

MSDM5001: homework1

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System(Ali Server): CentOS Linux release 7.8.2003 (Core)

Python version: Python 2.7.5

Bash version: GNU bash, 版本 4.2.46(2)-release (x86_64-redhat-linux-gnu)

Github: <https://github.com>Hello-Sarah/MSDM5001.git>

1. Linux operating system and memory hierarchy

1. Top

```
top - 10:07:00 up 40 days, 12:39, 1 user, load average: 0.00, 0.01, 0.05
Tasks: 100 total, 1 running, 99 sleeping, 0 stopped, 0 zombie
%Cpu(s): 1.0 us, 0.3 sy, 0.0 ni, 98.7 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 1882024 total, 91348 free, 1039992 used, 750684 buff/cache
KiB Swap: 0 total, 0 free, 0 used. 610008 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
17991	root	10	-10	141624	18812	6556	S	1.0	1.0	265:01.71	AliYunDun
1180	root	20	0	122192	1288	680	S	0.3	0.1	39:21.70	wrapper
1248	root	20	0	2074724	69580	3364	S	0.3	3.7	275:33.87	java
16526	srh	20	0	161996	2192	1560	R	0.3	0.1	0:00.04	top
1	root	20	0	125748	3840	2232	S	0.0	0.2	1:54.74	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
4	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kworker/0:0H
6	root	20	0	0	0	0	S	0.0	0.0	0:55.35	ksoftirqd/0
7	root	rt	0	0	0	0	S	0.0	0.0	0:00.00	migration/0
8	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_bh
9	root	20	0	0	0	0	S	0.0	0.0	4:28.83	rcu_sched
10	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	lru-add-dra+
11	root	rt	0	0	0	0	S	0.0	0.0	0:14.07	watchdog/0
13	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kdevtmpfs
14	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	netns
15	root	20	0	0	0	0	S	0.0	0.0	0:01.40	khungtaskd
16	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	writeback

2. Hardware Information

