Lab0

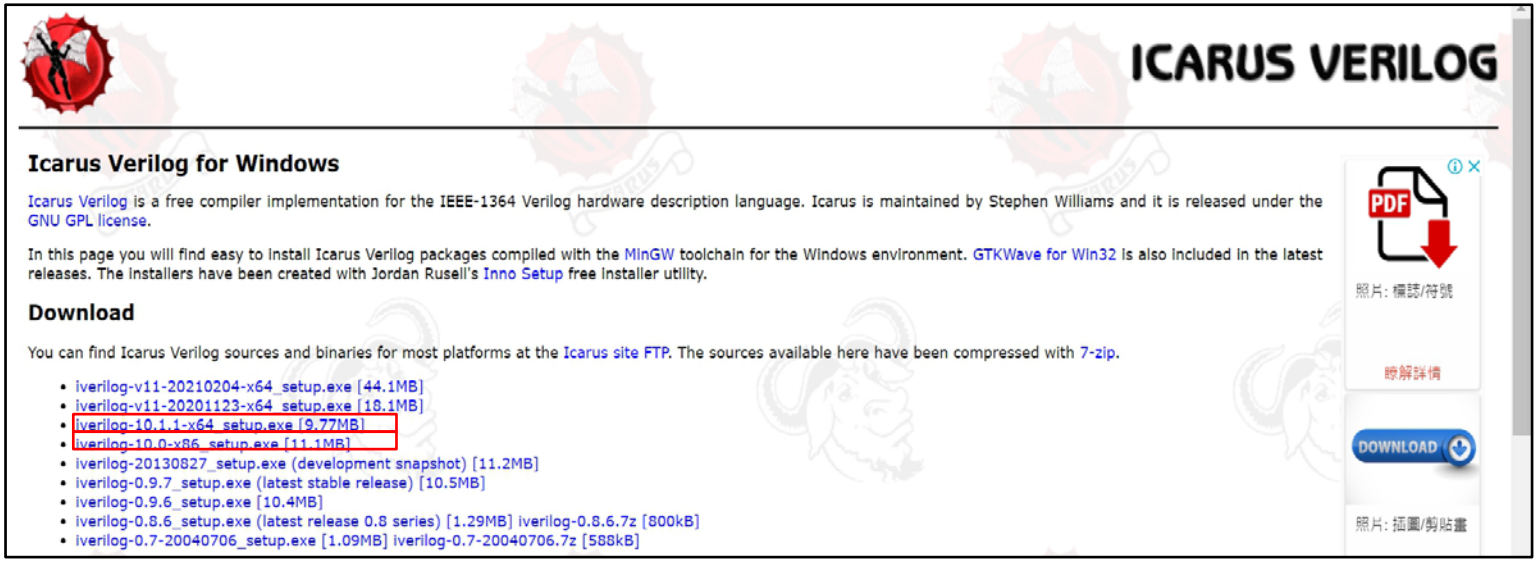
INSTALL IVERILOG & GTKWAVE

Outline

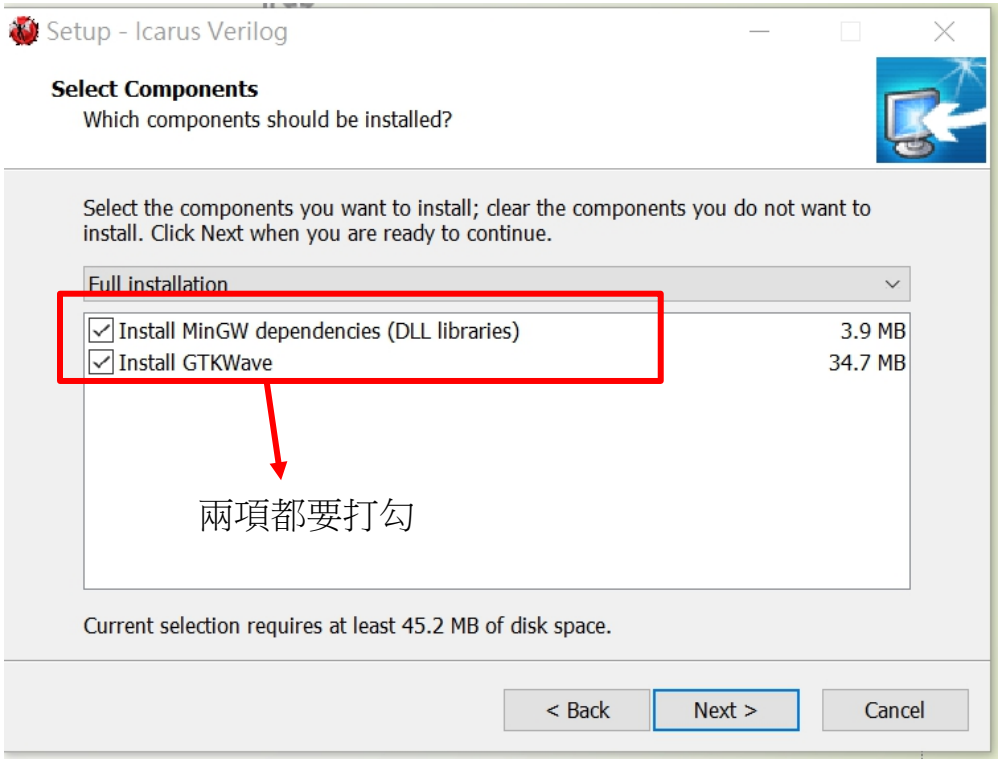
- Windows環境
  - 安裝iverilog&gtkwave
  - 新增環境變數
- MacOS環境
  - 安裝iverilog
  - 安裝gtkwave
- iverilog&gtkwave使用方式
- 撰寫verilog並編譯及執行的步驟

Windows

- 下載網址：http://bleyer.org/icarus/
  - 64 bit：iverilog-10.1.1-x64_setup.exe [9.77MB]
  - 32 bit：iverilog-10.0-x86_setup.exe [11.1MB]



