}
{
        "_id"    : ObjectId("603d8bcbd6a5e0f4de8e49a6"),
        "A"      : "孫子兵法",
        "B"      : "水瓶書局",
        "C"      : "新竹市"
}
```

```
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49a7"),
    "A" : "Web架站實務",
    "B" : "水瓶書局",
    "C" : "新竹市"
}
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49a8"),
    "A" : "英美文學讀本",
    "B" : "水瓶書局",
    "C" : "新竹市"
}
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49a9"),
    "A" : "日文讀本",
    "B" : "水瓶書局",
    "C" : "新竹市"
}
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49aa"),
    "A" : "德語入門",
    "B" : "水瓶書局",
    "C" : "新竹市"
}
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49ab"),
    "A" : "應用法語入門",
    "B" : "水瓶書局",
    "C" : "新竹市"
}

{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49ac"),
    "A" : "紅樓夢",
    "B" : "水瓶書局",
    "C" : "新竹市"
}
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49ad"),
    "A" : "水經注",
    "B" : "天秤書局",
    "C" : "台中市"
}
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49ae"),
    "A" : "三國演義",
    "B" : "獅子書局",
    "C" : "台南市"
}
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49af"),
    "A" : "水滸傳",
    "B" : "獅子書局",
    "C" : "台南市"
}
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49b0"),
    "A" : "水經注",
    "B" : "獅子書局",
    "C" : "台南市"
}
Type "it" for more
> it
{
    "_id" : ObjectId("603d8bcbd6a5e0f4de8e49b1"),
    "A" : "Web架站實務",
    "B" : "獅子書局",
    "C" : "台南市"
}
{
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