```
lscpu # check for the cpu including the caches informaiton
free -h # free -m works as well, check for the main memory informaiton
df -h # check for the disk informaiton
```

The results is showing as following:

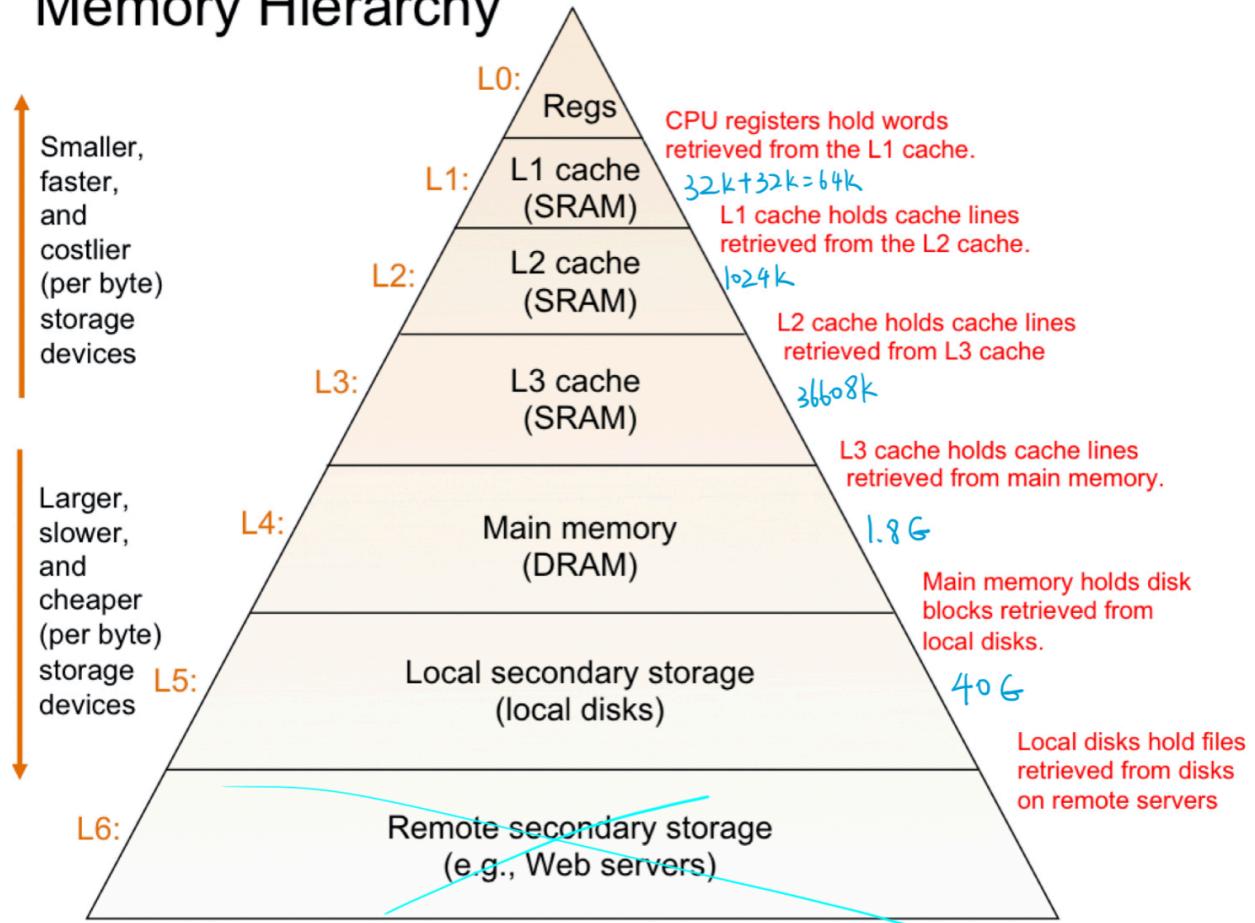
```
[srh@izuka1t9qfkgyz /]$ lscpu
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:             Little Endian
CPU(s):                1
On-line CPU(s) list:  0
Thread(s) per core:   1
Core(s) per socket:   1
Socket(s):             1
NUMA 节点:              1
厂商 ID:               GenuineIntel
CPU 系列:              6
型号:                 85
型号名称:             Intel(R) Xeon(R) Platinum 8269CY CPU @ 2.50GHz
步进:                  7
CPU MHz:               2580.000
BogoMIPS:              5000.00
我管理器厂商:          KVM
虚拟化类型:            完全
L1d 缓存:              32K
L1i 缓存:              32K
L2 缓存:              1024K
L3 缓存:              36688K
NUMA 节点0 CPU:        0
Flags:    fpu vme de pse tsc msr pae mca cx8 apic sep mtrr pge mce cmov pat pse36 clflush mmx fxsr sse sse2 ss ht syscall nx pdpe1gb rdtscp lm constant_tsc rep_good nopl eagerfpu pni pclmulqdq osxsave ssse3 fma cx16 cpuid seed1 sse4_2 x2apic movebe popcnt tsc_deadline_timer aes xsave avx f16c rdrand hypervisor lahf_lm abm 3dnnowprefetch invpcid_single ibrs ibpb stibp fsgsbase tsc_adjust bmii hle avx2 sse4_1 sse4_2 xsaveopt xsavec xgetbv1 arat spec_ctrl intel_stibp
```

```
[srh@izuka1t9qfkgyz /]$ free -h
total        used        free      shared  buff/cache   available
Mem:       1.8G       1.0G       90M       64M       729M       593M
Swap:      0B         0B         0B
```

```
[srh@izuka1t9qfkgyz /]$ df -h
文件系统      容量  已用  可用  已用% 挂载点
devtmpfs       909M    0  909M    0% /dev
tmpfs          919M    0  919M    0% /dev/shm
tmpfs          919M   65M  855M    8% /run
tmpfs          919M    0  919M    0% /sys/fs/cgroup
/dev/vda1       40G   9.2G   29G   25% /
tmpfs          184M    0  184M    0% /run/user/996
tmpfs          184M   12K  184M    1% /run/user/0
tmpfs          184M    0  184M    0% /run/user/1007
tmpfs          184M    0  184M    0% /run/user/1006
```

Based on the previous result, the memory hierarchy diagram of this server is drawn as following with blue pen showing the detail information:

Memory Hierarchy



3. Tree

```
cd/; #enter the root directory
tree | head -n 15 # show the first 15 lines content of current directory in
a tree-like format,
```

The results is showing as following:

```
[srh@izuka1t9qfkgyz /]$ cd /; tree | head -n 15
.
├── bin -> usr/bin
└── boot
    ├── config-3.10.0-1127.18.2.el7.x86_64
    ├── config-3.10.0-1127.19.1.el7.x86_64
    ├── config-3.10.0-514.26.2.el7.x86_64
    ├── config-3.10.0-514.el7.x86_64
    └── efi
        └── EFI
            └── centos [error opening dir]
└── extlinux
    ├── cat.c32
    ├── chain.c32
    ├── cmd.c32
    └── config.c32
[srh@izuka1t9qfkgyz /]$
```

2. Bash script

The bash script is written as following:



```
for i in $(seq 100); do
    name_folders=$(printf "DDM%d" $i)
    name=$(printf "time_till_now" $i)
    mkdir $name_folders
    cd $name_folders
    touch ${name}.txt
    echo -e 'nanoseconds since 1970-01-01 00:00:00 UTC:<`date "+%s%N"'">' > ${name}.txt
    cd ..
done
```

"test_2.sh" 11L, 257C

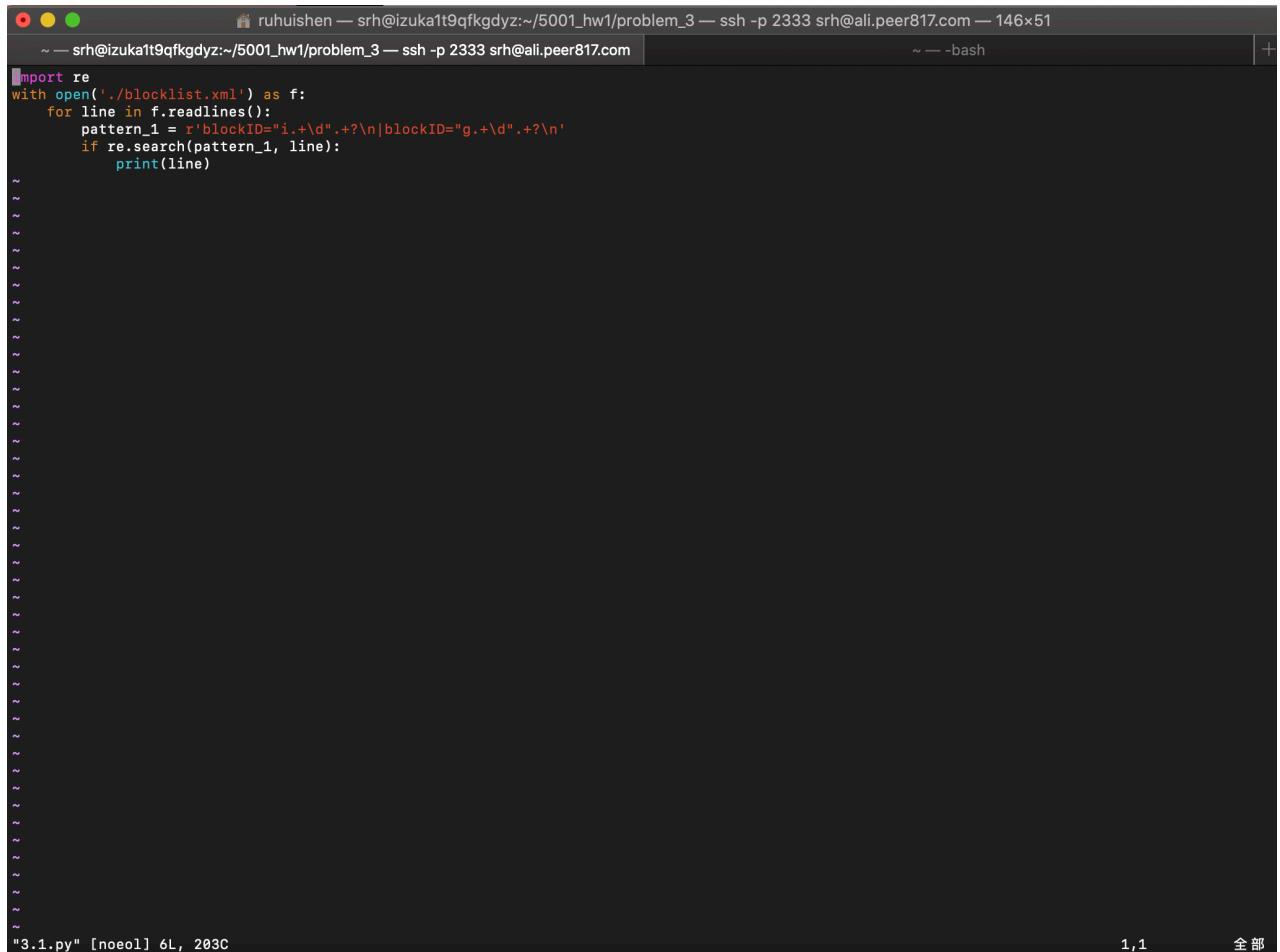
And run it to get the following result:

```
[srh@izuka1t9qfkgyz 5001_hw1]$ sh test_2.sh
[srh@izuka1t9qfkgyz 5001_hw1]$ ls
DDM1  DDM14  DDM2  DDM25  DDM30  DDM36  DDM41  DDM47  DDM52  DDM58  DDM63  DDM69  DDM74  DDM8  DDM85  DDM90  DDM96
DDM10  DDM15  DDM20  DDM26  DDM31  DDM37  DDM42  DDM48  DDM53  DDM59  DDM64  DDM7  DDM75  DDM80  DDM86  DDM91  DDM97
DDM100  DDM16  DDM21  DDM27  DDM32  DDM38  DDM43  DDM49  DDM54  DDM6  DDM65  DDM70  DDM76  DDM81  DDM87  DDM92  DDM98
DDM11  DDM17  DDM22  DDM28  DDM33  DDM39  DDM44  DDM5  DDM55  DDM60  DDM66  DDM71  DDM77  DDM82  DDM88  DDM93  DDM99
DDM12  DDM18  DDM23  DDM29  DDM34  DDM4  DDM45  DDM50  DDM56  DDM61  DDM67  DDM72  DDM78  DDM83  DDM89  DDM94  test_2.sh
DDM13  DDM19  DDM24  DDM3  DDM35  DDM40  DDM46  DDM51  DDM57  DDM62  DDM68  DDM73  DDM79  DDM84  DDM9  DDM95
[srh@izuka1t9qfkgyz 5001_hw1]$ cd DDM1
[srh@izuka1t9qfkgyz DDM1]$ ls
time_till_now.txt
[srh@izuka1t9qfkgyz DDM1]$ cat time_till_now.txt
nanoseconds since 1970-01-01 00:00:00 UTC:
<1603094850050908683>
[srh@izuka1t9qfkgyz DDM1]$
```

3. Regular expression

1. "blockID" values start with "i" or "g"

According to the problem, the script is written like this:



A screenshot of a terminal window titled 'ruhuishen — srh@izuka1t9qfkgdz:~/5001_hw1/problem_3 — ssh -p 2333 srh@ali.peer817.com — 146x51'. The terminal shows a Python script named '3.1.py' with the following code:

```
import re
with open('../blocklist.xml') as f:
    for line in f.readlines():
        pattern_1 = r'blockID="i.\+\d".+?\n|blockID="g.\+\d".+?\n'
        if re.search(pattern_1, line):
            print(line)
```

The terminal window has a dark background and light-colored text. The code is displayed in a monospaced font. The status bar at the bottom right shows '1,1' and '全部'.

And the result is like this:

```
[[srh@izuka1t9qfkgyz problem_3]$ ls
3.1.py 3.2.py  blocklist.xml
[[srh@izuka1t9qfkgyz problem_3]$ python 3.1.py
<emItem blockID="i334" id="{0F827075-B026-42F3-885D-98981EE7B1AE}">
<emItem blockID="i1211" id="f1vto@hotger.com">
<emItem blockID="i576" id="newmoz@facebook.com">
<emItem blockID="i326" id="/^(support2_en@adobe14\.com)|(XN4Xgjw7n40yUWgc\.com)|(C7yFVpIP@Weols3acxgS\.com)|(Kbeu4h0z@yNb7QAz7jrYKiiTQ3\.com)|(aWQzX@a6z4gWdPu8FF\.com)|(CBSoqAJLyPcbjTP90@JoV0VMwCjsm75Y0toAd\.com)|(zZ2jWZ1H22Jb5NdELHS@o0jQVWZkY1gx1\.com)$/">
<emItem blockID="i258" id="helperbar@helperbar.com">
<emItem blockID="i692" id="/^(j003-lqgrmpcekslhg|SupraSavings|j003-dkqonnnthqjnq|j003-kaggrpmirxjpzh)@jetpack$/">
<emItem blockID="i1229" id="/^(.*@unblocker.yt|sparpilot.com)|(axtaraxtarax.com)$/">
<emItem blockID="i218" id="ffxtlbr@claro.com">
<emItem blockID="i1137" id="/^{d50bfa5f-291d-48a8-909c-5f1a77b31948}|{d54bc985-6e7b-46cd-ad72-a4a266ad879e}|{d89e5de3-5543-4363-b320-a98cf150f86a}|{f3465017-6f51-4980-84a5-7bee2f961eba}|{fae25f38-ff55-46ea-888f-03b49aaaf8812}$/">
<emItem blockID="i515" id="/^{bf9194c2-b86d-4ebc-b953-1c08b6ff779e}|{61a83e16-7198-49c6-8874-3e4e8faeb4f3}|{f0af464e-5167-45cf-9cf0-66b396d1918c}|{5d9968c3-101c-4944-ba71-72d77393322d}|{01e86e69-a2f8-48a0-b068-83869bdb3d0}$/">
<emItem blockID="i722" id="9802047e-5a84-4da3-b103-c55995d147d1">
<emItem blockID="i433" id="c95a4e8e-816d-4655-8c79-d736da1adb6d">
<emItem blockID="i816" id="noOpus@outlook.com">
<emItem blockID="i1228" id="unblocker30_web@unblocker.yt">
<emItem blockID="i818" id="contenttarget@maildrop.cc">
<emItem blockID="i590" id="94cd2cc3-083f-49ba-a218-4cda4b4829fd">
<emItem blockID="i746" id="58d2a791-6199-482f-a9aa-9b725ec61362">
<emItem blockID="i238" id="/^pink@.*.info$/">
<emItem blockID="i1414" id="/^new@kuot.pro|{13ec6687-0b15-4f01-a5a0-7a891c18e4ee}|rebeccahopkins(ty(tr)?).com|{501815af-725e-45be-b0f2-8f36f5617afc}|{9bdb5f1f-b1e1-4a75-be31-bdcace20a99}|{e9d93e1d-792f-4f95-b738-7adb0e853b7b}|dojadewskurwa@gmail.com$/">
<emItem blockID="i690" id="55dce8ba-9dec-4013-937e-adbf9317d990">
<emItem blockID="i840" id="4889ddce-7a83-45e6-afc9-1e4f1149ffff4">
<emItem blockID="i1223" id="tmbepff@trendmicro.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="g37">