安裝步驟


Setup - Icarus Verilog
Select Components
Which components should be installed?
Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.
Full installation
Install MinGW dependencies (DLL libraries)
3.9 MB
Install GTKWave
34.7 MB
兩項都要打勾
Current selection requires at least 45.2 MB of disk space.
< Back
Next >
Cancel

新增環境變數

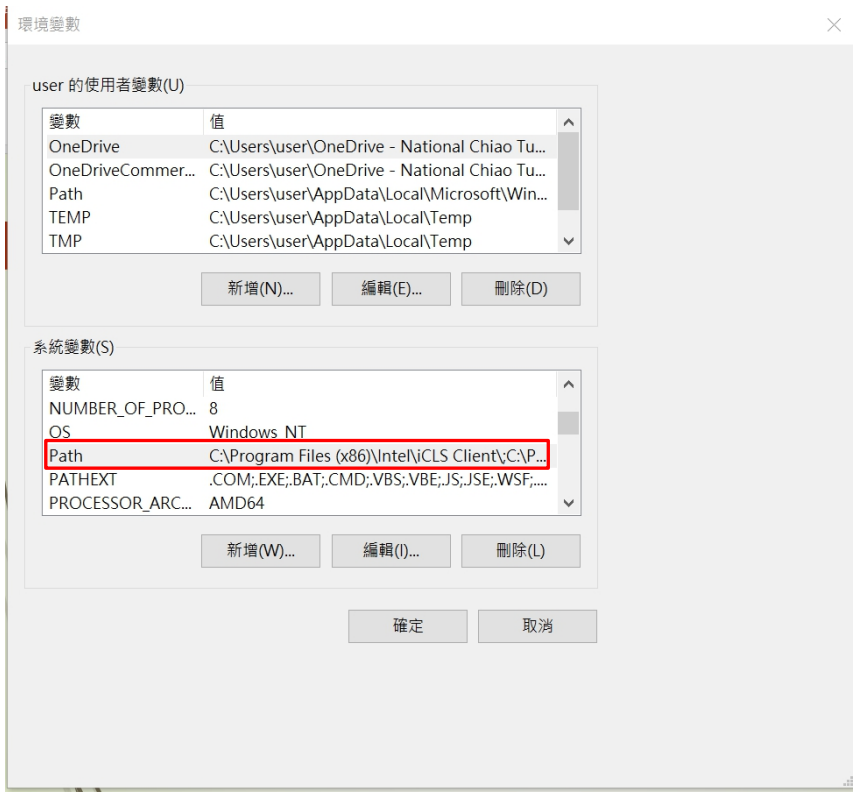
- 打開控制台
- 搜尋「進階系統設定」
- 點選「檢視進階系統設定」

新增環境變數

- 點選「環境變數」

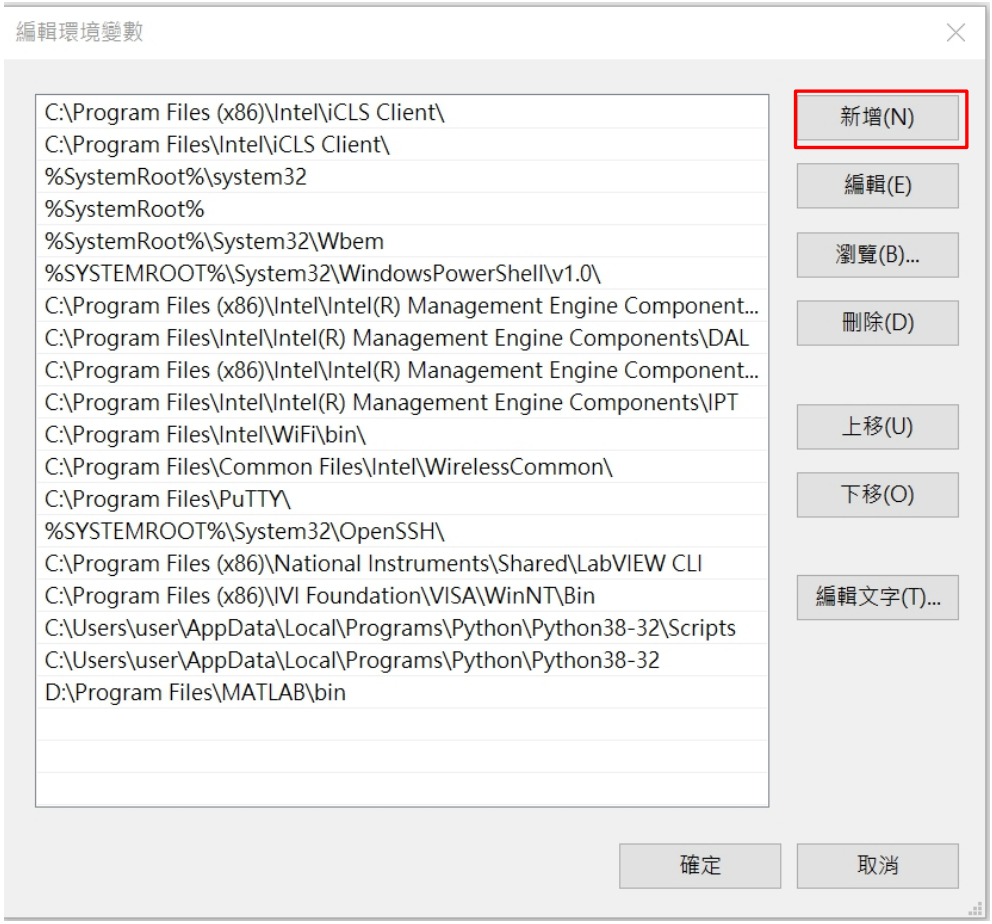
新增環境變數

- 於系統變數中找到「Path」
- 點一下後按編輯



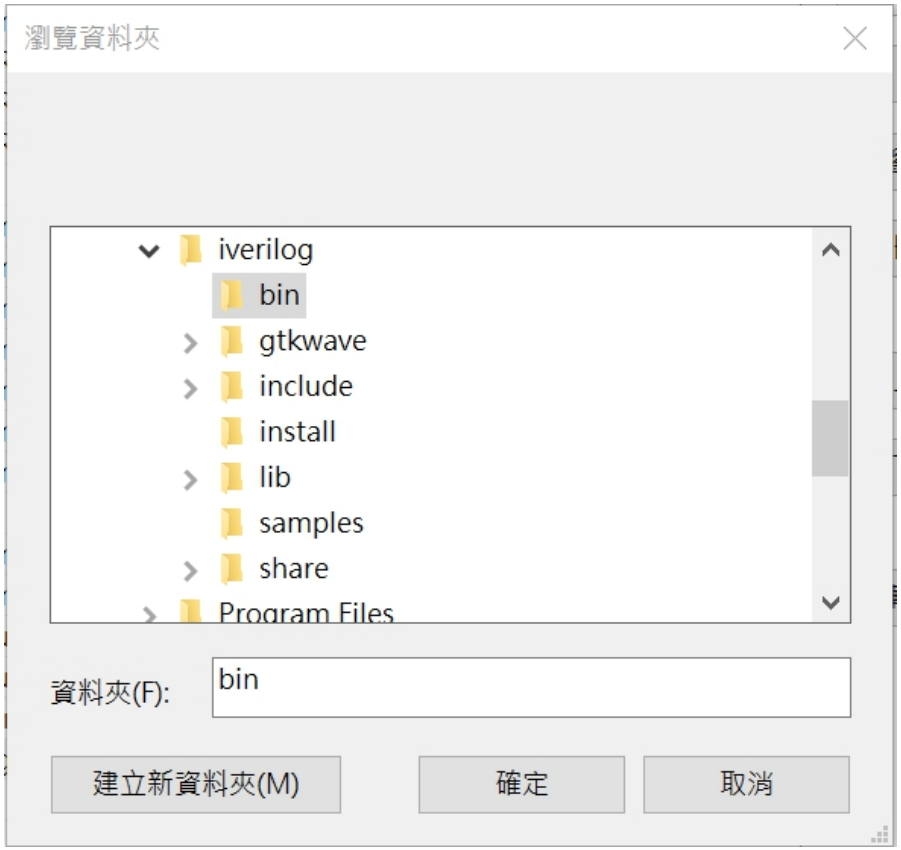
新增環境變數

- 點選「新增」
- 之後點選「瀏覽」



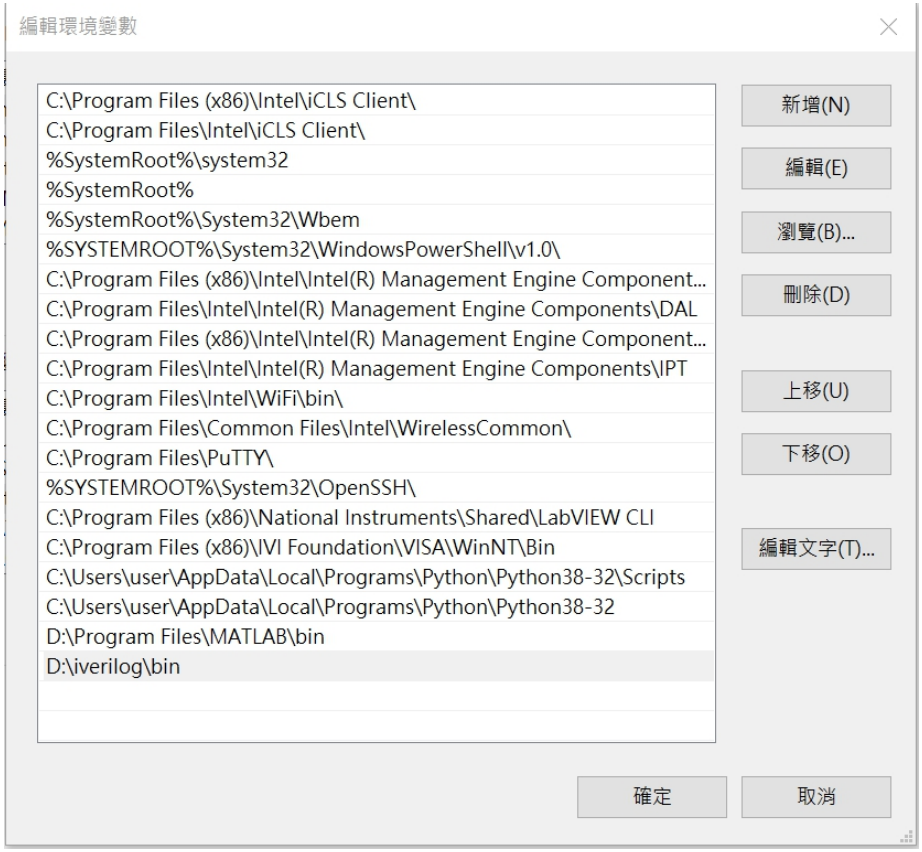
新增環境變數

- 找到iverilog/bin後按確定



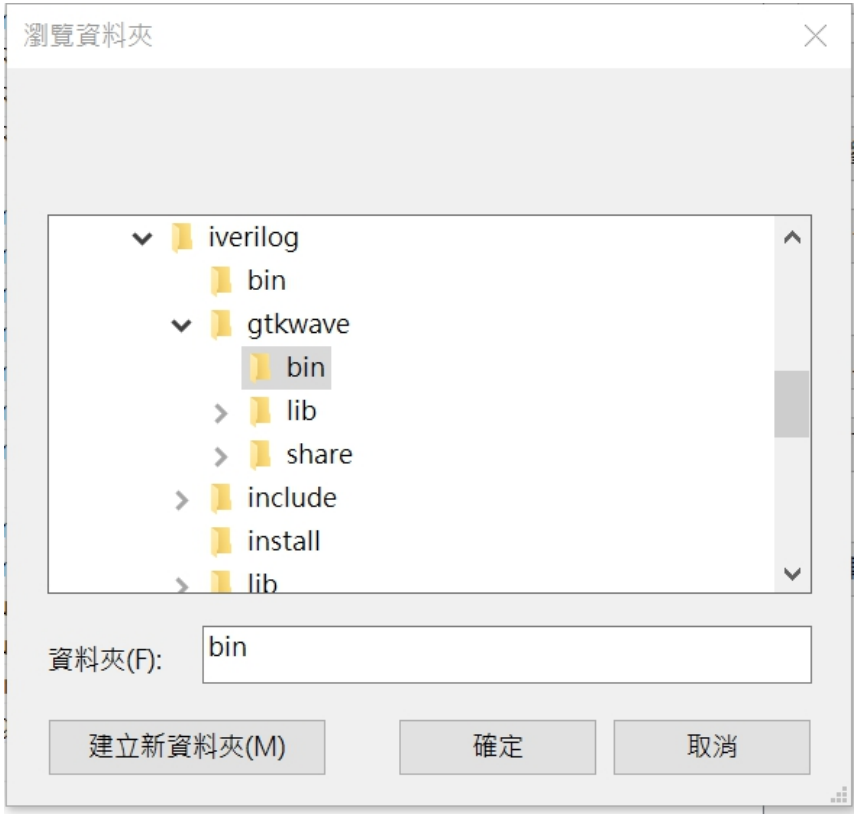
新增環境變數

- 點選「新增」
