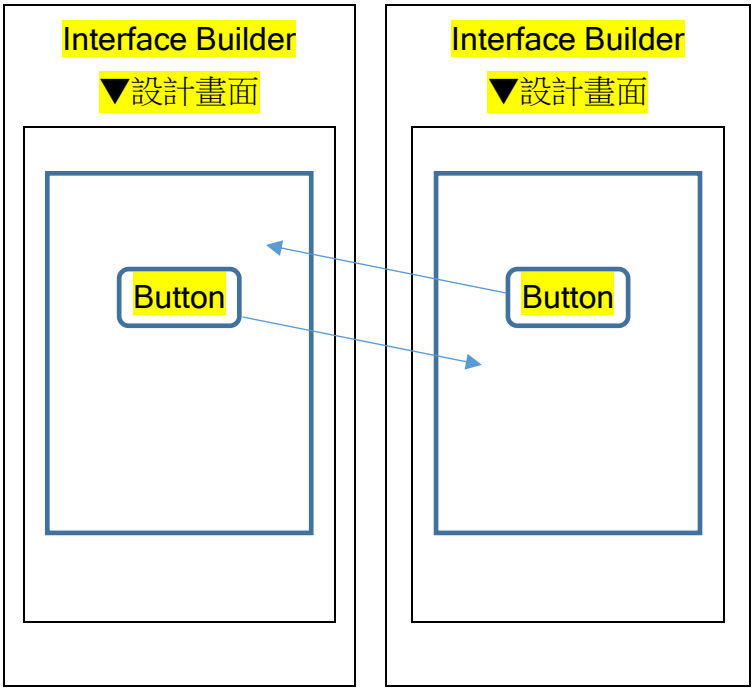
CHAPTER 12-3

SQLite 資料庫使用

建置 SQLite 資料庫並由其中查詢資料

學習概念：

1. 首先用 viewController 建立第二個視窗。
2. 新增一個 swift 程式，並將其與新視窗連結。
3. 於第一個視窗中新增一個 Button 製作換場效果到第二個視窗；在第二個視窗中新增一個 Button 製作換場效果到第一個視窗。



【執行結果】

當 App 執行後，點選第一頁的 Next 會切換到第二頁，點選第二頁的 Back 會切換到第一頁。

Step.1

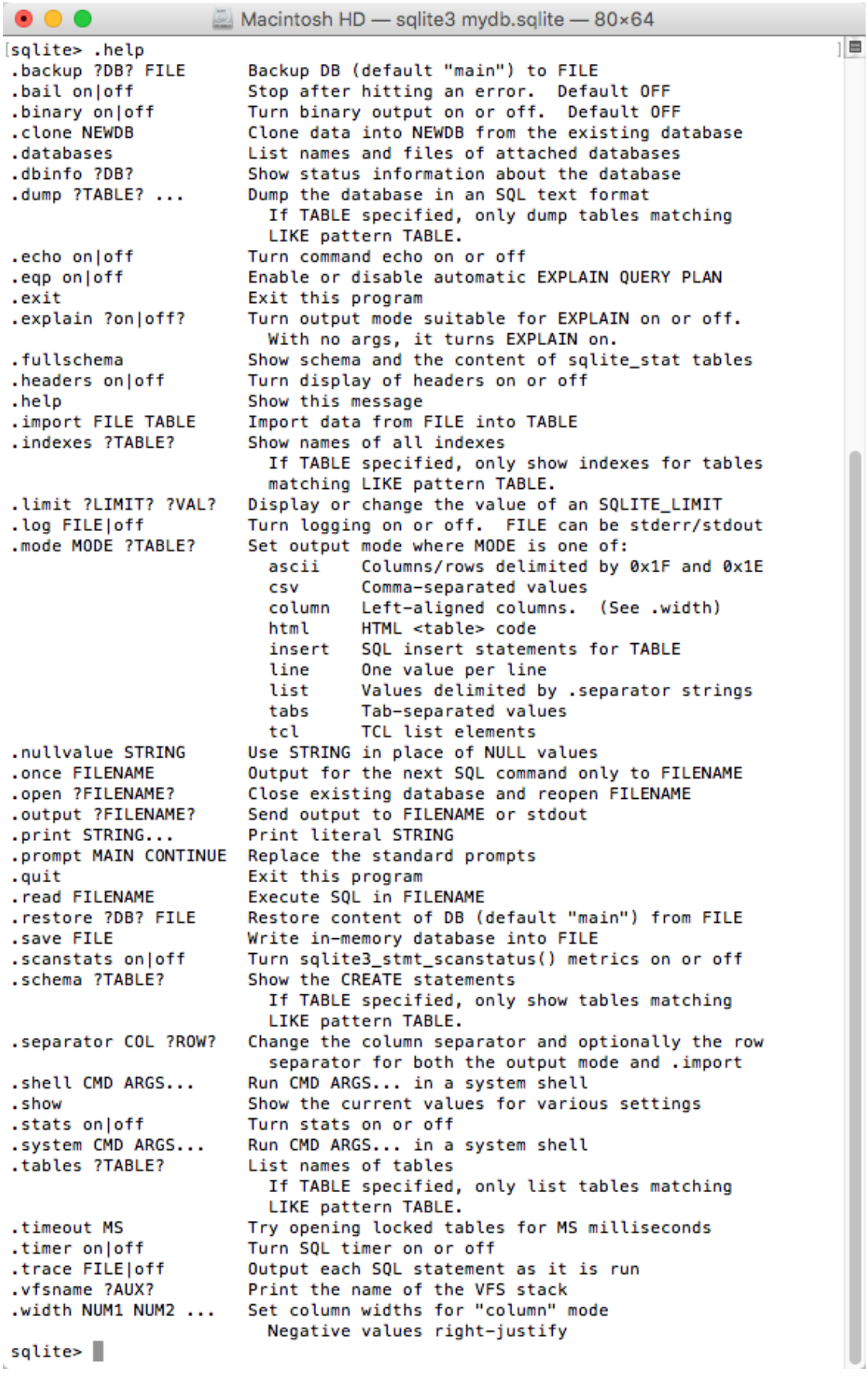
建立 SQLite 資料庫

進入 Launchpad 點選終端機

於終端機的命令列中輸入 sqlite3 mydb.sqlite
將會建立一個 mydb.sqlite 的資料庫

```
SQLite version 3.8.10.2 2015-05-20 18:17:19
Enter ".help" for usage hints.
sqlite>
```