<gfxBlacklistEntry blockID="g1219">

<gfxBlacklistEntry blockID="g1068">

<gfxBlacklistEntry blockID="g206">

<gfxBlacklistEntry blockID="g1251">

<gfxBlacklistEntry blockID="g144">

<gfxBlacklistEntry blockID="g150">

<gfxBlacklistEntry blockID="g1071">

<gfxBlacklistEntry blockID="g35">

<gfxBlacklistEntry blockID="g192">

<gfxBlacklistEntry blockID="g148">

<gfxBlacklistEntry blockID="g1070">

<gfxBlacklistEntry blockID="g984">

<gfxBlacklistEntry blockID="g280">

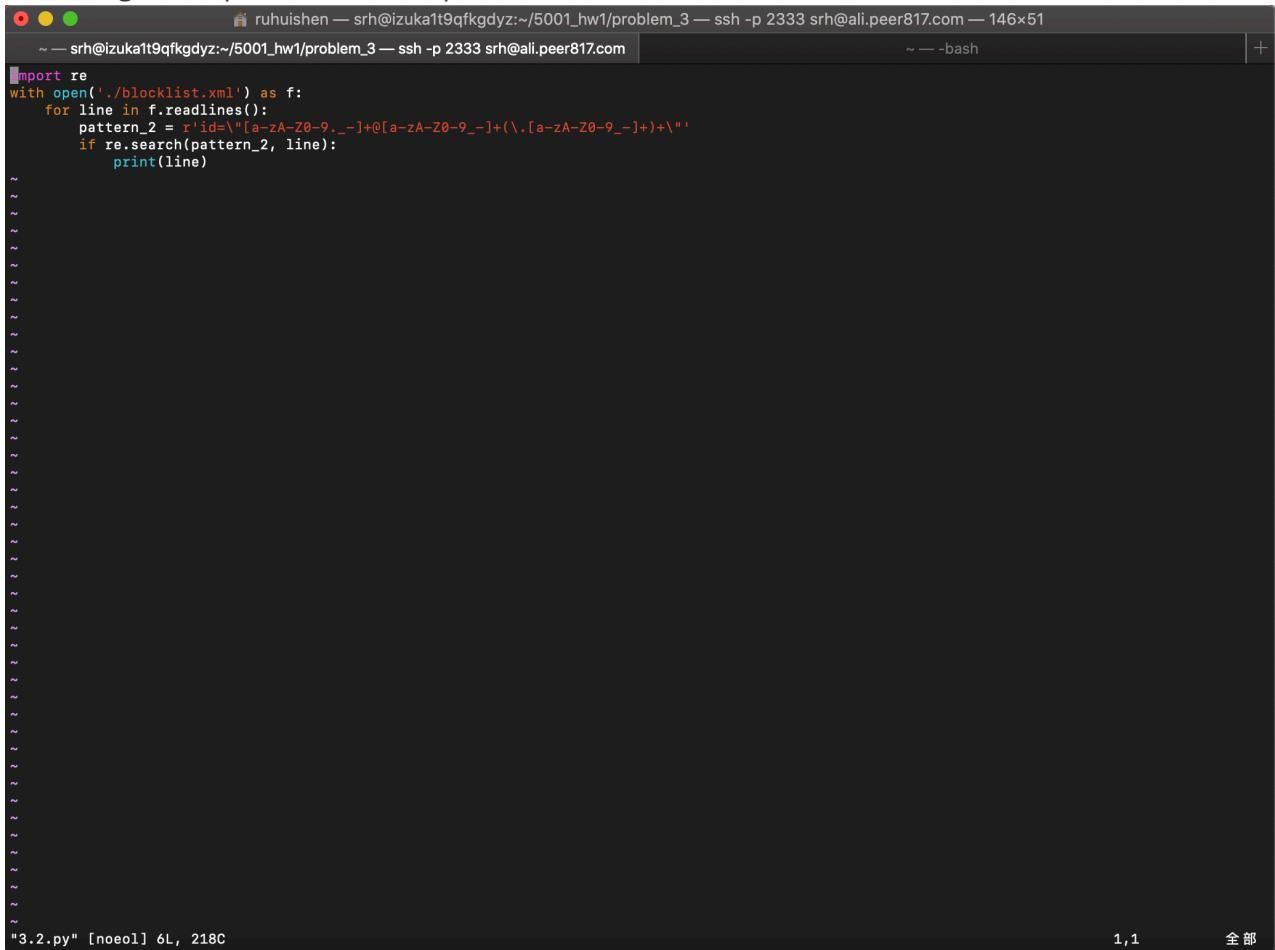
<gfxBlacklistEntry blockID="g974">

<gfxBlacklistEntry blockID="g1069">

<gfxBlacklistEntry blockID="g36">
```

2. Email

According to the problem, the script is written like this:



```
ruhuishen — srh@izuka1t9qfkgyz:~/5001_hw1/problem_3 — ssh -p 2333 srh@ali.peer817.com — 146x51
~ — -bash

import re
with open('../blocklist.xml') as f:
    for line in f.readlines():
        pattern_2 = r'id=[a-zA-Z0-9_.-]+@[a-zA-Z0-9_-]+(\.[a-zA-Z0-9_-]+)+'
        if re.search(pattern_2, line):
            print(line)

"3.2.py" [noeol] 6L, 218C
```

And the result is like this:

```
[[srh@izuka1t9qfkgyz problem_3]$ python 3.2.py
<emItem blockID="i1211" id="flvto@hotger.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="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="i372" id="5nc3QHFgcb@r06Ws9gvNNVRfH.com">
<emItem blockID="i23" id="firefox@bandoo.com">
<emItem blockID="i630" id="webbooster@imminent.com">
<emItem blockID="i1213" id="unblocker20__web@unblocker.yt">
<emItem blockID="i618" id="toolbar@ask.com">
<emItem blockID="i700" id="2bbadf1f-a5af-499f-9642-9942fcdb7c760f05a14cc-8842-4eee-be17-744677a917ed.com">
<emItem blockID="i501" id="xivars@aol.com">
<emItem blockID="i1279" id="dodatek@flash2.pl">
<emItem blockID="i88" id="anttoolbar@ant.com">
```