

# 实验四环境配置

## Linux

1. 自行创建虚拟机 (VMware Workstation、Virtual Box、WSL) , 下面以Ubuntu为例。
2. 自行添加或更换软件源
3. 安装python: `sudo apt install python` 或 `sudo apt install python3`
4. 安装pip: `sudo apt install pip`
5. 安装gcc及make环境: `sudo apt install build-essential`
6. 安装colorama模块: `pip install colorama`
7. 若使用python3, 将run文件首行改为 `#!/usr/bin/python3`
8. 为sim和basesim添加权限: (需要先make 生成sim文件)

```
sudo chmod +x sim          sudo chmod +x basesim
```

9. 调试实验程序

```
root@ubuntu:/home/noda/Desktop/lab4# ./sim ./inputs/inst/sb.x
MIPS Simulator

Read 7 words from program into memory.

MIPS-SIM> ?

-----MIPS ISIM Help-----
go                - run program to completion
run n             - execute program for n instructions
rdump(rd)         - dump architectural registers
mdump low high    - dump memory from low to high
input reg_no reg_value - set GPR reg_no to reg_value
?                 - display this help menu
quit              - exit the program

MIPS-SIM> input 1 123456

1 123456
MIPS-SIM> mdump 0 4

Memory content [0x00000000..0x00000004] :
-----
0x00000000 (0) : 0x00000000
0x00000004 (4) : 0x00000000

MIPS-SIM> rdump

PC: 0x00400000
R0: 0x00000000
R1: 0x0001e240
```

9. 运行检查脚本

```

root@ubuntu:/home/noda/Desktop/lab4# make run
rm -rf *.o sim sim.exe
gcc -g -O2 src/shell.c src/pipe.c -o sim
Testing: inputs/medium/additest.x
  Stats          BaselineSim      YourSim
R0           0x00000000      0x00000000
R1           0x00000000      0x00000000
R2           0x0000000a      0x0000000a
R3           0x00005678      0x00005678
R4           0x00000000      0x00000000
R5           0x00000000      0x00000000
R6           0x00000000      0x00000000
R7           0x00000000      0x00000000
R8           0x000004d2      0x000004d2
R9           0x000015b3      0x000015b3
R10:         0x000015b3      0x000015b3
R11:         0x00000000      0x00000000
R12:         0x00000000      0x00000000
R13:         0x00000000      0x00000000
R14:         0x00000000      0x00000000
R15:         0x00000000      0x00000000
R16:         0x00000000      0x00000000
R17:         0x00000000      0x00000000
R18:         0x00000000      0x00000000
R19:         0x00000000      0x00000000
R20:         0x00000000      0x00000000
R21:         0x00000000      0x00000000
R22:         0x00000000      0x00000000
R23:         0x00000000      0x00000000
R24:         0xffff8000      0xffff8000
R25:         0xffff8000      0xffff8000
R26:         0x00000000      0x00000000
R27:         0x00000000      0x00000000
R28:         0x00000000      0x00000000
R29:         0x00000000      0x00000000
R30:         0x00000000      0x00000000
R31:         0x00000000      0x00000000
HI:         0x00000000      0x00000000
LO:         0x00000000      0x00000000
Cycles              120              18
FetchedInstr         18              18
RetiredInstr         12              12
IPC                  0.100          0.667
Flushes              1                1
REGISTER CONTENTS OK

```

## Windows

1. 自行安装python2.7以上版本: <https://www.python.org/>
2. 安装gcc及make工具, 下面以MinGW为例: <https://www.mingw-w64.org/>
3. 将python和MinGW路径都添加到环境变量。
4. 为mingw32-make.exe创建副本, 并重命名为make.exe

此电脑 > 本地磁盘 (C:) > MinGW > bin

名称	修改日期	类型	大小
make.exe	2012/9/2 8:42	应用程序	215 KB
mingw32-c++.exe	2017/5/30 4:59	应用程序	975 KB
mingw32-g++.exe	2017/5/30 4:59	应用程序	975 KB
mingw32-gcc.exe	2017/7/25 1:03	应用程序	973 KB
mingw32-gcc-6.3.0.exe	2017/7/25 1:03	应用程序	973 KB
mingw32-gcc-ar.exe	2017/7/25 1:03	应用程序	70 KB
mingw32-gcc-nm.exe	2017/7/25 1:03	应用程序	70 KB
mingw32-gcc-ranlib.exe	2017/7/25 1:03	应用程序	70 KB
mingw32-make.exe	2012/9/2 8:42	应用程序	215 KB

##### 5. 调试实验程序

```
PS D:\Code\lab4> ./sim ./inputs/inst/sw.x
MIPS Simulator

Read 7 words from program into memory.

MIPS-SIM> ?

-----MIPS ISIM Help-----
go                - run program to completion
run n             - execute program for n instructions
rdump(rd)         - dump architectural registers
mdump low high    - dump memory from low to high
input reg_no reg_value - set GPR reg_no to reg_value
?                 - display this help menu
quit              - exit the program

MIPS-SIM>
```

##### 6. 运行检查脚本

```
Windows PowerShell
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安装最新的 PowerShell, 了解新功能和改进! https://aka.ms/PSWindows

PS D:\Code\lab4> make run
del *.o sim sim.exe
gcc -g -O2 src/pipe.c src/shell.c -o sim
Testing: inputs/branch/test1.x
Stats      BaselineSim      YourSim
R0          0x00000000      0x00000000
R1          0x00000000      0x00000000
R2          0x0000000a      0x0000000a
R3          0x00000000      0x00000000
R4          0x00000000      0x00000000
R5          0x00000000      0x00000000
R6          0x00000000      0x00000000
R7          0x00000000      0x00000000
R8          0x00000000      0x00000000
R9          0x00000003      0x00000003
R10:        0x00000005      0x00000005
R11:        0x00000011      0x00000011
R12:        0x00000001      0x00000001
R13:        0x00000000      0x00000000
R14:        0x00000000      0x00000000
R15:        0x00000000      0x00000000
R16:        0x0000003a      0x0000003a
R17:        0x00000000      0x00000000
R18:        0x00000000      0x00000000
R19:        0x00000000      0x00000000
```