MSDM5001: Homework1

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the version of operating system: Ubuntu 20.04.1 LTS
the version of bash/python: 5.0.17(1)
additional libraries or packages: tree
Git clone: https://github.com/Chen190842/MSDM5001HW1.git

1. Linux operating system and memory hierarchy
1)

2)

lscpu:

gather CPU architecture information from sysfs.

free:

get a detailed report on the system's memory usage.

```
chy@chy-VirtualBox:~$ free
           总计        已用        空闲        共享    缓冲/缓存      可用
内存:    3053356     699952     1314160       5340     1039244    2178472
交换:     459260          0      459260
```
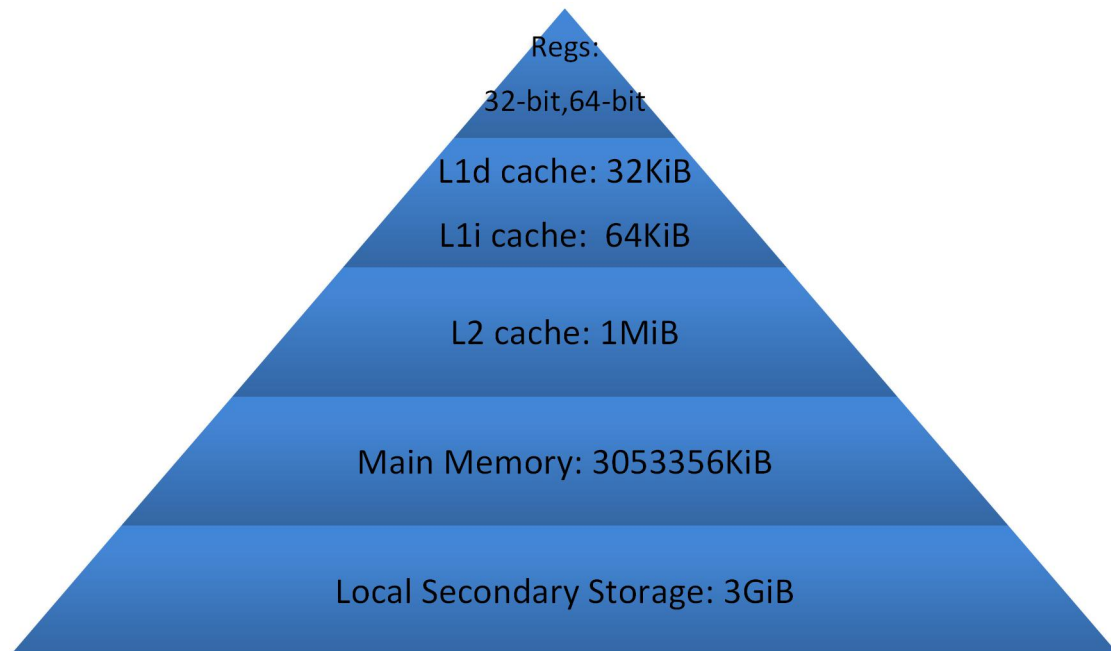
sudo lshw -C memory:

show specifics on system memories.

```
chy@chy-VirtualBox:~/桌面$ sudo lshw -C memory
[sudo] chy 的密码:
  *-firmware
       description: BIOS
       vendor: innotek GmbH
       physical id: 0
       version: VirtualBox
       date: 12/01/2006
       size: 128KiB
       capacity: 128KiB
       capabilities: isa pci cdboot bootselect int9keyboard int10video acpi
  *-memory
       description: System memory
       physical id: 1
       size: 3GiB
```

Memory hierarchy:

Regs:
32-bit,64-bit

L1d cache: 32KiB
L1i cache: 64KiB

L2 cache: 1MiB

Main Memory: 3053356KiB

Local Secondary Storage: 3GiB

3)

```
chy@chy-VirtualBox:~/桌面$ cd /; tree | head -n 15
.
├── bin -> usr/bin
├── boot
│   ├── config-5.4.0-42-generic
│   ├── config-5.4.0-48-generic
│   ├── efi [error opening dir]
│   ├── grub
│   │   ├── fonts
│   │   │   └── unicode.pf2
│   │   ├── gfxblacklist.txt
│   │   ├── grub.cfg
│   │   ├── grubenv
│   │   ├── i386-pc
│   │   │   ├── 915resolution.mod
│   │   │   ├── acpi.mod
chy@chy-VirtualBox:/$
```

cd /; tree | head -n 15:

show the top 15 lines of all directories of the system in a tree-like format

2. Bash script

createfile: Changing the permission using 'chmod +x createfile'. Run this bash script in Ubuntu terminal using: ./ createfile, it will create 100 requested files in the current path.