- 之後點選「瀏覽」



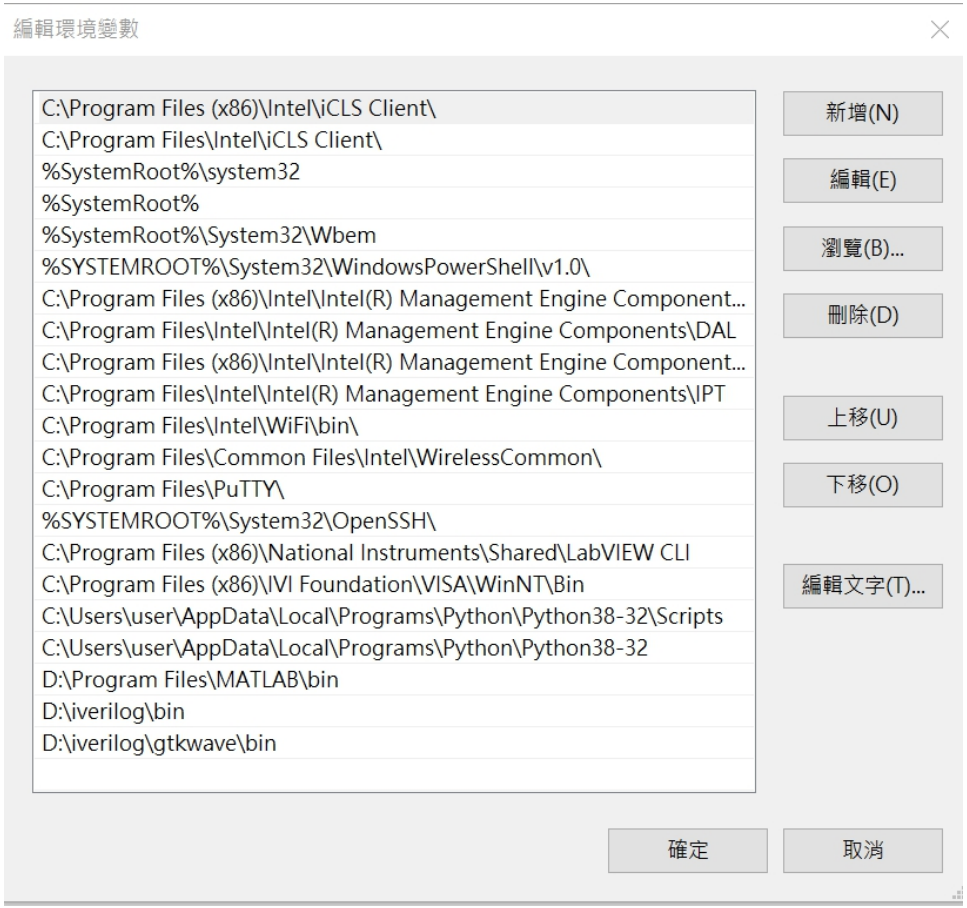
新增環境變數

- 找到iverilog/gtkwave/bin後按確定



新增環境變數

- 按確定後即新增成功
- 之後須將電腦重新啟動



Mac OS-iverilog

- 安装Homebrew
  - $ /usr/bin/ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install)"
- 安装 icarus-Verilog
  - $ brew install icarus-Verilog

```
~ brew install icarus-verilog
==> Downloading https://homebrew.bintray.com/bottles/icarus-verilog-11.0.big_sur.bottle.tar.gz
Already downloaded: /Users/huyufang/Library/Caches/Homebrew/downloads/1a884851278dc1005155256471b110e028ff786e
adc3f6b6940327609ac6c1b4--icarus-verilog-11.0.big_sur.bottle.tar.gz
==> Pouring icarus-verilog-11.0.big_sur.bottle.tar.gz
🍺  /usr/local/Cellar/icarus-verilog/11.0: 56 files, 6.6MB