輸入 .help 可以看到一些常用的指令


Macintosh HD — sqlite3 mydb.sqlite — 80×64
sqlite> .help
.backup ?DB? FILE Backup DB (default "main") to FILE
.bail on|off Stop after hitting an error. Default OFF
.binary on|off Turn binary output on or off. Default OFF
.clone NEWDB Clone data into NEWDB from the existing database
.databases List names and files of attached databases
.dbinfo ?DB? Show status information about the database
.dump ?TABLE? ... Dump the database in an SQL text format
If TABLE specified, only dump tables matching
LIKE pattern TABLE.
.echo on|off Turn command echo on or off
.eqp on|off Enable or disable automatic EXPLAIN QUERY PLAN
.exit Exit this program
.explain ?on|off? Turn output mode suitable for EXPLAIN on or off.
With no args, it turns EXPLAIN on.
.fullschema Show schema and the content of sqlite_stat tables
.headers on|off Turn display of headers on or off
.help Show this message
.import FILE TABLE Import data from FILE into TABLE
.indexes ?TABLE? Show names of all indexes
If TABLE specified, only show indexes for tables
matching LIKE pattern TABLE.
.limit ?LIMIT? ?VAL? Display or change the value of an SQLITE_LIMIT
.log FILE|off Turn logging on or off. FILE can be stderr/stdout
.mode MODE ?TABLE? Set output mode where MODE is one of:
ascii Columns/rows delimited by 0x1F and 0x1E
csv Comma-separated values
column Left-aligned columns. (See .width)
html HTML <table> code
insert SQL insert statements for TABLE
line One value per line
list Values delimited by .separator strings
tabs Tab-separated values
tcl TCL list elements
.nullvalue STRING Use STRING in place of NULL values
.once FILENAME Output for the next SQL command only to FILENAME
.open ?FILENAME? Close existing database and reopen FILENAME
.output ?FILENAME? Send output to FILENAME or stdout
.print STRING... Print literal STRING
.prompt MAIN CONTINUE Replace the standard prompts
.quit Exit this program
.read FILENAME Execute SQL in FILENAME
.restore ?DB? FILE Restore content of DB (default "main") from FILE
.save FILE Write in-memory database into FILE
.scanstats on|off Turn sqlite3_stmt_scanstatus() metrics on or off
.schema ?TABLE? Show the CREATE statements
If TABLE specified, only show tables matching
LIKE pattern TABLE.
.separator COL ?ROW? Change the column separator and optionally the row
separator for both the output mode and .import
.shell CMD ARGS... Run CMD ARGS... in a system shell
.show Show the current values for various settings
.stats on|off Turn stats on or off
.system CMD ARGS... Run CMD ARGS... in a system shell
.tables ?TABLE? List names of tables
If TABLE specified, only list tables matching
LIKE pattern TABLE.
.timeout MS Try opening locked tables for MS milliseconds
.timer on|off Turn SQL timer on or off
.trace FILE|off Output each SQL statement as it is run
.vfsname ?AUX? Print the name of the VFS stack
.width NUM1 NUM2 ... Set column widths for "column" mode
Negative values right-justify
sqlite>

在此使用 .database 可以看到剛建立的資料庫 mydb.sqlite 的儲存位置

```
sqlite> .database
seq  name             file
---  ---------------  ----------------------------------------------------------
0    main             /Users/shli/mydb.sqlite
sqlite>
```

在本範例中將建立一個 userdata 的資料表 userdata 內有兩個欄位。
create table userdata (iid text primary key, cname text);

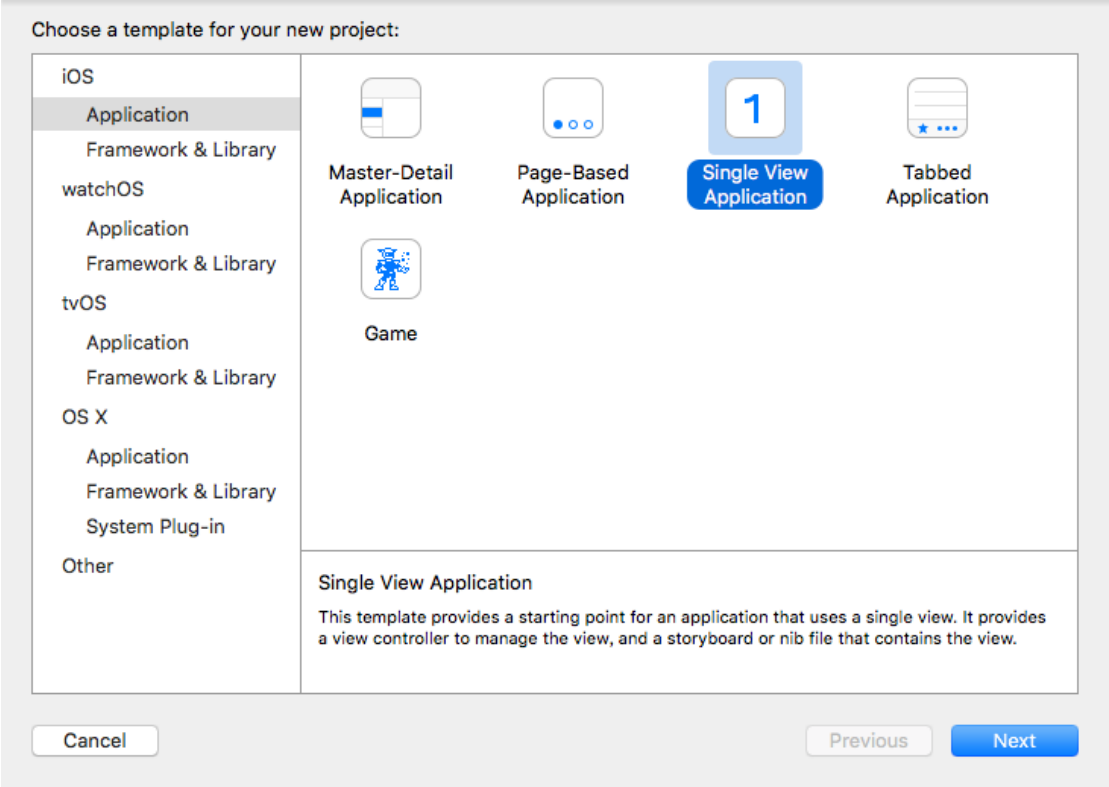
並新增兩筆資料。
sqlite> insert into userdata values ('001', 'peter');
sqlite> insert into userdata values ('002', 'david');

