

# 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)

```
top - 18:37:22 up 7 min, 1 user, load average: 0.37, 1.38, 0.90
任务: 171 total, 1 running, 170 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.7 us, 0.0 sy, 0.0 ni, 99.3 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 2981.8 total, 1283.6 free, 683.7 used, 1014.5 buff/cache
MiB Swap: 448.5 total, 448.5 free, 0.0 used, 2127.2 avail Mem

 进程号  USER      PR    NI   VIRT   RES    SHR   %CPU  %MEM   TIME+  COMMAND
    1063  chy        20     0 3447320 315012 129272 S    0.7   10.3   0:25.15  gnome-+
      250  root       -51     0      0      0      0 S    0.3    0.0   0:00.10  irq/18+
      768  chy        20     0  225888  59668  35972 S    0.3    2.0   0:08.18  Xorg
     2114  chy        20     0 1050304  65512  49244 S    0.3    2.1   0:01.46  gnome-+
        1  root       20     0  103328  12904  8404 S    0.0    0.4   0:03.58  systemd
        2  root       20     0      0      0      0 S    0.0    0.0   0:00.00  kthrea+
        3  root       0  -20      0      0      0 I    0.0    0.0   0:00.00  rcu_gp
        4  root       0  -20      0      0      0 I    0.0    0.0   0:00.00  rcu_pa+
        5  root       20     0      0      0      0 I    0.0    0.0   0:00.04  kworke+
        6  root       0  -20      0      0      0 I    0.0    0.0   0:00.00  kworke+
        8  root       20     0      0      0      0 I    0.0    0.0   0:00.01  kworke+
        9  root       0  -20      0      0      0 I    0.0    0.0   0:00.00  mm_per+
       10  root       20     0      0      0      0 S    0.0    0.0   0:00.50  ksoftt+
       11  root       20     0      0      0      0 I    0.0    0.0   0:01.10  rcu_sc+
       12  root       rt      0      0      0      0 S    0.0    0.0   0:00.00  migrat+
       13  root       -51     0      0      0      0 S    0.0    0.0   0:00.00  idle_i+
       14  root       20     0      0      0      0 S    0.0    0.0   0:00.00  cpuhp/0
       15  root       20     0      0      0      0 S    0.0    0.0   0:00.00  kdevtm+
       16  root       0  -20      0      0      0 I    0.0    0.0   0:00.00  netns
       17  root       20     0      0      0      0 S    0.0    0.0   0:00.00  rcu_ta+
       18  root       20     0      0      0      0 S    0.0    0.0   0:00.00  kauditd
       19  root       20     0      0      0      0 S    0.0    0.0   0:00.00  khungt+
```

2)

lscpu:

gather CPU architecture information from sysfs.

```
chy@chy-VirtualBox:~$ lscpu
架构: x86_64
CPU 运行模式: 32-bit, 64-bit
字节序: Little Endian
Address sizes: 48 bits physical, 48 bits virtual
CPU: 1
在线 CPU 列表: 0
每个核的线程数: 1
每个座的核数: 1
座: 1
NUMA 节点: 1
厂商 ID: AuthenticAMD
CPU 系列: 21
型号: 112
型号名称: AMD A9-9410 RADEON R5, 5 COMPUTE CORES 2C+3G
步进: 0
CPU MHz: 2894.572
BogoMIPS: 5789.14
超管理器厂商: KVM
虚拟化类型: 完全
L1d 缓存: 32 KiB
L1i 缓存: 64 KiB
L2 缓存: 1 MiB
NUMA 节点0 CPU: 0
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
```

free:

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

```
chy@chy-VirtualBox:~$ free
```