~ which iverilog
/usr/local/bin/iverilog
```

版本過舊問題

- 若安裝過程遇到 CLT (CommandLineTools) 版本過舊的問題：
  - 可以執行下面兩條指令解決
    - ✓ $ sudo rm -rf /Library/Developer/CommandLineTools　# 刪除原有的CLT
    - ✓ $ sudo xcode-select --install　# 安裝新的CLT

```
Error: Your CLT does not support macOS 11.2.
It is either outdated or was modified.
Please update your CLT or delete it if no updates are available.
```

Mac OS-gtkwave

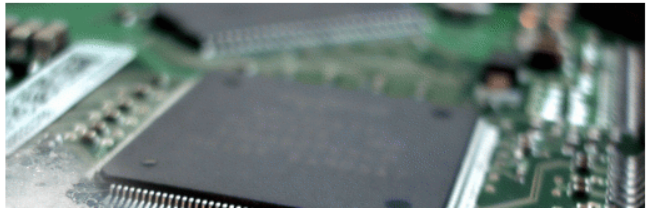
- 下載網址：http://gtkwave.sourceforge.net/

Welcome to GTKWave

GTKWave is a fully featured GTK+ based wave viewer for Unix, Win32, and Mac OSX which reads LXT, LXT2, VZT, FST, and GHW files as well as standard Verilog V
Documentation in pdf format can be found here.