Bash script 'createfile' content:

```bash
#!/bin/bash
for i in {1..100}
do
mkdir -p DDM$i
touch DDM$i/time_till_now.txt
cd DDM$i/
echo "nanoseconds since 1970-01-01 00:00:00 UTC:" >> time_till_now.txt
echo "< $(date +%s%N) >" >> time_till_now.txt
cd ..
done
```

Result:

3. Regular expression

blocklistfind: Using cd command in Ubuntu terminal to go to the path where contains file

'blocklist.xml'. Changing the permission using 'chmod +x blocklistfind'. Running this bash script using: ./ blocklistfind, it will create 2 txt files containing the requested information in the current path.

Bash script 'blocklistfind' content:

```
#!/bin/bash
egrep "blockID=\"i[0-9]{3}"    blocklist.xml > blockfindig.txt
egrep "blockID=\"g[0-9]{3}" blocklist.xml >> blockfindig.txt
grep "@" blocklist.xml | grep "." | grep -v [-^] > blockfindmail.txt
```

Results:
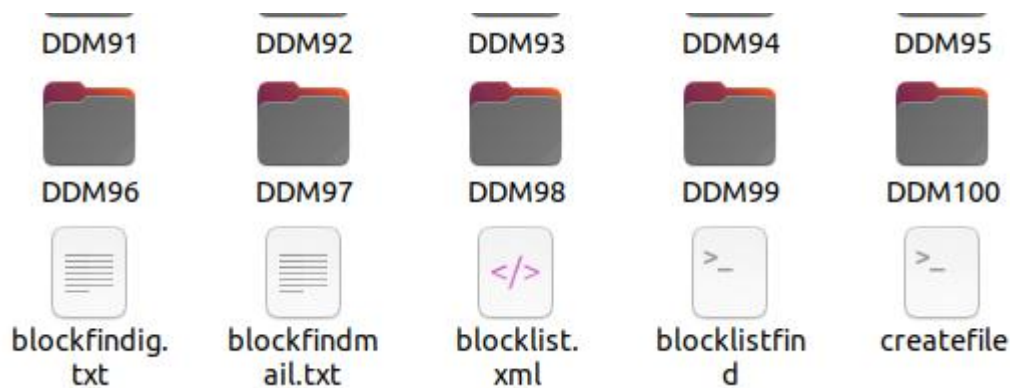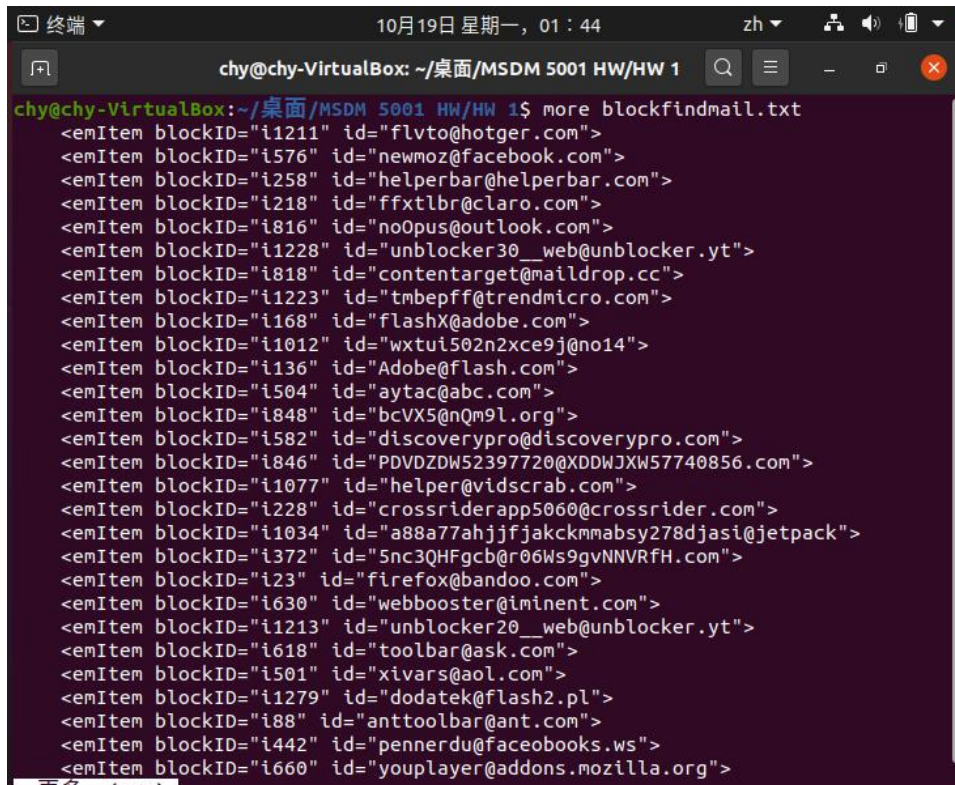
1)

The result is saved in 'blockfindig.txt', use 'more blockfindig.txt' in Ubuntu terminal in the path where contains the txt file to show the results.

2)

The result is saved in 'blockfindmail.txt', use 'more blockfindmail.txt' in Ubuntu terminal in the path where contains the txt file to show the results.