透過查詢，檢視所新增的兩筆資料是否存在於userdata的表格中。
sqlite> select * from userdata;

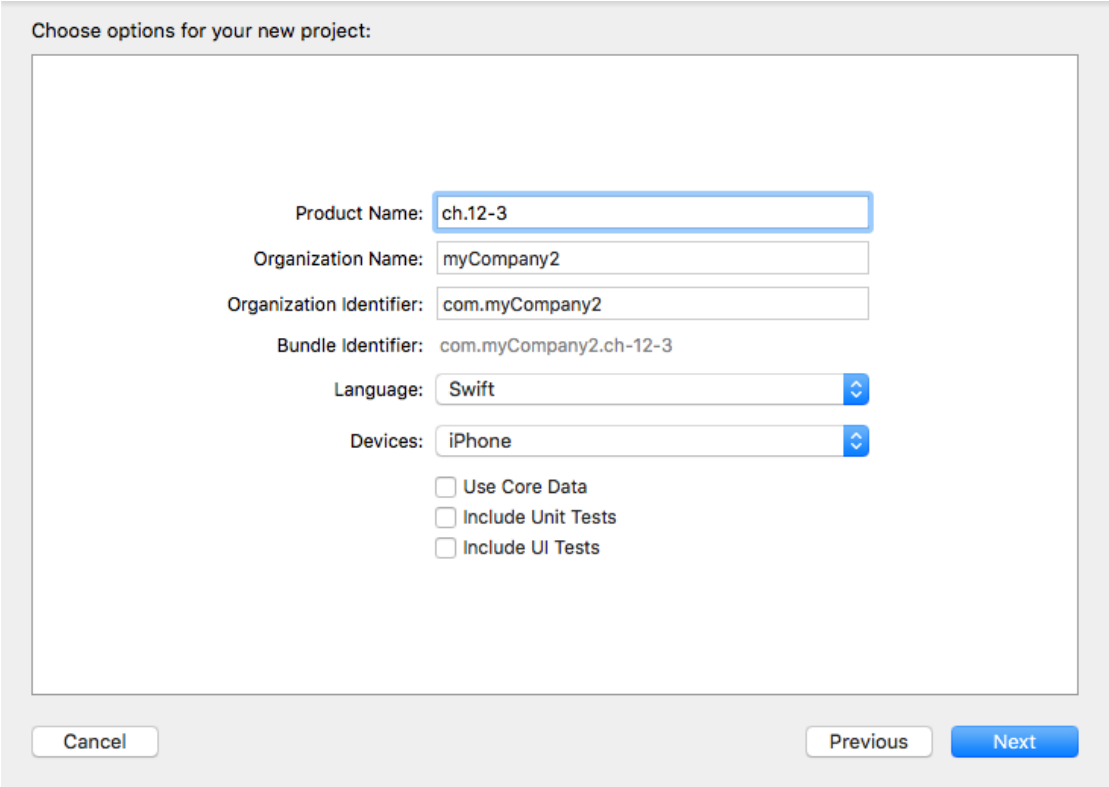
```
sqlite> create table userdata (iid text primary key, cname text);
sqlite> insert into userdata values ('001', 'peter');
sqlite> insert into userdata values ('002', 'david');
sqlite> select * from userdata;
001|peter
002|david
sqlite>
```

Step.2

開啟 xcode 時會出現的畫面，點選 iOS 下的【Application】，接著右視窗選擇【Single View Application】，點選【Next】選項後進入設定的基本視窗。

