

SISTEM OPERASI

Praktikum 3: Operasi Input Output

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Percobaan 1: File Descriptor

```
~ 09:41:49
> ps
PID TTY          TIME CMD
 13 pts/0        00:00:00 zsh
 17 pts/0        00:00:00 zsh
 49 pts/0        00:00:00 gitstatusd-linu
142 pts/0        00:00:00 ps

~ 09:41:51
> cat
hallo, apa kabar?
hallo, apa kabar?

~ 7s 09:42:00
> mail annisa.taufika@polinema.ac.id
Cc: Lavina
Subject: Percobaan 1

Null message body; hope that's ok

~ 17s 09:42:21
> mail annisa.taufika@polinema.ac.id
Cc: Lavina
Subject: Percobaan 1
Input dari keyboard dan output ke alamat internet

~ 26s 09:42:59
> mkdir mydir
mkdir: cannot create directory 'mydir': File exists

~ 09:43:10
>
```

Percobaan 2: Pembelokan (redirection)

```
~ 11:41:38
> cat 1> myfile.txt
Ini adalah teks yang saya simpan ke file myfile.txt

~ 30s 11:43:57
> cat 0< myfile.txt
Ini adalah teks yang saya simpan ke file myfile.txt

~ 11:44:59
> cat myfile.txt
Ini adalah teks yang saya simpan ke file myfile.txt
```

```
~ 11:45:23
> mkdir mydir
mkdir: cannot create directory 'mydir': File exists

~ 11:45:30
> mkdir mydir 2> myerror.txt

~ 11:45:46
> cat myerror.txt
mkdir: cannot create directory 'mydir': File exists

~ 11:45:52
> ls filebaru
ls: cannot access 'filebaru': No such file or directory

~ 11:46:08
> ls filebaru 2> out.txt

~ 11:46:25
```

```
~ 11:46:25
> cat out.txt
ls: cannot access 'filebaru': No such file or directory

~ 11:46:31
> ls filebaru 2> out.txt 2>&1
ls: cannot access 'filebaru': No such file or directory

~ 11:46:58
> cat out.txt
ls: cannot access 'filebaru': No such file or directory

~ 11:47:09
> echo "mencoba menulis file" 1> baru

~ 11:50:27
> cat filebaru 2> baru 1>&2

~ 11:50:52
> cat baru
cat: filebaru: No such file or directory
```

```
~ 11:50:59
> echo "kata pertama" > surat

~ 11:51:31
> echo "kata kedua" >> surat

~ 11:51:44
> echo "kata ketiga" >> surat
```

```
~ 11:51:44
> echo "kata ketiga" >> surat

~ 11:51:59
> cat surat
kata pertama
kata kedua
kata ketiga

~ 11:52:04
> echo "kata keempat" > surat

~ 11:52:29
> cat surat
kata keempat

~ 11:52:31
> cat <<+
heredoc> Hallo, apa kabar?
heredoc> Baik-baik saja ?
heredoc> Ok !
heredoc> ++
Hallo, apa kabar?
Baik-baik saja ?
Ok !
```

```
~ 11:56:10
> cat <<%%%
heredoc> Hallo, apa kabar ?
heredoc> Baik-baik saja ?
heredoc> Ok !
heredoc> %%%
Hallo, apa kabar ?
Baik-baik saja ?
Ok !
```

```
~ 12:07:10
> echo hello
hello

~ 12:07:16
> echo hello > output

~ 12:07:24
> cat output
hello

~ 12:07:32
> echo bye >> output

~ 12:07:42
> cat output
hello
bye

~ 12:07:44
> cat output
hello
bye

~ 12:07:54
> cat < output
hello
bye

~ 12:08:06
> cat < output > out
```

```
~ 12:08:22
> cat out
hello
bye

~ 12:08:25
> cat < output >> out

~ 12:08:39
> cat out
hello
bye
hello
bye

~ 12:08:43
> cat < output > output

~ 12:09:04
> cat output

~ 12:09:11
> cat < out >> out
cat: -: input file is output file
```

```
~ 12:09:35
> cat out
hello
bye
hello
bye

~ 12:09:39
> _
```