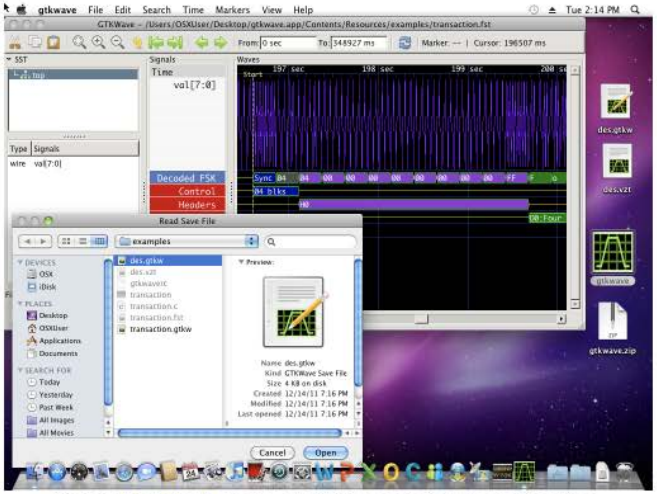
For svn access to the experimental, pre-release sourcetree on Sourceforg
svn checkout svn://svn.code.sf.net/p/gtkwave/code/ gtkwave-code

Native Win32 and OSX binaries are available here, however if you are a Windows user running Cygwin, running under that is recommended instead.
A Mac port can be found both here and here.
Ports to other platforms which GTK supports should be trivial.



Mac OS-gtkwave

- 點選 download



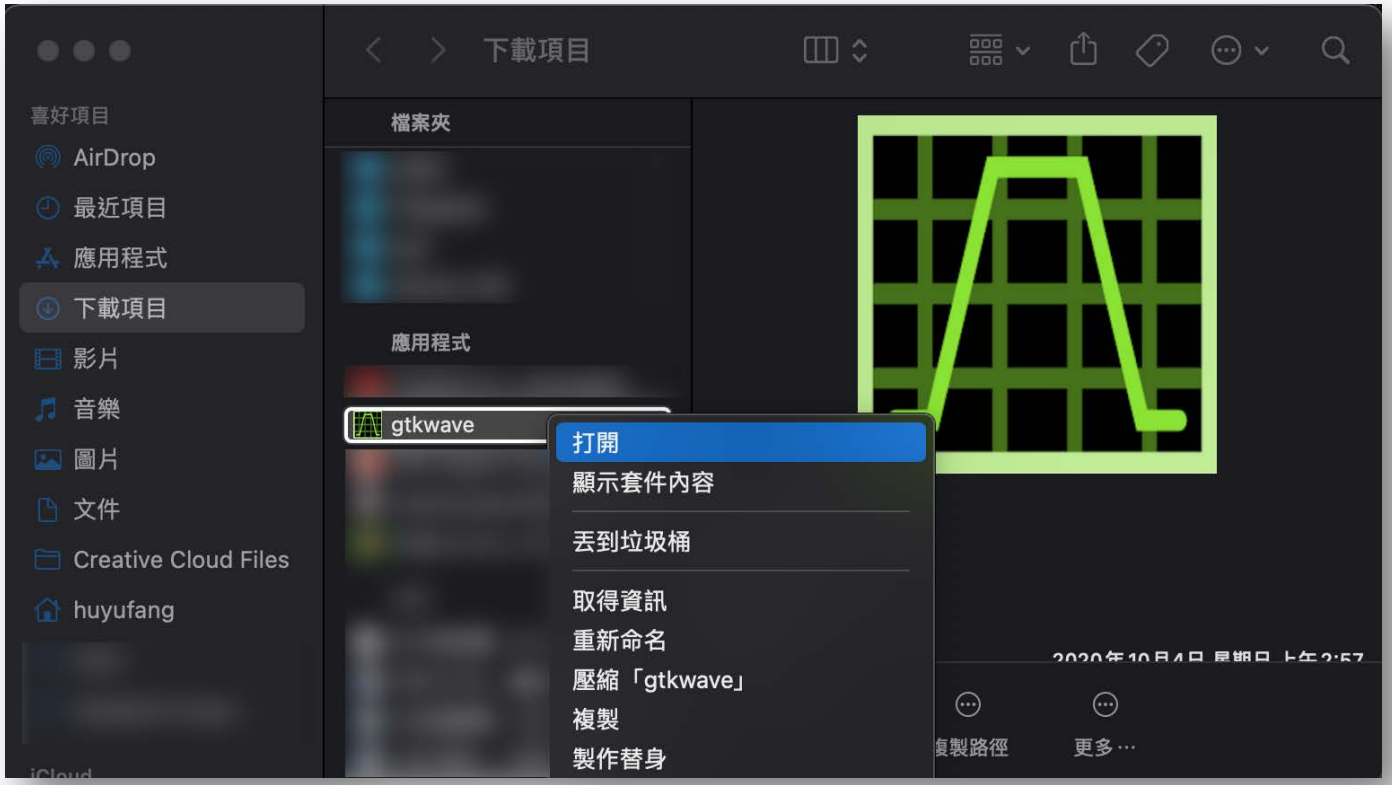
Simply download, unzip, and it is ready to run on the Mac...

