

Unix environment

Sritrusta Sukaridhoto, ST. Ph.D

Login

```
hpc1 [Running]
Debian GNU/Linux 8 hpc1 tty1
hpc1 login: _
```

```
Debian GNU/Linux 8 hpc1 tty1
hpc1 login: root
Password:
Last login: Tue Oct  6 12:22:58 WIB 2015 on tty1
Linux hpc1 3.16.0-4-686-pae #1 SMP Debian 3.16.7-ckt
The programs included with the Debian GNU/Linux system
the exact distribution terms for each program are de
individual files in /usr/share/doc/*/copyright.
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY,
permitted by applicable law.
root@hpc1:~# _
```

```
Debian GNU/Linux 8 hpc1 tty1
hpc1 login: dphoto
Password:
Last login: Tue Sep  8 15:09:21 WIB 2015 on tty1
Linux hpc1 3.16.0-4-686-pae #1 SMP Debian 3.16.7-ckt
The programs included with the Debian GNU/Linux system
the exact distribution terms for each program are des
individual files in /usr/share/doc/*/copyright.
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY,
permitted by applicable law.
dphoto@hpc1:~$ _
```

- Linux environment
- Login
 - Admin – root
 - User – abcdef
- Admin login ditandai dengan #, user \$
- User → Admin
 - \$ su
- Admin → User
 - # exit

TAB key

```
iseng4h-macbookpro:~ dhoto$ if
```

TAB 1x

```
iseng4h-macbookpro:~ dhoto$ if  
if      ifconfig  ifnames  ifnames213
```

TAB 2x

```
iseng4h-macbookpro:~ dhoto$ ifc
```

Ketik "ifc" lalu tab

```
iseng4h-macbookpro:~ dhoto$ ifconfig
```

Argument

Main program :
ls

Argumen: -l

```
iseng4h-macbookpro:~ dhoto$ ls -l
total 328
drwx-----  5 dhoto  staff   170 May  5 22:40 Applications
drwx-----@  4 dhoto  staff   136 Sep 29 2014 Creative Cloud Files
drwx-----+ 23 dhoto  staff   782 Oct  6 12:31 Desktop
drwx-----+ 40 dhoto  staff  1360 Oct  6 10:33 Documents
drwx-----+ 852 dhoto  staff 28968 Oct  6 12:19 Downloads
drwx-----@ 27 dhoto  staff   918 Oct  5 01:18 Music
drwx-----@ 18 dhoto  staff   612 Sep 28 08:54 Pictures
drwx-----@ 60 dhoto  staff  2040 Sep 10 16:28 Public
drwx-----+ 11 dhoto  staff   374 Jun 11 16:04 Recent
drwx-----+  6 dhoto  staff   204 Jun 11 15:44 Sites
drwx-----+ 61 dhoto  staff  2074 Sep 10 15:01 System
drwxr-xr-x  19 dhoto  staff   646 Sep  1 13:15 System
drwxr-xr-x+ 14 dhoto  staff   476 Apr  3 2014 Public
drwxr-xr-x   6 dhoto  staff   204 Sep  8 15:03 VirtualBox VMs
-rw-r--r--   1 dhoto  staff 53248 Jun 25 16:48 data.txt
-rw-r--r--   1 dhoto  staff 51936 Apr 12 00:34 hs_err_pid59613.log
-rw-r--r--   1 dhoto  staff 45980 Apr 20 23:38 hs_err_pid8815.log
```

Gunakan -help
untuk argumen
lainnya

Bekerja dengan file dan direktori

```
iseng4h-macbookpro:~ dhoto$ cd /Users/  
iseng4h-macbookpro:Users dhoto$ ls  
Guest Shared dhoto vrlab  
iseng4h-macbookpro:Users dhoto$
```

Perintah untuk direktori:

- cd
- mkdir <direktori>
- Rmdir <direktori>

Perintah yang berhubungan dengan file:

- Melihat list file pada suatu direktori, ls
- Membuat file baru, touch <file>
- Melihat isi suatu file, cat [file]
- Menghapus suatu file, rm [file]

Coba gambarkan struktur file untuk direktori / dan /var !!!