Percobaan 3: Pipa (pipeline)

```
~ 12:14:42
> who

~ 12:14:52
> who | sort

~ 12:15:00
> who | sort -r

~ 12:15:07
> who > tmp

~ 12:15:16
> sort tmp

~ 12:15:24
> rm tmp

~ 12:15:29
> ls -l /etc | more
total 816
drwxr-xr-x 2 root root 4096 Nov 23 04:37 PackageKit
drwxr-xr-x 7 root root 4096 Mar  5 17:24 X11
-rw-r--r-- 1 root root 3028 Nov 23 04:36 adduser.conf
-rw-r--r-- 1 root root  51 Mar  6 13:52 aliases
-rw-r--r-- 1 root root 12288 Mar  6 13:52 aliases.db
drwxr-xr-x 2 root root 4096 Mar  6 13:52 alternatives
drwxr-xr-x 3 root root 4096 Mar  5 18:47 apache2
drwxr-xr-x 3 root root 4096 Nov 23 04:37 apparmor
drwxr-xr-x 8 root root 4096 Nov 23 04:37 apparmor.d
drwxr-xr-x 3 root root 4096 Nov 23 04:37 apport
```

```
~ 12:15:54
> ls -l /etc | sort | more
-r--r----- 1 root root    1671 Feb  8  2022 sudoers
-r--r--r-- 1 root root      0 Nov 23 04:37 machine-id
-rw-r----- 1 root shadow   685 Mar  6 13:52 gshadow-
-rw-r----- 1 root shadow   698 Mar  6 13:52 gshadow
-rw-r----- 1 root shadow   858 Mar  6 13:52 shadow
-rw-r----- 1 root shadow   858 Mar  6 13:52 shadow-
-rw-r--r-- 1 root root      0 Nov 23 04:36 subgid-
-rw-r--r-- 1 root root      0 Nov 23 04:36 subuid-
-rw-r--r-- 1 root root     13 Aug 23  2021 debian_version
-rw-r--r-- 1 root root     13 Mar  8 08:44 timezone
-rw-r--r-- 1 root root     16 Mar  8 08:44 hostname
-rw-r--r-- 1 root root     17 Mar  6 13:52 mailname
-rw-r--r-- 1 root root     19 Aug  2  2023 issue.net
-rw-r--r-- 1 root root     20 Feb 24 16:06 subgid
-rw-r--r-- 1 root root     20 Feb 24 16:06 subuid
-rw-r--r-- 1 root root     21 Feb 24 16:05 wsl.conf
-rw-r--r-- 1 root root     26 Aug  2  2023 issue
-rw-r--r-- 1 root root     34 Dec 16  2020 ld.so.conf
-rw-r--r-- 1 root root     37 Nov 23 04:36 fstab
-rw-r--r-- 1 root root     45 Nov 11  2021 bash_completion
-rw-r--r-- 1 root root     51 Mar  6 13:52 aliases
-rw-r--r-- 1 root root     91 Oct 15  2021 networks
-rw-r--r-- 1 root root     92 Oct 15  2021 host.conf
-rw-r--r-- 1 root root    104 Aug  2  2023 lsb-release
-rw-r--r-- 1 root root    106 Nov 23 04:36 environment
-rw-r--r-- 1 root root    111 Sep 12 00:59 magic
-rw-r--r-- 1 root root    111 Sep 12 00:59 magic.mime
-rw-r--r-- 1 root root    180 Mar  5 17:26 shells
```