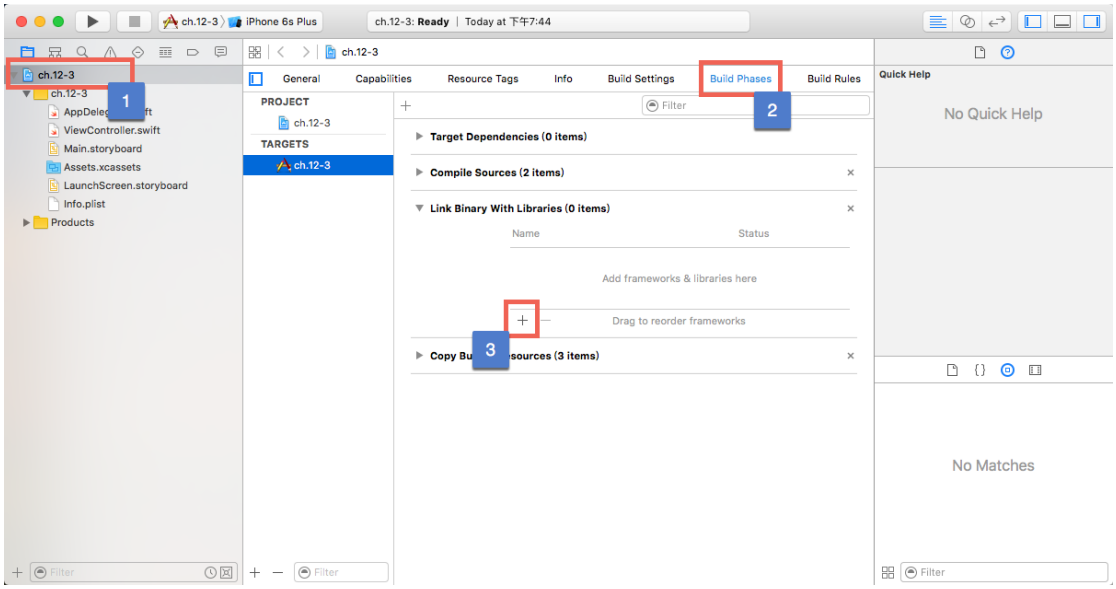


檔名及名稱設定，請將【Product Name】設定為 ch.12-3

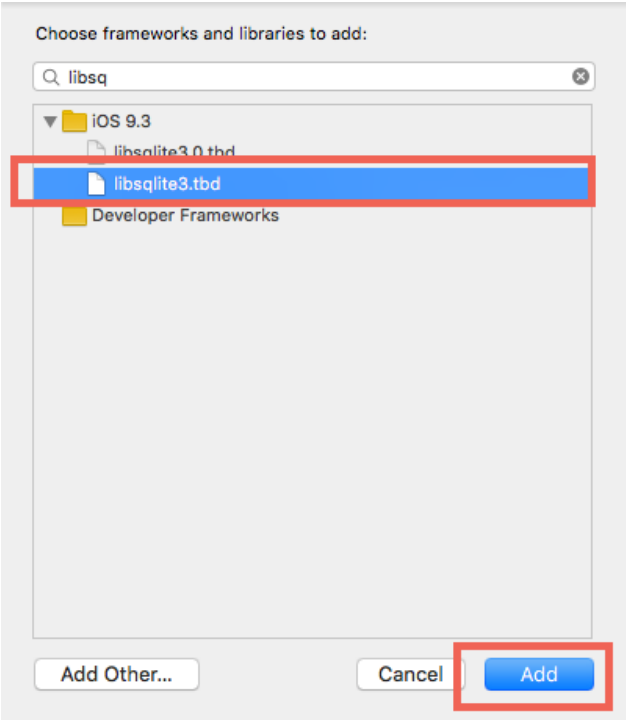


Step.3

於 Framework 裡加入 libsqlite3.tbd。



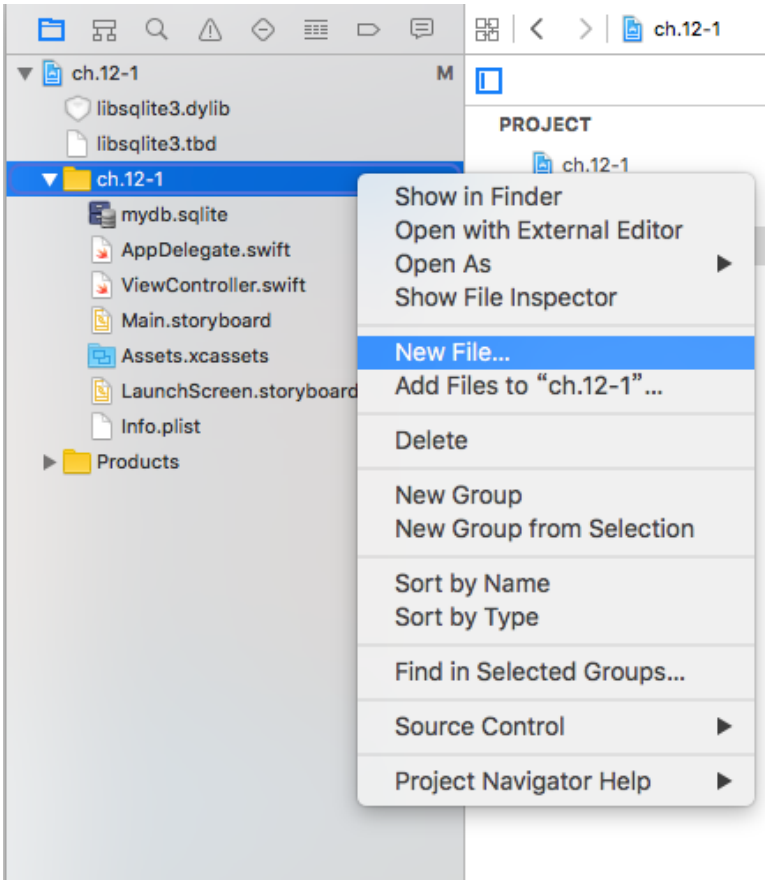
libsqlite3.tbd 是連結至「最新的 sqlite library」，雖然目前最新的是 libsqlite3.0.tbd，但是為了維護性，還是使用 libsqlite3.tbd



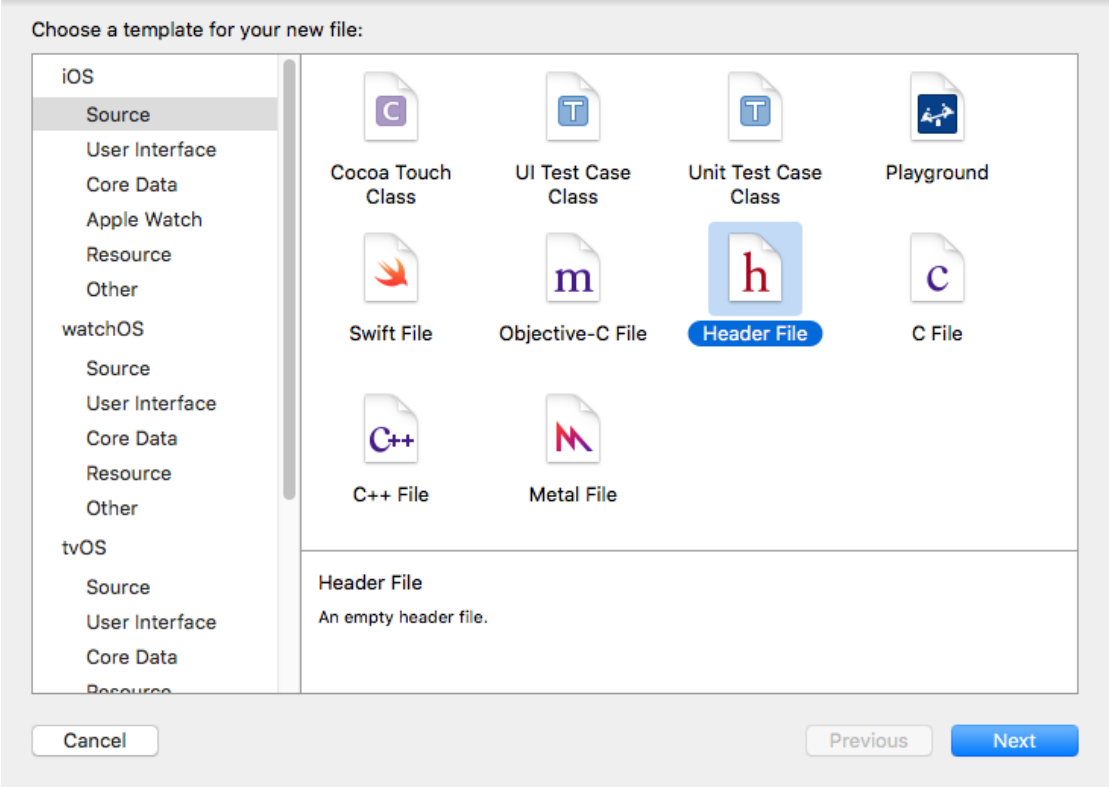
Step.4

因為 libsqlite3.tbd 是 Objective-C 的函式庫， 因此需要建立 swift 與 Objective-C 的連結。
建立 bridge header file , 作為 swift 與 object-c 的連結橋樑

