

# CS410000 Computer Architecture - HW1

鄭翔駿

TTLAB

2022/09/19

## 申請工作站帳號

- 請同學自行填寫表單申請。
- **\*\*第一次登入請使用 yppasswd 修改密碼\*\***

- 指導老師或授課老師  
Instructor/Advisor: 黃婷婷
- 申請帳號類別 Account Type:  
課程修課學生 course student
- 科號 Course Number: CS410000



Figure 1: [申請連結](#)

# 作業說明

本次作業將進行 Benchmark  
測量與比較，並計算 Speedup。  
將測量結果與截圖紀錄於 hw1.docx 中。

## CS 410000 Computer Architecture Homework 1

(Due: 2022-09-26 23:59:59)

[學號] [姓名]

Please evaluate your computer performance by executing the following benchmarks, and fill the blanks of table. In addition, basic hardware information of your computer has to be reported too. You can download the benchmark source code from eeclass, and re-compile them for your Linux system.

### Compile Instructions

- 1) Change directories to "src" of benchmarks. (eq. SPEC2000\_55/CINT2000/164.gzip/src)
- 2) Make sure your gcc location in *Makefile.defaults* (eq. cc=gcc), and type "make",
- 3) Execute the "./run" script, and report your program elapsed time.

Reference machine information	
Processor model	Intel(R) Core(TM) i5-8400 CPU @ 2.80GHz
Memory size	32 GB
Operating system (OS)	Ubuntu 18.04.5 LTS

Figure 2: hw1.docx

# Step1

- 從 eeclass 的作業資訊中下載本次作業檔案 SPEC2000\_SS.zip，並上傳至工作站解壓縮。

## CAD 工作站

- Host: nthucad.cs.nthu.edu.tw
- port: 22

# Step1 - Windows

## ● PieTTY or PuTTY / FileZilla



Figure 3: PieTTY

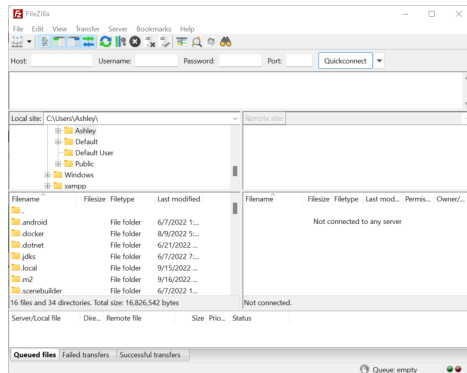


Figure 4: FileZilla

## Step1 - Mac / Linux

● ssh / scp or sftp

ssh

```
$ ssh [user]@nthucad.cs.nthu.edu.tw
```

```
$ ssh hccheng22@nthucad.cs.nthu.edu.tw
```

scp / sftp

```
$ scp [file] [user]@nthucad.cs.nthu.edu.tw:[path]
```

```
$ scp SPEC2000_SS.zip hccheng22@nthucad.cs.nthu.edu.tw:.
```

```
$ sftp [user]@nthucad.cs.nthu.edu.tw
```

```
$ sftp hccheng22@nthucad.cs.nthu.edu.tw
```

```
sftp> put SPEC2000_SS.zip
```

## Step2

```
New release '22.04.1 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Your Hardware Enablement Stack (HWE) is supported until April 2025.  
Last login: Sat Sep 17 11:52:29 2022 from 111.249.159.87
```

NTHU  
VLSI/CAD

Host	processor number	freq / # of core	Ram	OS
ic21	AMD EPYC 7282	2.80GHz/16C32Tx2	256G	CentOS 7.9
ic22	AMD EPYC 7282	2.80GHz/16C32Tx2	192G	CentOS 7.9
* ic51	Xeon(R) Gold 6226R	2.90GHz/16C32Tx2	128G	CentOS 7.9
* ic55	Xeon(R) Gold 6226R	2.90GHz/16C32Tx2	128G	CentOS 6.10
* ic56	AMD EPYC 7543	2.80GHz/32C64Tx2	256G	CentOS 7.9

\*(Recommended if you don't have special requirements.)

本次作業請同學使用

CAD 工作站 ic56 與 hw1.docx 中  
提供的參考結果進行比較。

```
$ ssh ic56
```

Figure 5: CAD Server List

## Step3

- 使用以下指令查看系統資訊，並紀錄於報告中。

### CPU

```
$ grep "model name" /proc/cpuinfo
```

### Memory

```
$ grep MemTotal /proc/meminfo
```

### Operating System

```
$ cat /etc/os-release
```



## Step4

- SPEC2000\_SS/CINT2000 資料夾中共包含五個 Benchmark ，本次作業僅需跑 164.gzip 、175.vpr 和 181.mcf

```
nthucad:~/SPEC2000_SS> ls
CINT2000  Makefile.defaults  Makefile.defaults~
nthucad:~/SPEC2000_SS> cd CINT2000/
nthucad:~/SPEC2000_SS/CINT2000> ls
164.gzip 175.vpr 181.mcf 256.bzip2 300.twolf
```

Figure 6: SPEC2000\_SS/CINT2000

## Step5

以 256.bzip2 為例

- 使用 make 進行編譯、產生執行檔，並將執行 make 後的結果截圖紀錄於報告中。

```
nthucad:~/SPEC2000_SS/CINT2000> cd 256.bzip2/src/  
nthucad:~/SPEC2000_SS/CINT2000/256.bzip2/src> make  
gcc -c -o bzip2.o          bzip2.c  
gcc -c -o spec.o           spec.c
```

Figure 7: make

## Step6

- 最後請執行 script
- 使用 bash run  
，並將執行結果截圖紀錄於報告中。
- 將 real time 填入報告中的  
execution time。

```
nthucad:~/SPEC2000_SS/CINT2000/256.bzip2/src> bash run
spec_init
Loading Input Data
Input data 2097152 bytes in length
Compressing Input Data, level 7
Compressed data 2107853 bytes in length
Uncompressing Data
Uncompressed data 2097152 bytes in length
Uncompressed data compared correctly
Compressing Input Data, level 9
Compressed data 2106855 bytes in length
Uncompressing Data
Uncompressed data 2097152 bytes in length
Uncompressed data compared correctly
Tested 2MB buffer: OK!

real    0m3.093s
user    0m3.087s
sys     0m0.005s
```

Figure 8: run script

# 作業繳交

- Due Date: **2022/09/26 23:59:59**
- 請從 eeclass 下載 hw1.docx 填入所有空格以及截圖
- 並將檔名改成 hw1\_學號.docx
- 完成後上傳至 eeclass
- **\*\*禁止抄襲\*\***

# 聯絡方式

如果對本次作業有任何疑問，請以下列方式聯絡助教。

鄭翔駿

- 資電館227
- email: jimmy980189@gmail.com

- eeclass 討論區

# Reference

- [PieTTY project - Google Sites](#)
- [FileZilla - The free FTP solution](#)
- [ssh\(1\): OpenSSH SSH client - Linux man page - Die.net](#)
- [scp\(1\): secure copy - Linux man page - Die.net](#)
- [sftp\(1\): secure file transfer program - Linux man page - Die.net](#)