Permission

Direktori : drwxr-xr-x

Pemilik : dhoto
Grup : staff

```
iseng4h-macbookpro:~ dhoto$ ls -ld ../dhoto/  
drwxr-xr-x+ 51 dhoto  staff  1734 Sep 22 13:26 ../dhoto/  
iseng4h-macbookpro:~ dhoto$ ls -l ../dhoto/.profile  
-rw-r--r--  1 dhoto  staff  240 Jan 17  2015 ../dhoto/.profile
```

File : -rw-r--r--

```
iseng4h-macbookpro:~ dhoto$ ls -l coba.sh  
-rw-r--r--  1 dhoto  staff  31 Oct  6 13:10 coba.sh  
iseng4h-macbookpro:~ dhoto$ chmod 754 coba.sh  
iseng4h-macbookpro:~ dhoto$ ls -l coba.sh  
-rwxr-xr--  1 dhoto  staff  31 Oct  6 13:10 coba.sh  
iseng4h-macbookpro:~ dhoto$
```

Arti rwx:

- Huruf r, file tersebut bisa di baca
- Huruf w, file tersebut bisa di tulis
- Huruf x, file tersebut bisa di eksekusi

4 2 1	4 2 1	4 2 1
r w x	r w x	r w x
User	Group	Other

Proses

PID

```
seng4h-macbookpro:~ dhoto$ ps ax
  PID  TT  STAT      TIME COMMAND
    1  ??  Ss      12:20.29 /sbin/launchd
   42  ??  Ss       2:03.49 /usr/sbin/syslogd
   43  ??  Ss       2:26.54 /usr/libexec/UserEventAgent
   45  ??  Ss       0:10.57 /usr/libexec/kextd
   46  ??  Ss       3:41.40 /System/Library/Frameworks/IOKit.framework/Ve
   48  ??  Ss       0:00.17 /usr/libexec/thermald
   50  ??  Us       0:01.68 /System/Library/CoreServices/appleeventsd --server
   51  ??  Ss       1:54.48 /usr/libexec/configd
   52  ??  Ss       0:37.83 /System/Library/CoreServices/powerd.bundle/powerd
   56  ??  Ss       4:02.23 /usr/libexec/airportd
   58  ??  SNs      0:01.01 /usr/libexec/warmd
   59  ??  Ss      10:55.74 /System/Library/Frameworks/CoreServices.framework/Fr
```

Task manager di windows

kill -9 <PID>

Script and Program

Contoh script

```
iseng4h-macbookpro:~ dhoto$ cat coba.sh
#!/bin/bash
```

```
echo "Coba Program"
```

Contoh program

```
iseng4h-macbookpro:~ dhoto$ cat coba.c
```

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
int main() {
```

```
    printf("Coba Program\n");
```

```
    return 0;
```

```
}
```

```
iseng4h-macbookpro:~ dhoto$ chmod 755 coba.sh
```

```
iseng4h-macbookpro:~ dhoto$ ./coba.sh
```

```
Coba Program
```

```
iseng4h-macbookpro:~ dhoto$ gcc -o coba coba.c
```

```
iseng4h-macbookpro:~ dhoto$ ./coba
```

```
Coba Program
```

```
iseng4h-macbookpro:~ dhoto$
```

Script tidak perlu compile,
cukup ganti permission ke
eksekusi sekali saja

Program setelah ganti
source, harus melakukan
compile dengan gcc

SHELL SCRIPTING

Menggunakan BASH
shell

Hello world

```
#!/bin/bash  
echo "Hello world"  
~  
~
```

Menjalankan program
shell script :
./helloworld.sh