Percobaan 4: Filter

```
~ 12:18:41
> w -h | grep '<lavina>'

~ 12:19:25
> grep '<lavina>' /etc/passwd

~ 12:19:48
> ls /etc | wc
170      170      1610
```

```
~ x + v - □ x
> ls /etc | wc -l
170

~ 12:20:42
> cat > kelas1.txt
Budi
Gama
Asep
Muchlis

~ 16s 12:21:08
> cat kelas1.txt kelas2.txt | sort
cat: kelas2.txt: No such file or directory
Asep
Budi
Gama
Muchlis

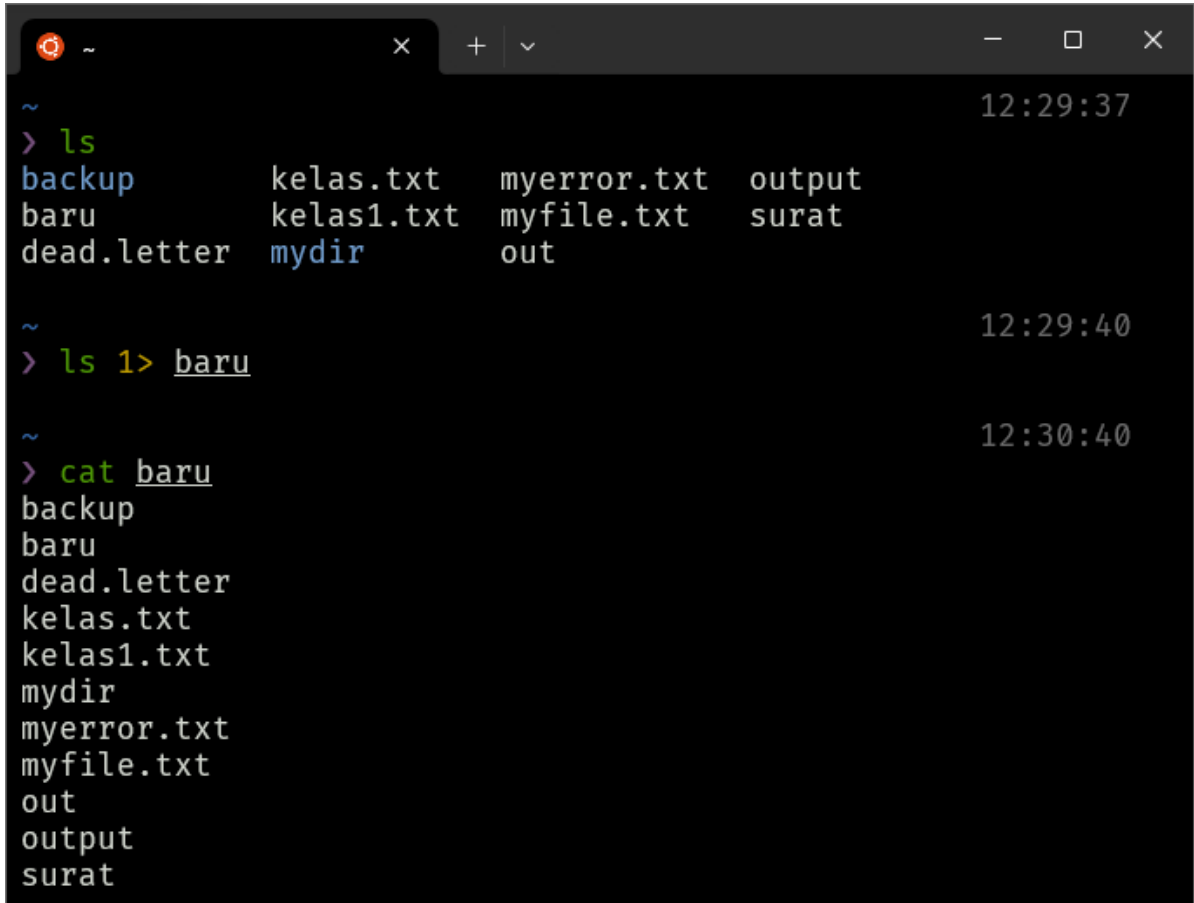
~ 12:21:24
> cat kelas1.txt kelas2.txt > kelas.txt
cat: kelas2.txt: No such file or directory

~ 12:21:46
> cat kelas.txt | sort | uniq
Asep
Budi
Gama
Muchlis

~ 12:21:59
> _
```


LATIHAN:

1. Lihat daftar secara lengkap pada direktori aktif, belokkan tampilan standard output ke file baru.

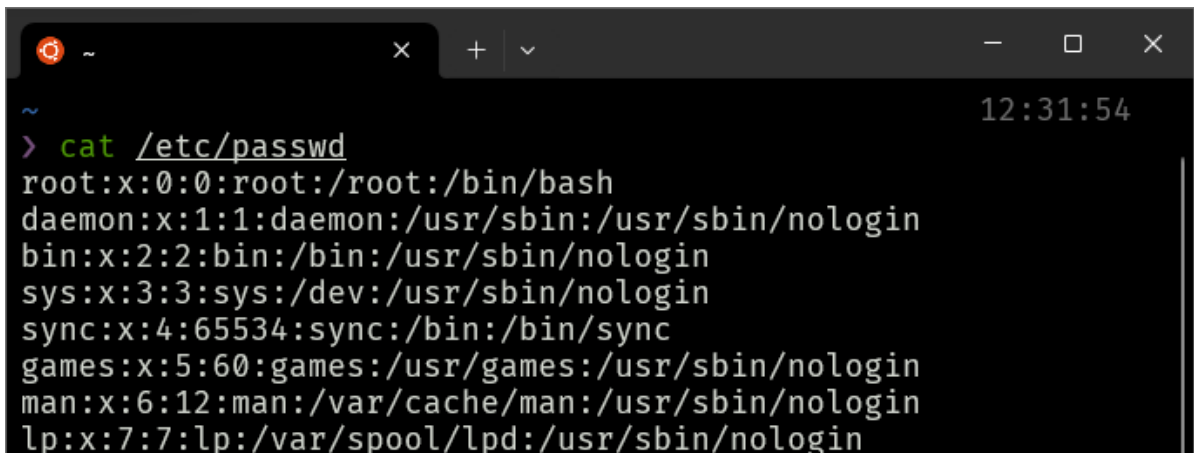


```
~ 12:29:37
> ls
backup      kelas.txt  myerror.txt output
baru        kelas1.txt myfile.txt  surat
dead.letter mydir      out

~ 12:29:40
> ls 1> baru

~ 12:30:40
> cat baru
backup
baru
dead.letter
kelas.txt
kelas1.txt
mydir
myerror.txt
myfile.txt
out
output
surat
```

2. Lihat daftar secara lengkap pada direktori /etc/passwd, belokkan tampilan standard output ke file baru tanpa menghapus file baru sebelumnya.