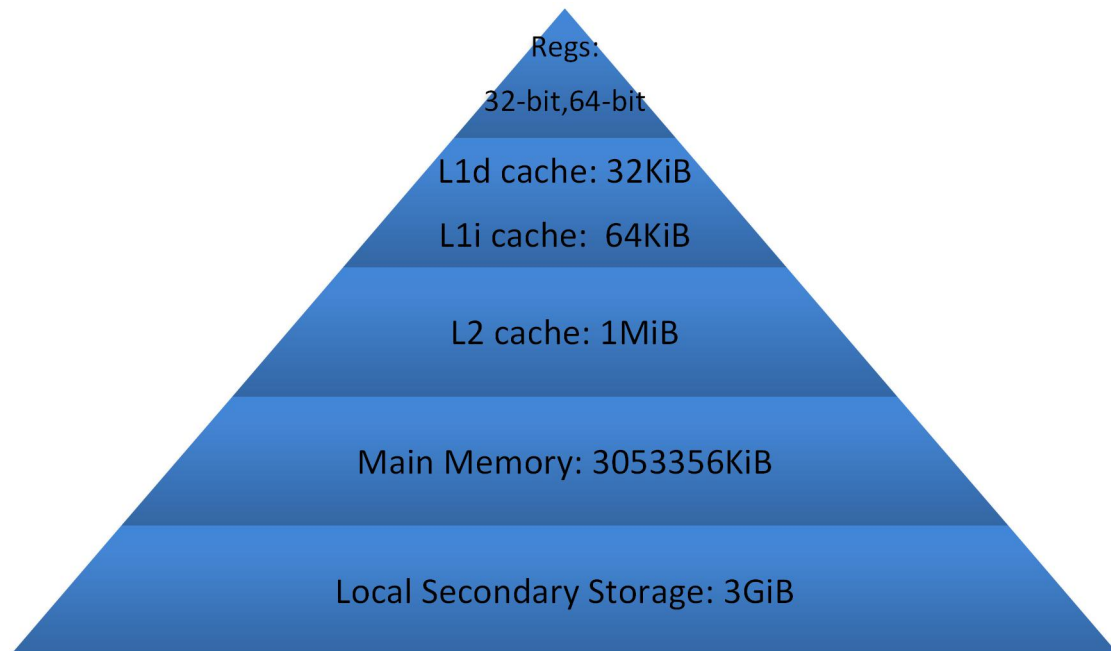
	总计	已用	空闲	共享	缓冲/缓存	可用
内存:	3053356	699952	1314160	5340	1039244	2178472
交换:	459260	0	459260			

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:



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:**

```
#!/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

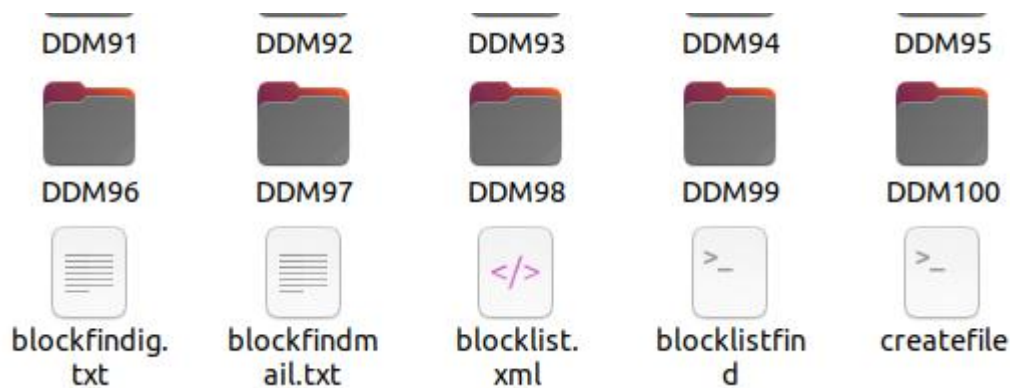


'blocklist.xml'. Changing the permission using 'chmod +x blocklistfind'. Running this bash script using: ./ blocklistfind, it will create 2 txt files containing the requested information in the current path.

#### Bash script 'blocklistfind' content:

```
#!/bin/bash
egrep "blockID=\"[0-9]{3}\" blocklist.xml > blockfindig.txt
egrep "blockID=\"[g0-9]{3}\" blocklist.xml >> blockfindig.txt
grep "@" blocklist.xml | grep "." | grep -v [-^] > blockfindmail.txt
```

#### Results:



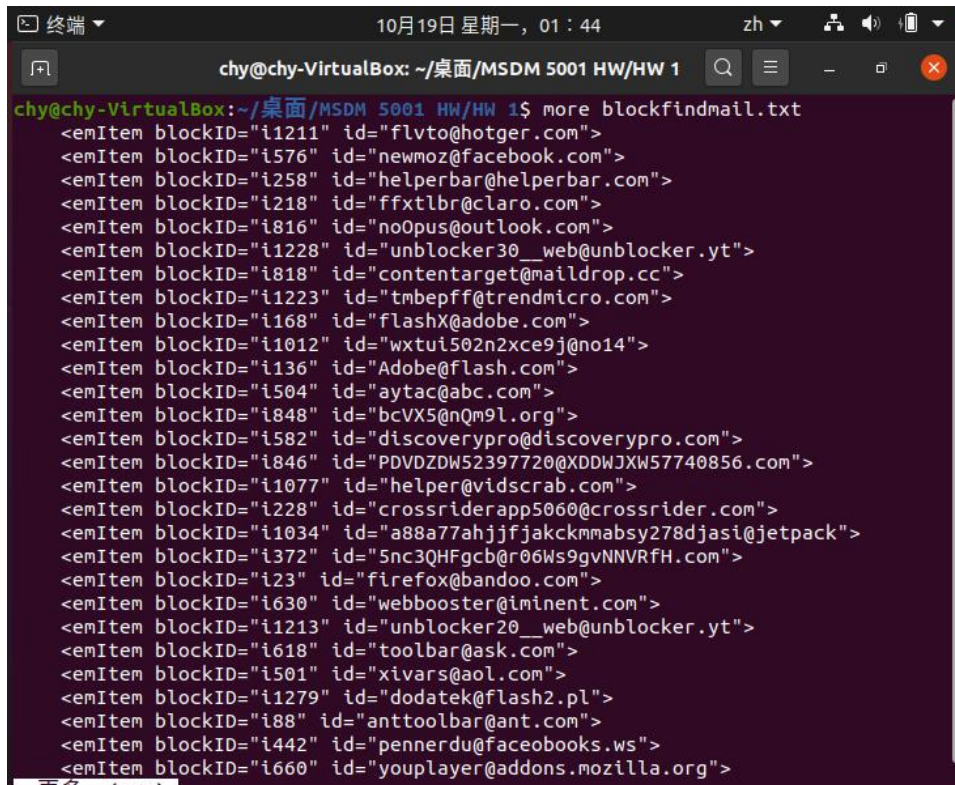
#### 1)

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.