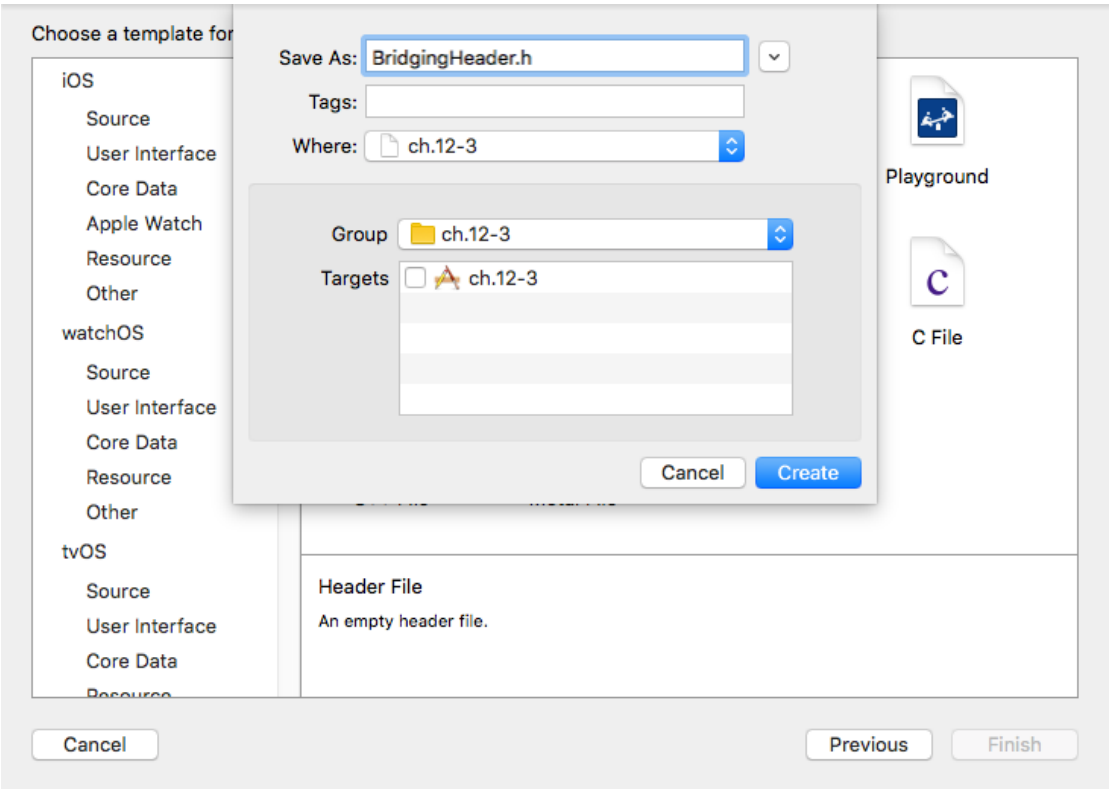
(1) 選擇新增檔案 (New File)