Mac OS-gtkwave

- 解壓縮 gtkwave.zip，會看到應用程式 gtkwave

Mac OS-gtkwave

- 按住 control ，打開 gtkwave



Mac OS-gtkwave

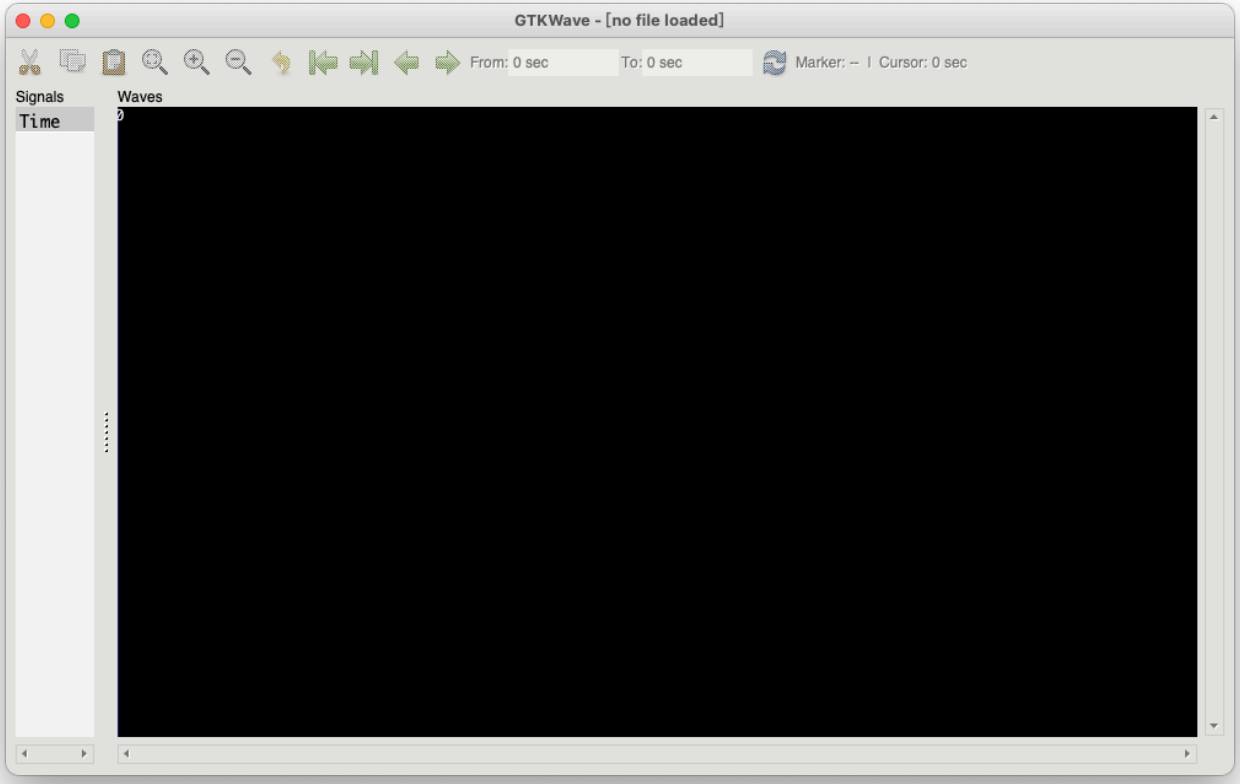
- 接著會跳出警告視窗，點選打開

Mac OS-gtkwave

- 接著會跳出警告視窗，點選打開

Mac OS-gtkwave

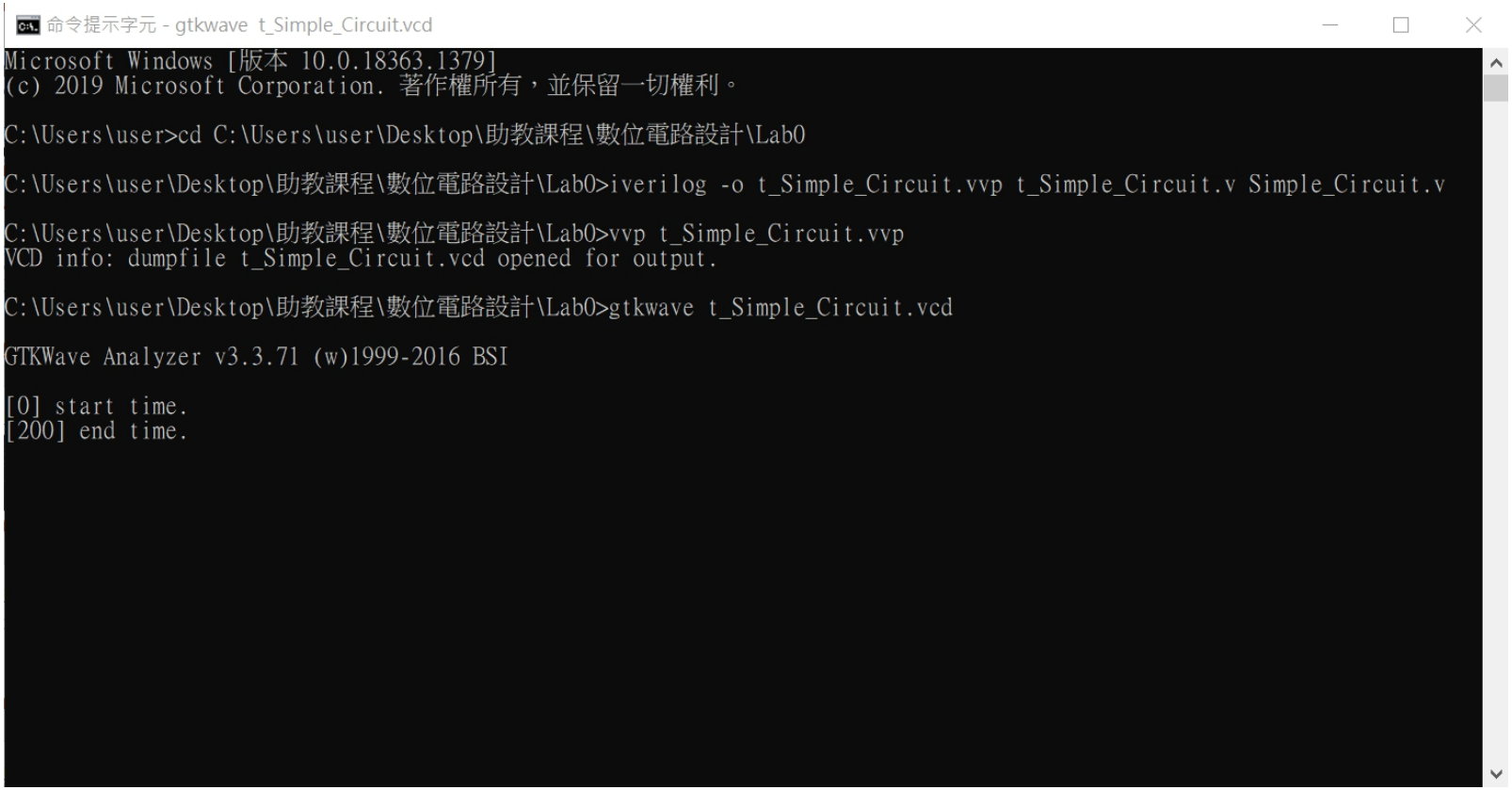
- 完成