```
iseng4h-macbookpro:~ dphoto$ cat helloworld.sh  
#!/bin/bash  
echo "Hello world"  
iseng4h-macbookpro:~ dphoto$ chmod 755 helloworld.sh  
iseng4h-macbookpro:~ dphoto$ ./helloworld.sh  
Hello world  
iseng4h-macbookpro:~ dphoto$
```

Variable dan argumen

Variable varnama

Mengisikan variable dengan \$1
\$1 = variable untuk argumen

Menjalankan program dengan argumen

```
iseng4h-macbookpro:~ dhoto$ cat nama.sh
#!/bin/bash

varnama=$1

echo "Nama saya $varnama"
iseng4h-macbookpro:~ dhoto$ ./nama.sh
Nama saya
iseng4h-macbookpro:~ dhoto$ ./nama.sh dhoto
Nama saya dhoto
iseng4h-macbookpro:~ dhoto$
```

Input

read

Variable varnama

```
iseng4h-macbookpro:~ dhoto$ cat nama.sh
#!/bin/bash

echo -n "Masukkan namamu "
read varnama
echo "Nama saya $varnama"
iseng4h-macbookpro:~ dhoto$ ./nama.sh
Masukkan namamu Dhoto
Nama saya Dhoto
iseng4h-macbookpro:~ dhoto$ █
```

Flow control (1) - if

```
iseng4h-macbookpro:~ dhoto$ cat nama.sh  
#!/bin/bash
```

```
echo -n "Masukkan namamu "  
read varnama  
echo "Nama saya $varnama"
```

```
if [ $varnama == "Dhoto" ]  
then  
    echo "Jago shell"  
else  
    echo "Belajaran"  
fi
```

```
iseng4h-macbookpro:~ dhoto$ ./nama.sh
```

```
Masukkan namamu Dhoto  
Nama saya Dhoto  
Jago shell
```

```
iseng4h-macbookpro:~ dhoto$ ./nama.sh
```

```
Masukkan namamu kamu  
Nama saya kamu  
Belajaran
```

```
iseng4h-macbookpro:~ dhoto$
```

Pembanding

- Matematika <, >, =, <=, >=
- < → -lt
- > → -gt
- = → -eq
- <= → -le
- >= → -ge

Flow control (2) - case

Pilihan

```
iseng4h-macbookpro:~ dhoto$ cat kamusukaprogram.sh
#!/bin/bash

case $1 in
"ya") echo "Anak pintar" ;;
"sedikit") echo "Kamu anak belajaran" ;;
*) echo "Ga jelas" ;;
esac
iseng4h-macbookpro:~ dhoto$ ./kamusukaprogram.sh ya
Anak pintar
iseng4h-macbookpro:~ dhoto$ ./kamusukaprogram.sh sedikit
Kamu anak belajaran
iseng4h-macbookpro:~ dhoto$ ./kamusukaprogram.sh adsfi83
Ga jelas
iseng4h-macbookpro:~ dhoto$ █
```

Diakhiri ;;

Loop (1) – while (uncountable)

```
iseng4h-macbookpro:~ dhoto$ cat kamusuk
#!/bin/bash

RESPONSE=
while [ -z "$RESPONSE" ] ;
do
    echo "Enter the name of a directory where your files are located "
    read RESPONSE
    if [ ! -d "$RESPONSE" ] ; then
        echo "ERROR: Please enter a directory pathname."
        RESPONSE=
    fi
done
iseng4h-macbookpro:~ dhoto$ ./kamusukaprogram.sh
Enter the name of a directory where your files are located
hehehe
ERROR: Please enter a directory pathname.
Enter the name of a directory where your files are located
/Users/dhoto
iseng4h-macbookpro:~ dhoto$
```

Melakukan
perulangan
dengan
syarat

Diulang terus
sampai
mengisi nama
direktori

Loop (2) – for (countable)

Perulangan
yang
terdefinisi

Suatu list
yang
berurutan