```
终端 10月19日 星期一, 01:43 zh
chy@chy-VirtualBox: ~/桌面/MSDM 5001 HW/HW 1
pyS6XWnjDhy8@jetpack)$>
<emItem blockID="i101" id="{3a12052a-66ef-49db-8c39-e5b0bd5c83fa}">
<emItem blockID="i108" id="{28bfb930-7620-11e1-b0c4-0800200c9a66}">
<emItem blockID="i127" id="plugin@youtubeplayer.com">
<emItem blockID="i103" id="kdr-gun@gmail.com">
<emItem blockID="i104" id="yasd@youasdr3.com">
<emItem blockID="i109" id="{392e123b-b691-4a5e-b52f-c4c1027e749c}">
<emItem blockID="i105" id="{95ff02bc-ffc6-45f0-a5c8-619b8226a9de}">
<emItem blockID="i1233" id="cloudmask@cloudmask.com">
<emItem blockID="i1424" id="/^(jid0-S9kkzfTvEmC985BVmf8Z0zA5nLM@jetpack|jid
1-qps14pkDB6UDvA@jetpack|jid1-Tsr09YnAQIWL0Q@jetpack|shole@ats.ext|{38a64ef0-71
81-11e3-981f-0800200c9a66}|eochoa@ualberta.ca)$/">
<emItem blockID="i1492" id="googlotim@gmail.com">
<emItem blockID="i1493" id="{de71f09a-3342-48c5-95c1-4b0f17567554}">
<emItem blockID="i1522" id="/^(ciscowebexstart1@cisco\.com|ciscowebexstart_
test@cisco\.com|ciscowebexstart@cisco\.com|ciscowebexgpc@cisco\.com)$/">
<emItem blockID="i1523" id="{a0d7ccb3-214d-498b-b4aa-0e8fda9a7bf7}">
<emItem blockID="i1524" id="ext@alibonus.com">
<gfxBlacklistEntry blockID="g194">
<gfxBlacklistEntry blockID="g1072">
<gfxBlacklistEntry blockID="g278">
<gfxBlacklistEntry blockID="g204">
<gfxBlacklistEntry blockID="g1220">
<gfxBlacklistEntry blockID="g232">
<gfxBlacklistEntry blockID="g992">
<gfxBlacklistEntry blockID="g146">
<gfxBlacklistEntry blockID="g1219">
<gfxBlacklistEntry blockID="g1068">
<gfxBlacklistEntry blockID="g206">
```

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.

A screenshot of a terminal window titled 'chy@chy-VirtualBox: ~/桌面/MSDM 5001 HW/HW 1'. The terminal shows the command 'more blockfindmail.txt' and its output, which is a list of XML-like entries. Each entry has a 'blockID' and an 'id' field containing an email address. The entries are displayed one by one as the 'more' command scrolls through the file. The terminal window has a dark background and standard Ubuntu window controls at the top.

```
chy@chy-VirtualBox: ~/桌面/MSDM 5001 HW/HW 1$ more blockfindmail.txt
<emItem blockID="i1211" id="flvto@hotmail.com">
<emItem blockID="i576" id="newmoz@facebook.com">
<emItem blockID="i258" id="helperbar@helperbar.com">
<emItem blockID="i218" id="ffxtlbr@claro.com">
<emItem blockID="i816" id="noOpus@outlook.com">
<emItem blockID="i1228" id="unblocker30__web@unblocker.yt">
<emItem blockID="i818" id="contenttarget@maildrop.cc">
<emItem blockID="i1223" id="tmbepff@trendmicro.com">
<emItem blockID="i168" id="flashX@adobe.com">
<emItem blockID="i1012" id="wxtui502n2xce9j@no14">
<emItem blockID="i136" id="Adobe@flash.com">
<emItem blockID="i504" id="aytac@abc.com">
<emItem blockID="i848" id="bcvX5@nQm9l.org">
<emItem blockID="i582" id="discoverypro@discoverypro.com">
<emItem blockID="i846" id="PDVDZDW52397720@XDDWJXW57740856.com">
<emItem blockID="i1077" id="helper@vidscrab.com">
<emItem blockID="i228" id="crossriderapp5060@crossrider.com">
<emItem blockID="i1034" id="a88a77ahjjfjakckmmabsy278djasi@jetpack">
<emItem blockID="i372" id="5nc3QHFgcb@r06Ws9gvNNVRfH.com">
<emItem blockID="i23" id="firefox@bandoo.com">
<emItem blockID="i630" id="webbooster@iminent.com">
<emItem blockID="i1213" id="unblocker20__web@unblocker.yt">
<emItem blockID="i618" id="toolbar@ask.com">
<emItem blockID="i501" id="xivars@aol.com">
<emItem blockID="i1279" id="dodatek@flash2.pl">
<emItem blockID="i88" id="anttoolbar@ant.com">
<emItem blockID="i442" id="pennerdu@faceobooks.ws">
<emItem blockID="i660" id="youplayer@addons.mozilla.org">
```