OS HW1 Programming projects

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分工: $\frac{1}{3}$ for each

Environment

OS: Ubuntu 22.04Kernel: 6.5.0-26-genericCompiler: gcc 12.3.9

Ch2 project 1

Commands

```
cd 2.P1
make
make install # for install module
cat /proc/jiffies
cat /proc/seconds
make remove # for remove module
make clean
```

Result image

- catjam@catjam-virtual-machine:~/OSu/hw1/2.P1\$ cat /proc/jiffies
 The current jiffies is 4306246638
 catjam@catjam-virtual-machine:~/OSu/hw1/2.P1\$ cat /proc/seconds
 Already pass 7 seconds since the module installed
 - Figure 1: The result for cat /proc/jiffies and cat /proc/jiffies

Ch3 project 1

Commands

```
gcc 3.P1/osh.c -o osh
./osh
ls -l > out.txt
sort < out.txt
cat in.txt | sort -h --parallel=4
!!
rm out.txt
exit</pre>
```

Result image

```
catjam@catjam-virtual-machine:~/OSu/hw1$ ./osh
osh> ls -l > out.txt
osh> sort < out.txt
drwxrwxr-x 2 catjam catjam
                              4096
                                        20 16:32 3.P3
drwxrwxr-x 2 catjam catjam
                              4096
                                        21 00:36 3.P2
drwxrwxr-x 2 catjam catjam
                              4096
                                        22 01:12 3.19
drwxrwxr-x 2 catjam catjam
                              4096
                                        22 01:23 3.21
drwxrwxr-x 2 catjam catjam
                              4096
                                        22 01:27 2.24
drwxrwxr-x 2 catjam catjam
                              4096
                                        22 01:55 3.P1
drwxrwxr-x 2 catjam catjam
                              4096
                                        22 02:01 3.27
drwxrwxr-x 2 catjam catjam
                              4096
                                        22 23:24 2.P1
drwxrwxr-x 4 catjam catjam
                                        21 02:03 3.P4
                              4096
-rw-r--r-- 1 catjam catjam
                                        22 23:28 out.txt
                              1001
-rw-r--r-- 1 catjam catjam 5294520
                                        17 16:20 cat.gif
-rw-rw-r-- 1 catjam catjam 1171910
                                        22 23:31 project docs.pdf
-rw-rw-r-- 1 catjam catjam 1377365
                                        22 02:07 problem docs.pdf
-rw-rw-r-- 1 catjam catjam
                                        22 02:07 problem docs.typ
                              1651
-rw-rw-r-- 1 catjam catjam
                                        19 10:05 in.txt
                                41
-rw-rw-r-- 1 catjam catjam
                               737
                                        22 23:31 project docs.typ
                                        22 23:25 osh
-rwxrwxr-x 1 catjam catjam
                             16816
total 7740
osh> cat in.txt | sort -h --parallel=4
April
2e-4
3.13
344
34213
45K
98K
12M
1G
osh>!!
April
2e-4
3.13
344
34213
45K
98K
12M
1G
osh> rm out.txt
osh> exit
```

Figure 2: The result for ls -l > out.txt, sort < out.txt, cat in.txt | sort -h -parallel=4, !!, rm out.txt, exit

Ch3 project 2

Commands

```
cd 3.P2
make
make install # install module
echo 1 > /proc/pid
cat /proc/pid
make remove # remove module
```

Result image

```
    catjam@catjam-virtual-machine:~/OSu/hw1/3.P2$ echo 1 > /proc/pid
    catjam@catjam-virtual-machine:~/OSu/hw1/3.P2$ cat /proc/pid name: systemd, pid: [1], state: S
```

Figure 3: The result for echo 1 > /proc/pid and cat /proc/pid

Ch3 project 3

Commands

```
cd 3.P3/macro
make
make install
sudo dmesg | tail
make remove
cd ../dfs
make
make install
sudo dmesg | tail
make remove
```

Result image

```
catjam@catjam-virtual-machine:~/OSu/hw1/3.P3/macro$ sudo dmesg | tail [47620.693528] name: kworker/1:0, pid: [29579], state: I [47620.693530] name: kworker/1:2, pid: [29937], state: D [47620.693533] name: kworker/0563:3, pid: [30077], state: I [47620.693536] name: kworker/1:1, pid: [30140], state: I [47620.693568] name: sleep, pid: [30254], state: S [47620.693570] name: sleep, pid: [30264], state: S [47620.693573] name: make, pid: [30641], state: S [47620.693578] name: sudo, pid: [30642], state: S [47620.693578] name: sudo, pid: [30643], state: S [47620.693578] name: sudo, pid: [30644], state: S [47620.693580] name: simod, pid: [30644], state: S
```

Figure 4: The result for sudo dmesg | tail after make install in 3.P3/macro

```
catjam@catjam-virtual-machine:-/Osu/hud/3.P3/dfs$ sudo dmesg | tail [47671.134427] name: kworker/0:2, pid: [27234], state: I [47671.134429] name: kworker/0:0H, pid: [27308], state: I [47671.134430] name: kworker/1:0, pid: [28405], state: I [47671.134431] name: kworker/1:0, pid: [29579], state: I [47671.134437] name: kworker/1:2, pid: [2937], state: I [47671.134438] name: kworker/1:2, pid: [30077], state: I [47671.134451] name: kworker/1:1, pid: [30140], state: I [47671.134451] name: kworker/0:0, pid: [30646], state: I [47671.134453] name: kworker/0:0H, pid: [30660], state: I [47671.134454] name: kworker/0:1H, pid: [30661], state: I
```

Figure 5: The result for sudo dmesg | tail after make install in 3.P3/dfs

Ch3 project 4

Commands

```
cd 3.P4/1
make
make install
sudo dmesg | tail
make remove
cd ../2
make
sudo insmod ./collatz.ko start=40
```

```
sudo dmesg | tail
sudo rmmod collatz
```

Result image

```
• catjam@catjam-virtual-machine:-/OSu/hw1/3.P4/1$ sudo dmesg | tail [47671.134447] name: kworker/1:2, pid: [29937], state: I [47671.134448] name: kworker/u256:3, pid: [30077], state: I [47671.134450] name: kworker/1:1, pid: [30040], state: I [47671.134451] name: kworker/0:0, pid: [30666], state: I [47671.134453] name: kworker/0:0, pid: [30660], state: I [47671.134453] name: kworker/0:10, pid: [30661], state: I [48186.024064] red: 138, green: 226, blue: 43 [48186.024105] red: 0, green: 123, blue: 167 [48186.024107] red: 75, green: 0, blue: 130
```

Figure 6: The result for sudo dmesg | tail after make install in 3.P4/1

```
catjam@catjam-virtual-machine:~/OSu/hw1/3.P4/2$ sudo dmesg | tail [48495.275734] collatz module removed [48501.431342] value: 40 [48501.431351] value: 20 [48501.431352] value: 10 [48501.431355] value: 5 [48501.431355] value: 16 [48501.431355] value: 8 [48501.431357] value: 4 [48501.431357] value: 2 [48501.431357] value: 1
```

Figure 7: The result for sudo dmesg | tail after sudo insmod ./collatz.ko start=40 in 3.P4/2