```
iseng4h-macbookpro:~ dhoto$ cat kamus
#!/bin/bash

for i in `ls $1`
do
  du -sh $1/$i
done
iseng4h-macbookpro:~ dhoto$ ./kamusukaprogram.sh Dropbox
1.0M   Dropbox/Apps
343M   Dropbox/Back-UP-TA
344K   Dropbox/Camera
 65M   Dropbox/Documents
 8.0K  Dropbox/Downloads
1.3G   Dropbox/ER2C-IoUT
315M   Dropbox/ER2C-ROS
2.2G   Dropbox/ER2C-VRLAB
1.4G   Dropbox/ER2C.share
du: Dropbox/Getting: No such file or directory
du: Dropbox/Started.pdf: No such file or directory
348K   Dropbox/Icon
950M   Dropbox/LCEN2015
 11M   Dropbox/Musics
3.5G   Dropbox/PENS
 22M   Dropbox/Photos
180M   Dropbox/Public
 33M   Dropbox/Putri-shared
  0B   Dropbox/ROS-ER2C
  0B   Dropbox/ROV_IoT_ER2C
2.0M   Dropbox/dhoto
341M   Dropbox/papers
  0B   Dropbox/vr_lab
iseng4h-macbookpro:~ dhoto$
```

Redirect

Mengisi baru
!!! Perhatikan
waktunya

Tanda >

```
iseng4h-macbookpro:~ dhoto$ { date; uptime; who ; } > mylog
iseng4h-macbookpro:~ dhoto$ cat mylog
Tue Oct 6 14:55:41 WIB 2015
14:55 up 8 days, 6:02, 2 users, load averages: 1.61 1.55 1.47
dhoto console Sep 28 08:53
dhoto ttys000 Oct 6 12:28
iseng4h-macbookpro:~ dhoto$ { date; uptime; who ; } > mylog
iseng4h-macbookpro:~ dhoto$ cat mylog
Tue Oct 6 14:55:52 WIB 2015
14:55 up 8 days, 6:03, 2 users, load averages: 1.47 1.52 1.46
dhoto console Sep 28 08:53
dhoto ttys000 Oct 6 12:28
iseng4h-macbookpro:~ dhoto$ { date; uptime; who ; } >> mylog
iseng4h-macbookpro:~ dhoto$ cat mylog
Tue Oct 6 14:55:52 WIB 2015
14:55 up 8 days, 6:03, 2 users, load averages: 1.47 1.52 1.46
dhoto console Sep 28 08:53
dhoto ttys000 Oct 6 12:28
Tue Oct 6 14:55:59 WIB 2015
14:55 up 8 days, 6:03, 2 users, load averages: 1.44 1.51 1.44
dhoto console Sep 28 08:53
dhoto ttys000 Oct 6 12:28
iseng4h-macbookpro:~ dhoto$ █
```

Terisi data
baru
dibawahnya

Tanda >>

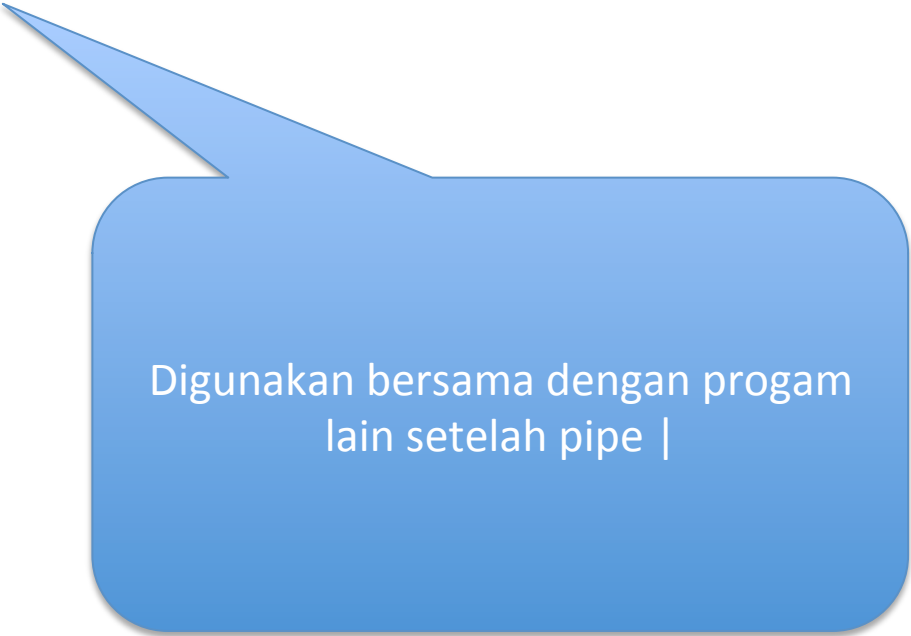
Pipe |

PIPE (|), memberikan output dari program pertama ke program berikutnya seperti text filter.
Ex: output dari ifconfig di hitung jumlah kata oleh program wc