使用 iverilog & gtkwave

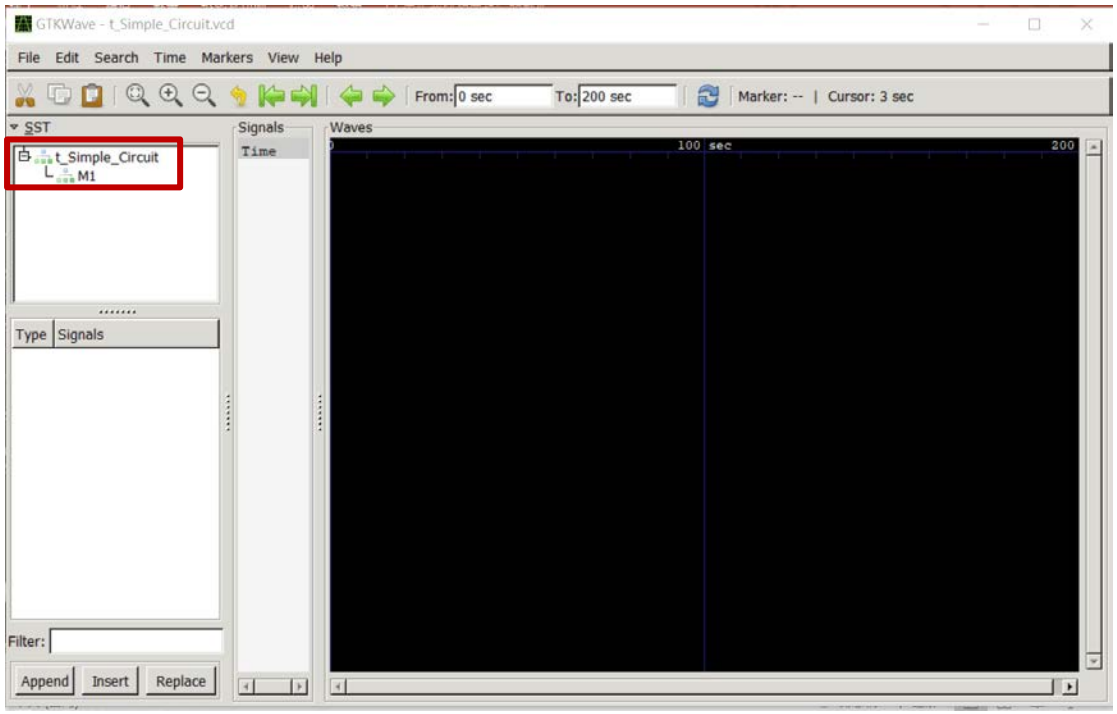
- 打開「命令提示字元」(終端機)
- 使用cd [路徑]到達Simple_Circuit.v 和 t_Simple_Circuit.v所在資料夾
- iverilog –o t_Simple_Circuit.vvp t_Simple_Circuit.v Simple_Circuit.v
- vvp t_Simple_Circuit.vvp
- gtkwave t_Simple_Circuit.vcd