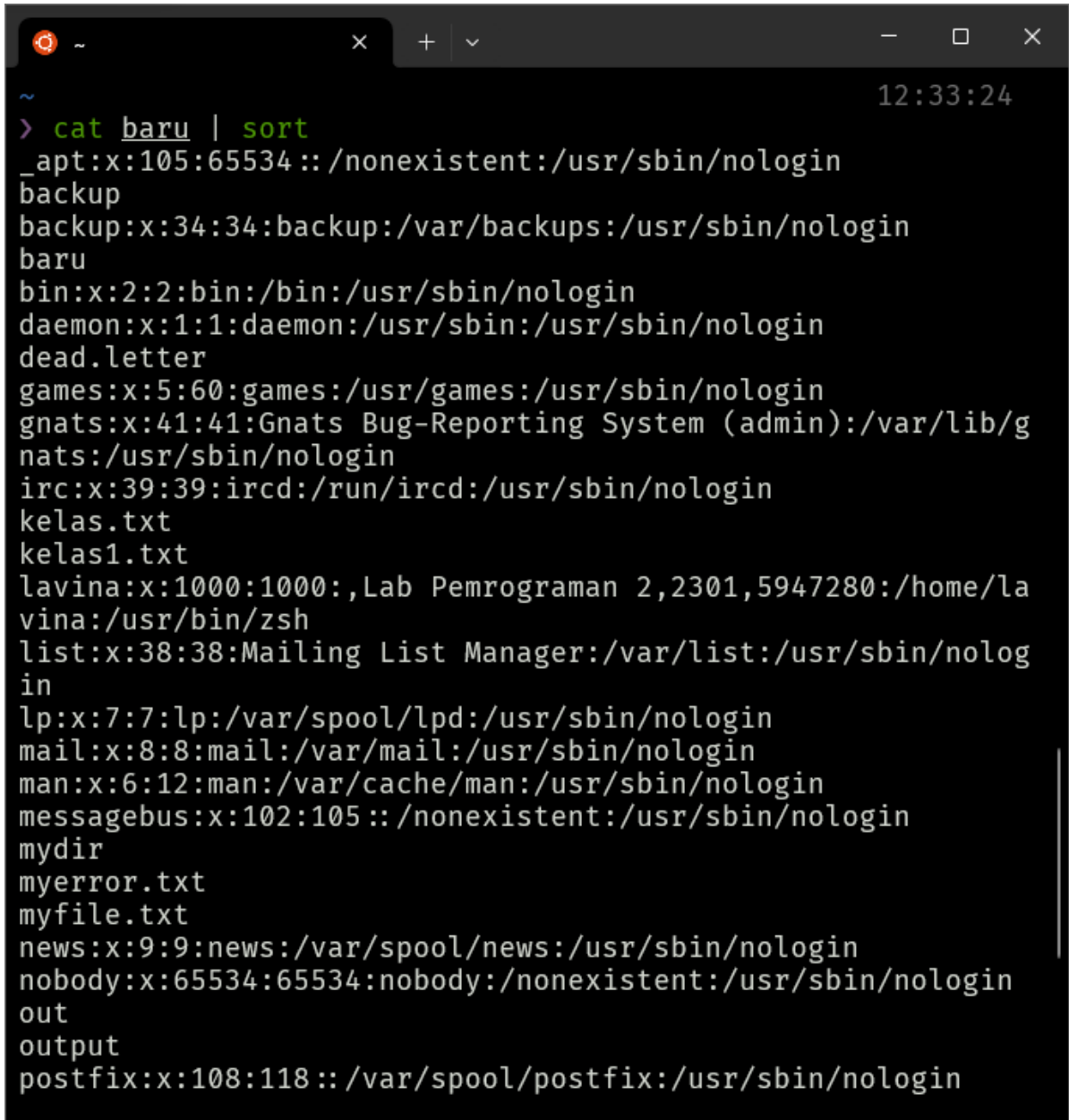
```
~ 12:31:54
> cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
```

```
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
```

```
~ 12:32:24
> cat /etc/passwd 1>> baru

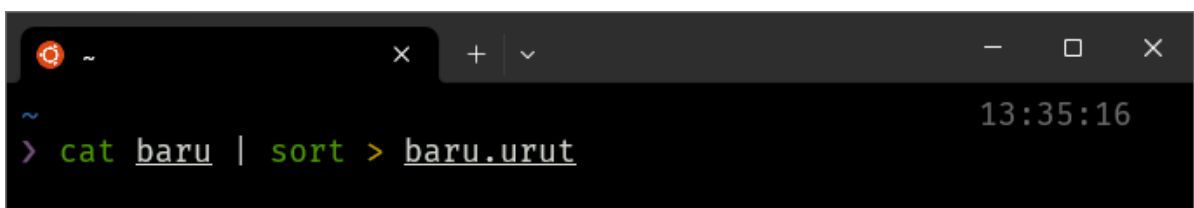
~ 12:33:20
> cat baru
backup
baru
dead.letter
kelas.txt
kelas1.txt
mydir
myerror.txt
myfile.txt
out
output
surat
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
```