```
iseng4h-macbookpro:~ dhoto$ ifconfig en0
en0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    ether 14:10:9f:d6:df:3f
    inet6 fe80::1610:9fff:fed6:df3f%en0 prefixlen 64 scopeid 0x4
    inet 10.252.62.63 netmask 0xffffffff broadcast 10.252.62.255
    nd6 options=1<PERFORMNUD>
    media: autoselect
    status: active
iseng4h-macbookpro:~ dhoto$ ifconfig en0 | wc
 7      24      284
iseng4h-macbookpro:~ dhoto$ ifconfig en0 | grep inet
    inet6 fe80::1610:9fff:fed6:df3f%en0 prefixlen 64 scopeid 0x4
    inet 10.252.62.63 netmask 0xffffffff broadcast 10.252.62.255
iseng4h-macbookpro:~ dhoto$ █
```

Text Filter

- sort
- grep
- uniq
- tr
- head
- tail



Digunakan bersama dengan program lain setelah pipe |

Function

Fungsi matematika

Mengisi variable yang baru

```
iseng4h-macbookpro:~ dhoto$ cat kamusukaprogram.sh
#!/bin/bash
x=100
y=200

math(){
  # local variable x and y with passed args
  local x=$1
  local y=$2
  echo $(( $x + $y ))
}

echo "x: $x and y: $y"
# call function

echo "Calling math() with x: $x and y: $y"
math $x $y

x=$1
y=$2

# x and y are not modified by math()
echo "x: $x and y: $y after calling math()"
math $x $y
iseng4h-macbookpro:~ dhoto$ ./kamusukaprogram.sh 20 30
x: 100 and y: 200
Calling math() with x: 100 and y: 200
300
x: 20 and y: 30 after calling math()
50
iseng4h-macbookpro:~ dhoto$
```

Math - bc

```
iseng4h-macbookpro:~ dhoto$ echo "5 + 5" | bc
10
iseng4h-macbookpro:~ dhoto$ echo "5.5 - 4.7"| bc
.8
iseng4h-macbookpro:~ dhoto$ echo "10 * 5" | bc
50
iseng4h-macbookpro:~ dhoto$ echo "10 / 2 " | bc
5
iseng4h-macbookpro:~ dhoto$ echo "10 % 3 " | bc
1
iseng4h-macbookpro:~ dhoto$ echo "5 ^ 2"| bc
25
iseng4h-macbookpro:~ dhoto$ echo "sqrt(4)"| bc
2
iseng4h-macbookpro:~ dhoto$ echo "5 + 3 - 2 * 4" | bc
0
iseng4h-macbookpro:~ dhoto$ c=`echo "1 + 2 + 3"| bc`
iseng4h-macbookpro:~ dhoto$ echo $c
6
iseng4h-macbookpro:~ dhoto$ █
```

Penggunaan bc

SELAMAT BELAJAR SHELL