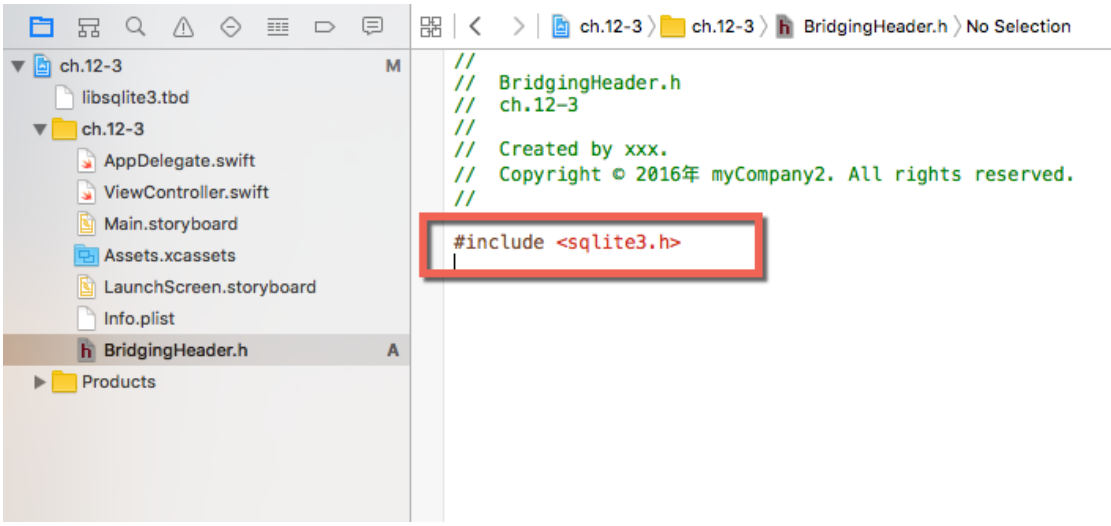
(2) 選擇 Header File 格式的標頭檔。



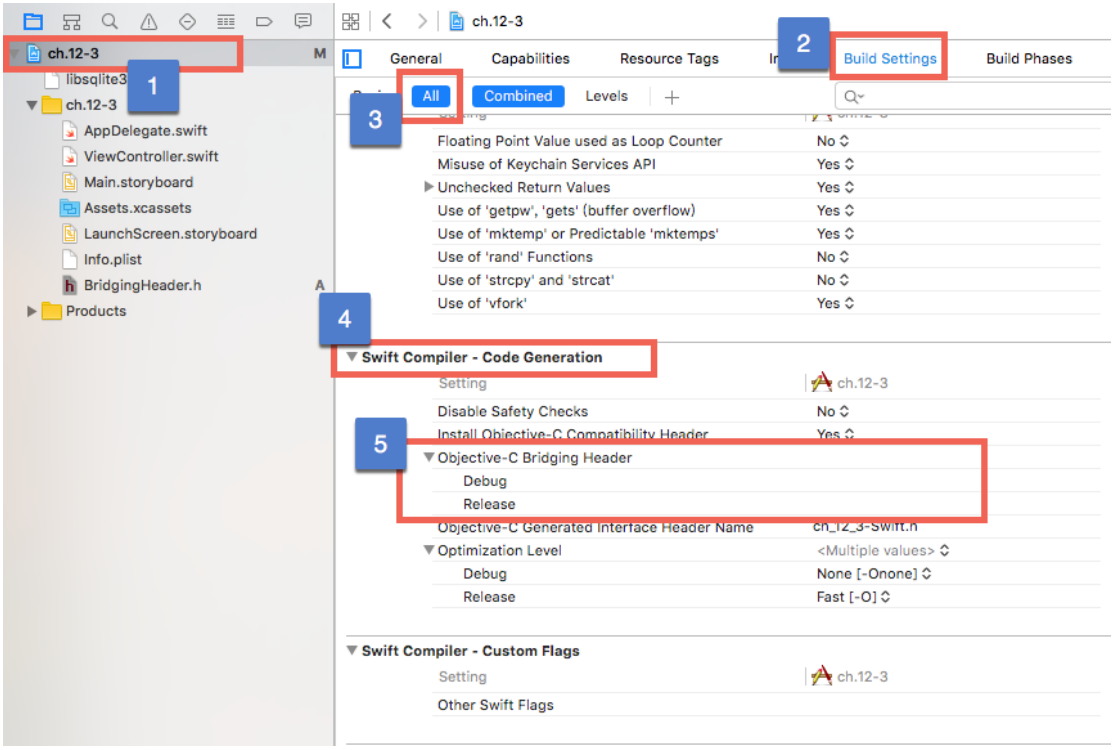
(3) 將標頭檔命名為 BridgingHeader.h



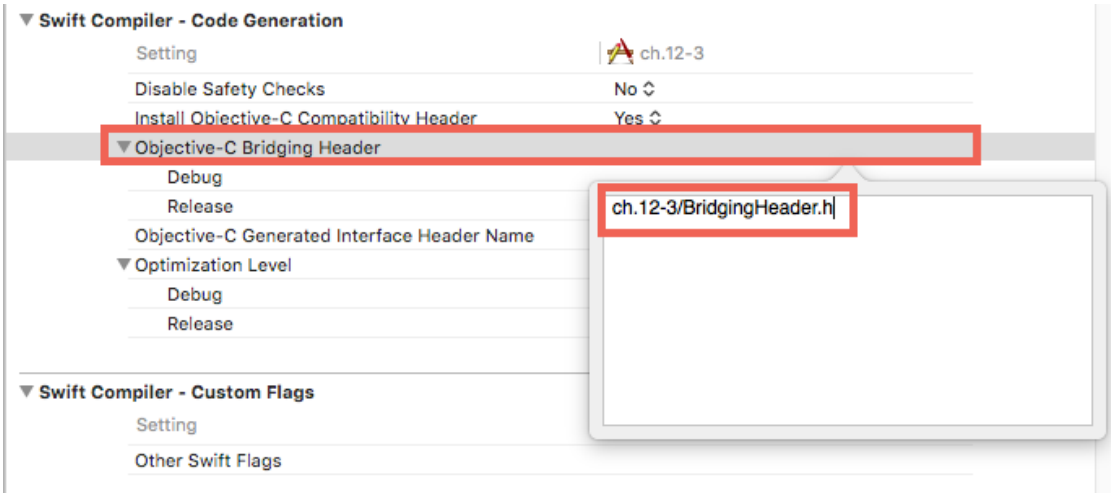
(4) 開啟 BridgingHeader.h，在其中加入一行指令 #include <sqlite3.h>



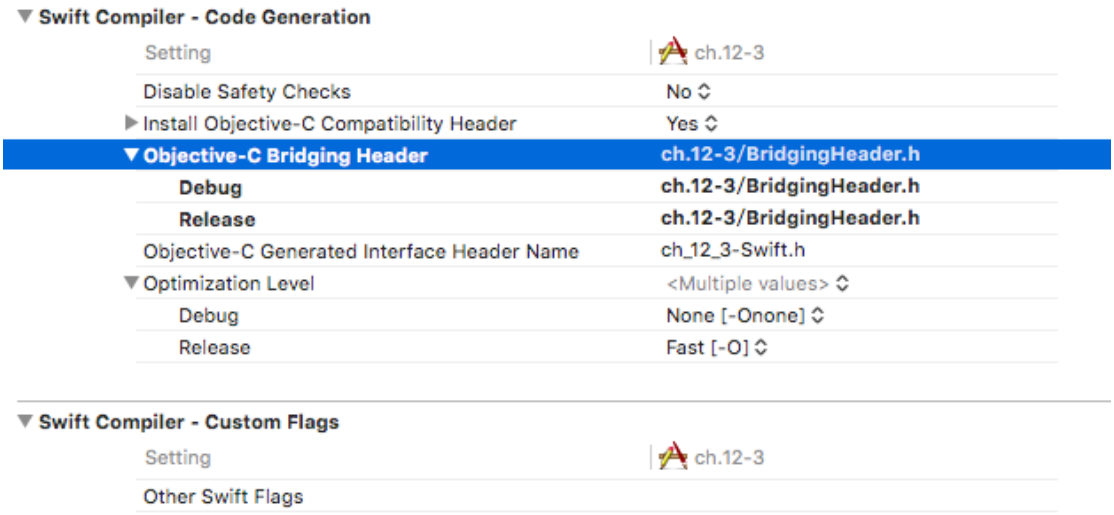
(5) 設定 Swift Complier 連結 Objective-C 的連結橋樑