3. Urutkan file baru dengan cara membelokkan standard input.



```
~ 12:33:24
> cat baru | sort
_apt:x:105:65534::/nonexistent:/usr/sbin/nologin
backup
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
baru
bin:x:2:2:bin:/bin:/usr/sbin/nologin
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
dead.letter
games:x:5:60:games:/usr/games:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/g
nats:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
kelas.txt
kelas1.txt
lavina:x:1000:1000:.,Lab Pemrograman 2,2301,5947280:/home/la
vina:/usr/bin/zsh
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nolog
in
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
messagebus:x:102:105::/nonexistent:/usr/sbin/nologin
mydir
myerror.txt
myfile.txt
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
out
output
postfix:x:108:118:./var/spool/postfix:/usr/sbin/nologin
```

4. Urutkan file baru dengan cara membelokkan standard input dan standard output ke file baru.urut.



```
~ 13:35:16
> cat baru | sort > baru.urut
```

```

~ 13:35:48
> cat baru.urut
_apt:x:105:65534::/nonexistent:/usr/sbin/nologin
backup
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
baru
bin:x:2:2:bin:/bin:/usr/sbin/nologin
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
dead.letter
games:x:5:60:games:/usr/games:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/g
nats:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
kelas.txt
kelas1.txt
lavina:x:1000:1000:,,Lab Pemrograman 2,2301,5947280:/home/la
vina:/usr/bin/zsh
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nolog
in
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
messagebus:x:102:105::/nonexistent:/usr/sbin/nologin
mydir
myerror.txt
myfile.txt
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin

```

5. Buatlah direktori latihan2 sebanyak 2 kali dan belokkan standard error ke file rmdirerror.txt.

```

~ 13:35:53
> mkdir latihan2

~ 13:37:47
> mkdir latihan2
mkdir: cannot create directory 'latihan2': File exists

~ 13:37:49
> mkdir latihan2 2> rmdirerror.txt

~ 13:38:29
> cat rmdirerror.txt
mkdir: cannot create directory 'latihan2': File exists

```

6. Urutkan kalimat berikut :

Jakarta

Bandung

Surabaya

Padang

Palembang

Lampung

Dengan menggunakan notasi here document (<@@@ ...@@@)

```
~ 13:40:39
> sort <<@@@
heredoc> Jakarta
heredoc> Bandung
heredoc> Surabaya
heredoc> Padang
heredoc> Palembang
heredoc> Lampung
heredoc> @@@
Bandung
Jakarta
Lampung
Padang
Palembang
Surabaya
```

7. Hitung jumlah baris, kata dan karakter dari file baru.urut dengan menggunakan filter dan tambahkan data tersebut ke file baru.

```
~ 13:46:12
> ls baru.urut | wc > baru

~ 13:46:42
> cat baru
      1      1     10
```

8. Gunakan perintah di bawah ini dan perhatikan hasilnya.

\$ cat > hello.txt

dog cat

cat duck

dog chicken

chicken duck

chicken cat

dog duck

[Ctrl-d]

\$ cat hello.txt | sort | uniq

\$ cat hello.txt | grep "dog" | grep -v "cat"

```
~ 13:46:46
> cat > hello.txt
dog cat
cat duck

dog chicken
chicken duck
chicken cat
dog duck

~ 33s 13:49:03
> cat hello.txt | sort | uniq

cat duck
chicken cat
chicken duck
dog cat
dog chicken
dog duck

~ 13:49:16
> cat hello.txt | grep "dog" | grep -v "cat"
dog chicken
dog duck
```