使用 iverilog & gtkwave



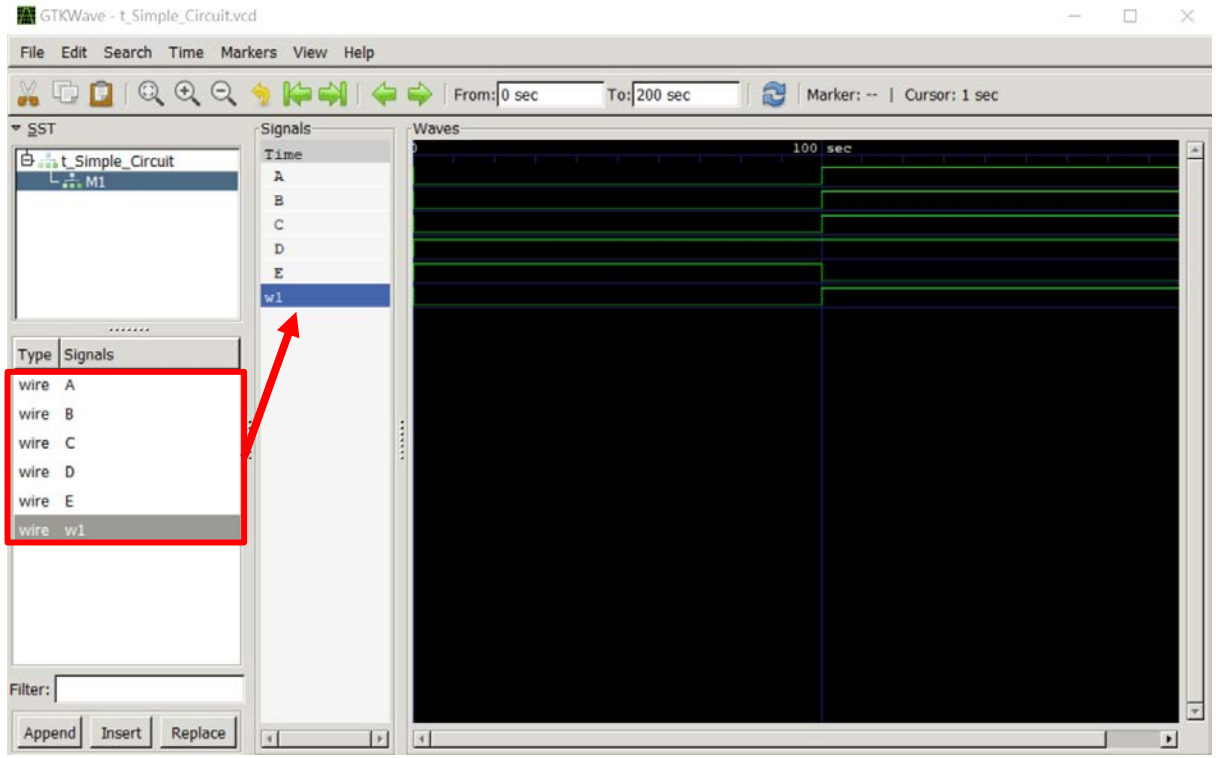
使用 iverilog & gtkwave

- gtkwave視窗出現之後
- 點選t_Simple_Circuit旁邊的+
- 點選M1



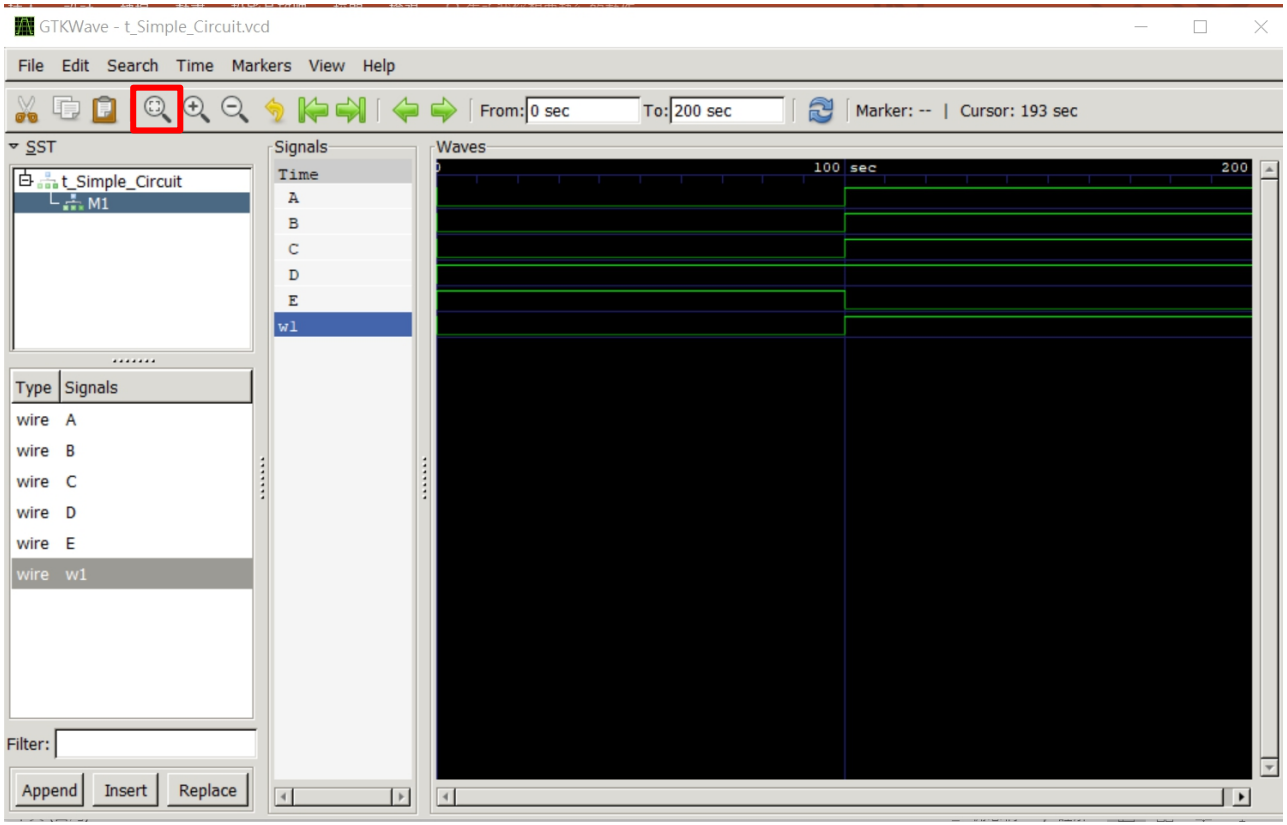
使用 iverilog & gtkwave

- 下方會出現五個變數
- 分別將這五個變數拖至Signals



使用 iverilog & gtkwave

- 點選左上方的  讓波型以最適合螢幕大小的方式顯示



寫Verilog編譯並執行步驟

- 使用任意文字編輯器撰寫module及testbench並將副檔名皆存成.v
  - E.g. notepad++、VSCode等
- 撰寫testbench務必於initial begin之後加入
  - $dumpfile("檔名A.vcd");
  - $dumpvars;
- 打開命令提示字元
  - 使用cd [路徑]到達.v所在資料夾
  - iverilog –o 檔名B.vvp testbench檔名.v module檔名.v
  - vvp 檔名.vvp
  - gtkwave 檔名A.vcd