(6) 點兩下即可開啟視窗，於是窗內加入橋接的標頭檔路徑

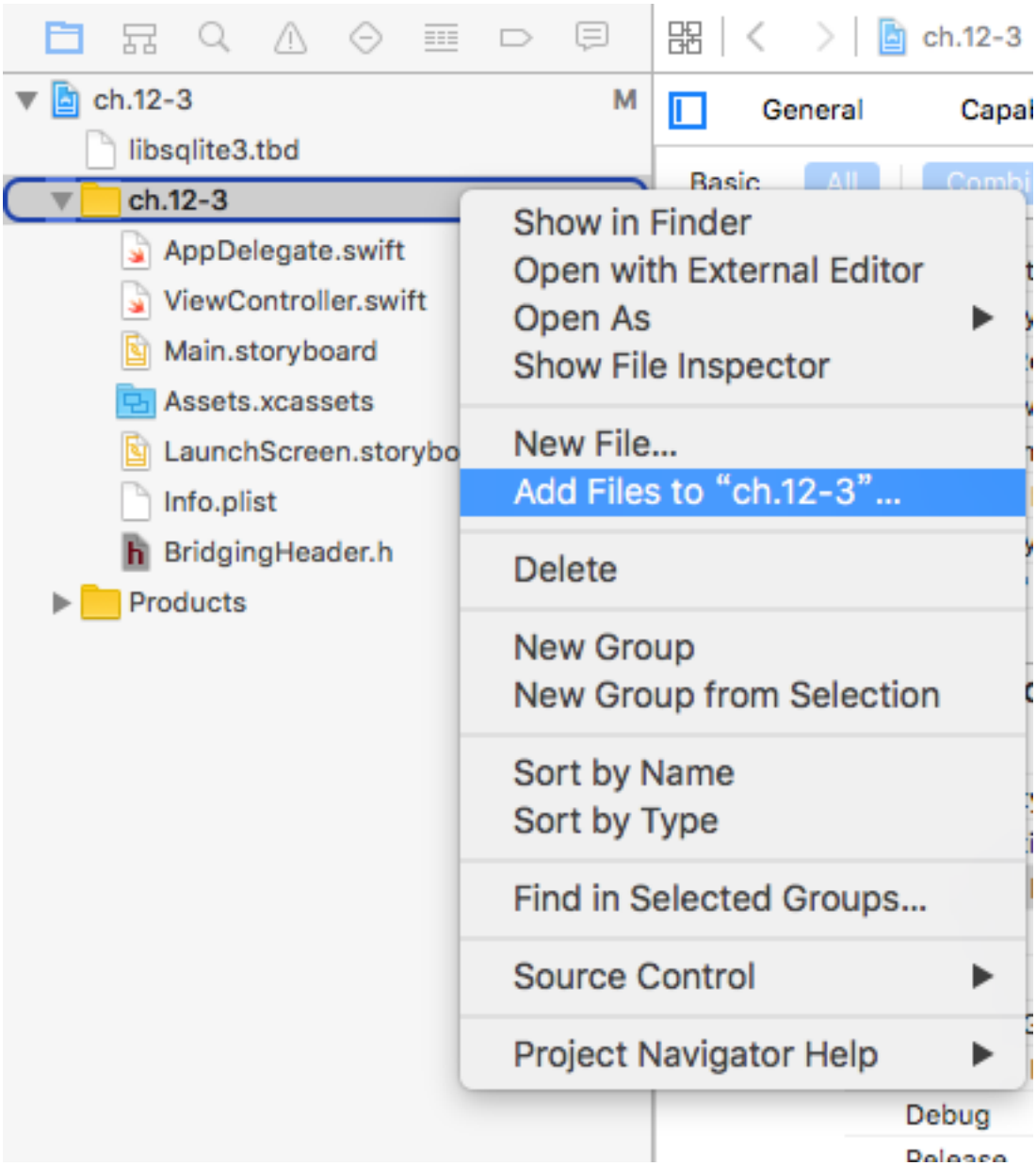


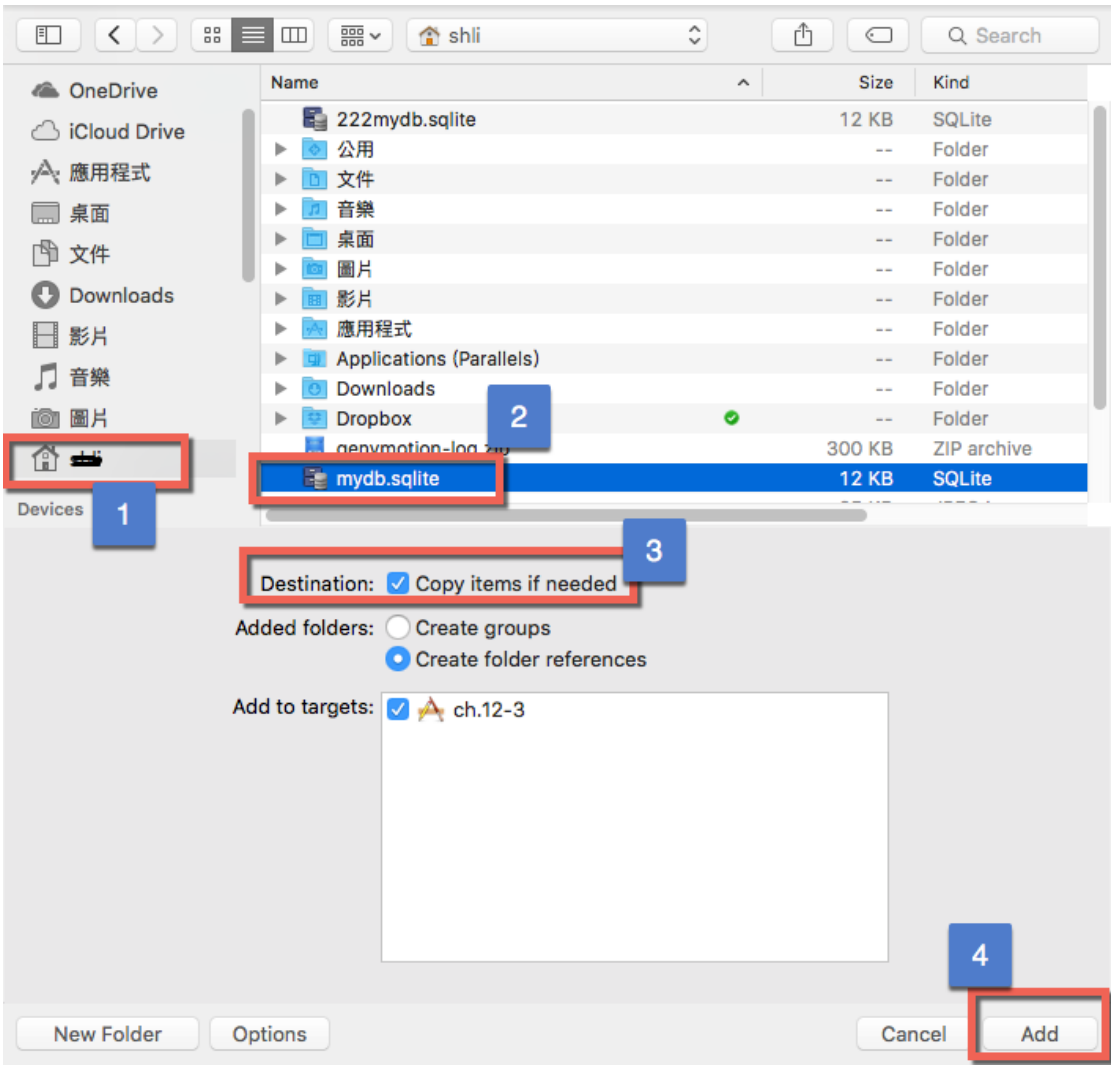
(7) 加入後會顯示出已經加入的路徑與檔名。



Step.5

將步驟一所建立的 mydb.sqlite 加入到 專案中， 請記得勾選 Copy items if needed， 才會將 mydb.sqlite 複製到專案中。

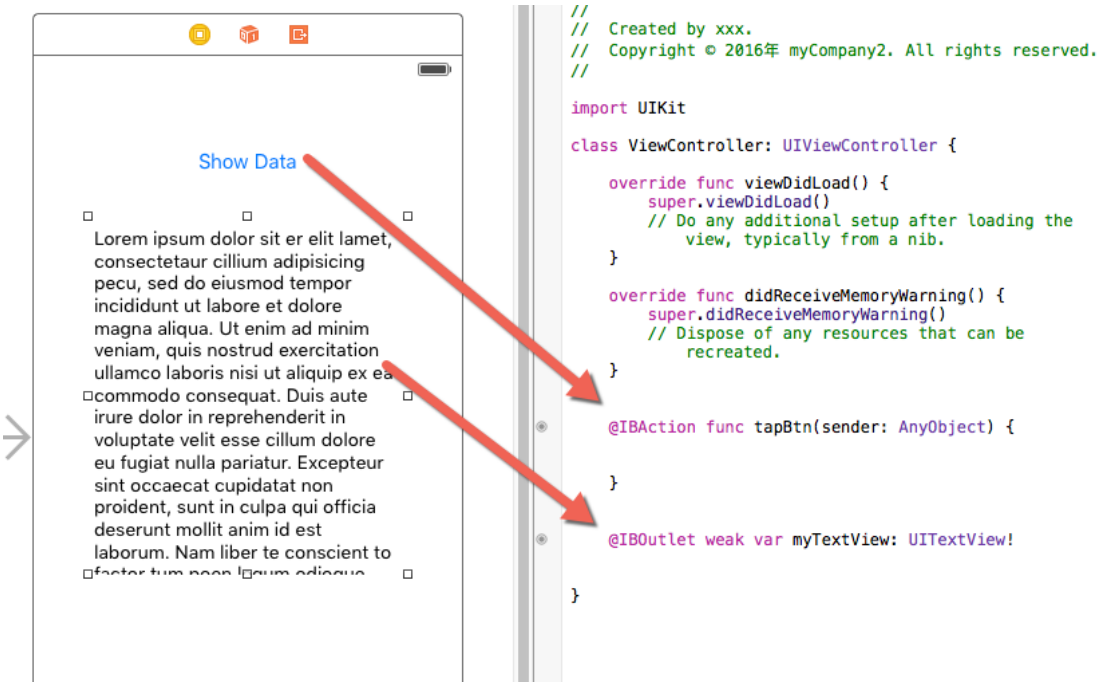

ch.12-3
M
libsqlite3.tbd
ch.12-3
AppDelegate.swift
ViewController.swift
Main.storyboard
Assets.xcassets
LaunchScreen.storybo
Info.plist
BridgingHeader.h
Products
ch.12-3
General
Capal
Basic
Show in Finder
Open with External Editor
Open As
Show File Inspector
New File...
Add Files to “ch.12-3”...
Delete
New Group
New Group from Selection
Sort by Name
Sort by Type
Find in Selected Groups...
Source Control
Project Navigator Help
Debug



Step.6

(1) 於畫面中放置一個 Button 的 IBAction 命名為 tapBtn

(2) 於畫面中放置一個 TextView 的 IBOutlet，命名為 myTextView



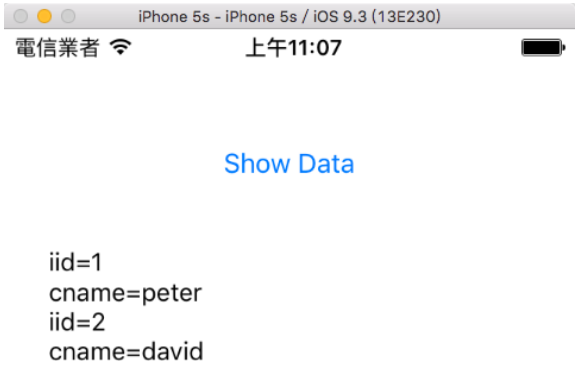
Step.7

(1) 於 tapBtn 的 IBAction 中加入程式碼，用以連結資料庫並將查詢結果顯示於 textView 中。

```
@IBAction func tapBtn(sender: AnyObject) {

    myTextView.text = ""
    var db:COpaquePointer = nil

    let src:String = NSBundle.mainBundle().pathForResource("mydb", ofType: "sqlite")!

    if (sqlite3_open(src, &db) == SQLITE_OK){

        if (db != nil) {
            let sqlString = "SELECT * FROM userdata"

            // statement 用來儲存執行結果
            var statement : COpaquePointer = nil
            if sqlite3_prepare_v2(db, sqlString, -1, &statement, nil) != SQLITE_OK {
                let errmsg = String.fromCString(sqlite3_errmsg(db))
                print("error preparing insert: \(errmsg)")
            }

            //利用迴圈取出查詢結果
            while (sqlite3_step(statement) == SQLITE_ROW) {
                let iid  =  Int(sqlite3_column_int(statement, 0))
                let rowData  = sqlite3_column_text(statement, 1)
                let cname = String.fromCString(UnsafePointer<CChar>(rowData))
                myTextView.text = myTextView.text.stringByAppendingString("iid=\(iid)\n")
                myTextView.text = myTextView.text.stringByAppendingString("cname=\(cname!)\n")
            }

            //使用完畢  釋放statement
            sqlite3_finalize(statement);

        }
        sqlite3_close(db);

    } else {
        let alertController = UIAlertController (title: "開啟失敗", message: "無法開啟資料庫", preferredStyle: .Alert)
        presentViewController(alertController, animated: true, completion: nil)
        exit(1)
    }

}
```

Step.8

當 App 啟動後在顯示畫面時，在點選【Show Data】時，將會查詢資料庫並將結果顯示於文字框中。


iPhone 5s - iPhone 5s / iOS 9.3 (13E230)
電信業者
上午11:07
Show Data
iid=1
cname=peter
iid=2
cname=david