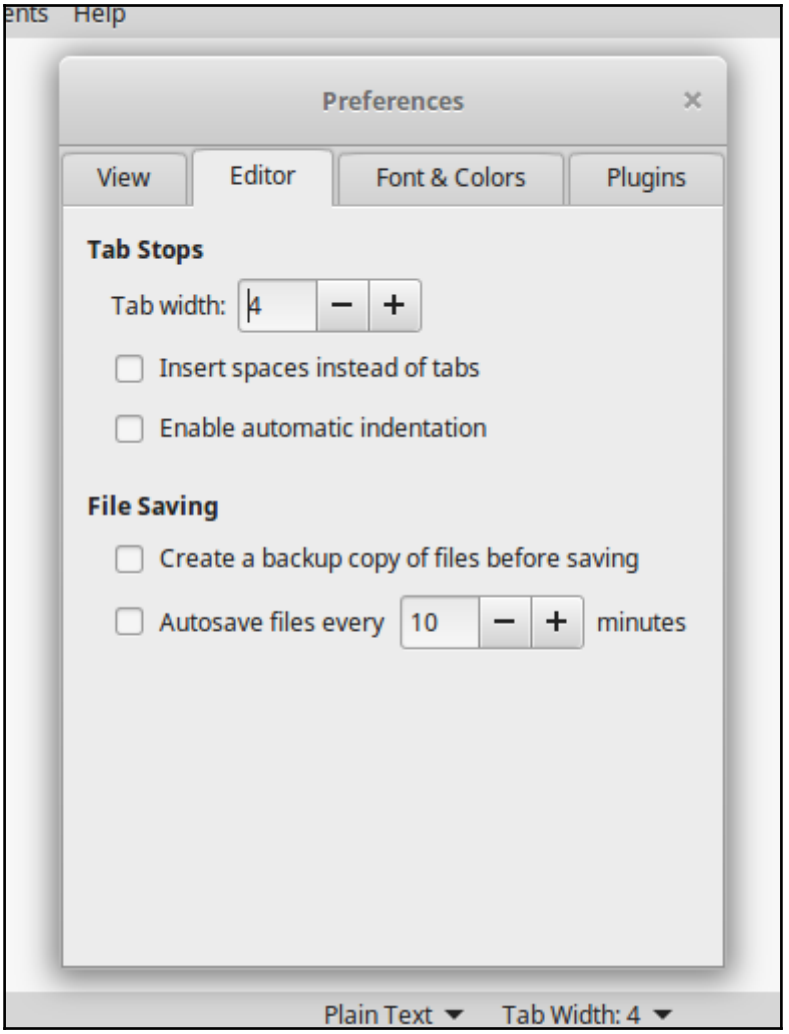
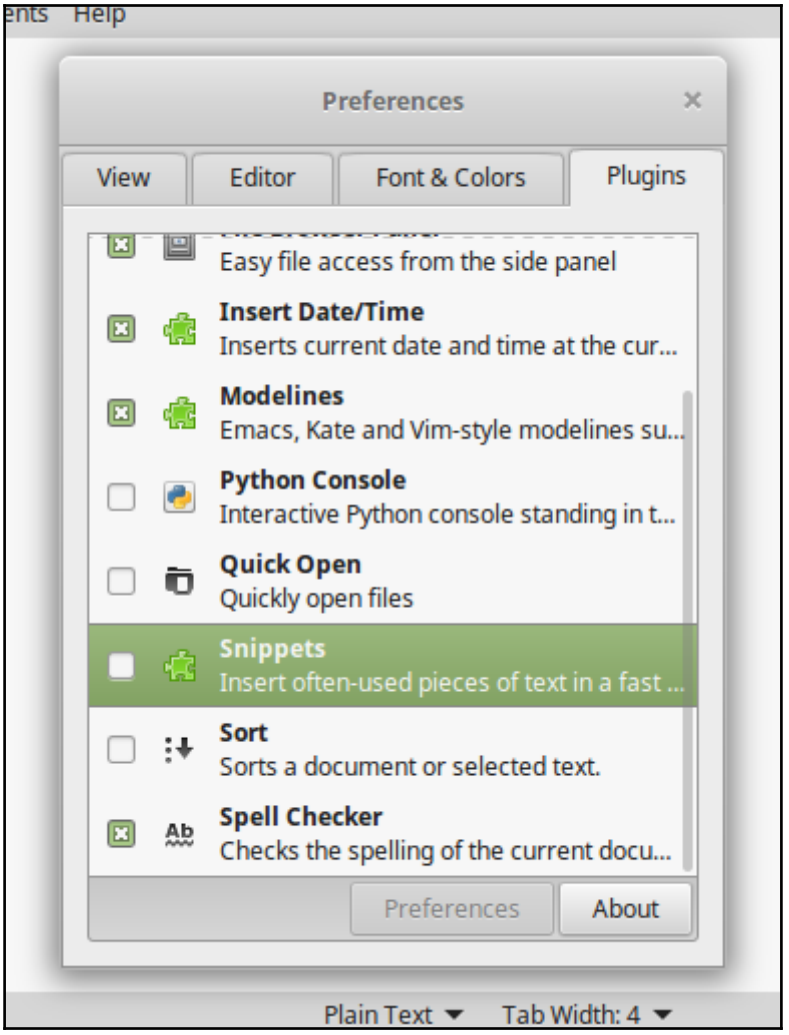
Chapter 1: The What and Why of Scripting with Bash

```
pi@pilabs /tmp $ type ls quote pwd do id
ls is aliased to `ls --color=auto'
quote is a function
quote ()
{
    local quoted=${1//\'/\'\\\'\'};
    printf "'%s'" "$quoted"
}
pwd is a shell builtin
do is a shell keyword
id is /usr/bin/id
pi@pilabs /tmp $ _
```


ents Help
Preferences
View
Editor
Font & Colors
Plugins
Tab Stops
Tab width: 4
Insert spaces instead of tabs
Enable automatic indentation
File Saving
Create a backup copy of files before saving
Autosave files every 10 minutes
Plain Text
Tab Width: 4




```
#!/bin/bash
echo "Hello World"
exit 0
```

```
pi@pilabs ~ $ chmod +x $HOME/bin/hello1.sh
pi@pilabs ~ $ hello1.sh
Hello World
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ type hello1.sh
hello1.sh is hashed (/home/pi/bin/hello1.sh)
pi@pilabs ~ $ type -a hello1.sh
hello1.sh is /home/pi/bin/hello1.sh
pi@pilabs ~ $ type -t hello1.sh
file
pi@pilabs ~ $ _
```

```
#!/bin/bash
echo "Hello $1"
exit 0
~
```

```
pi@pilabs ~ $ hello2.sh fred
Hello fred
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $
pi@pilabs ~ $ hello2.sh fred wilma betty barney
Hello fred wilma betty barney
pi@pilabs ~ $ _
```

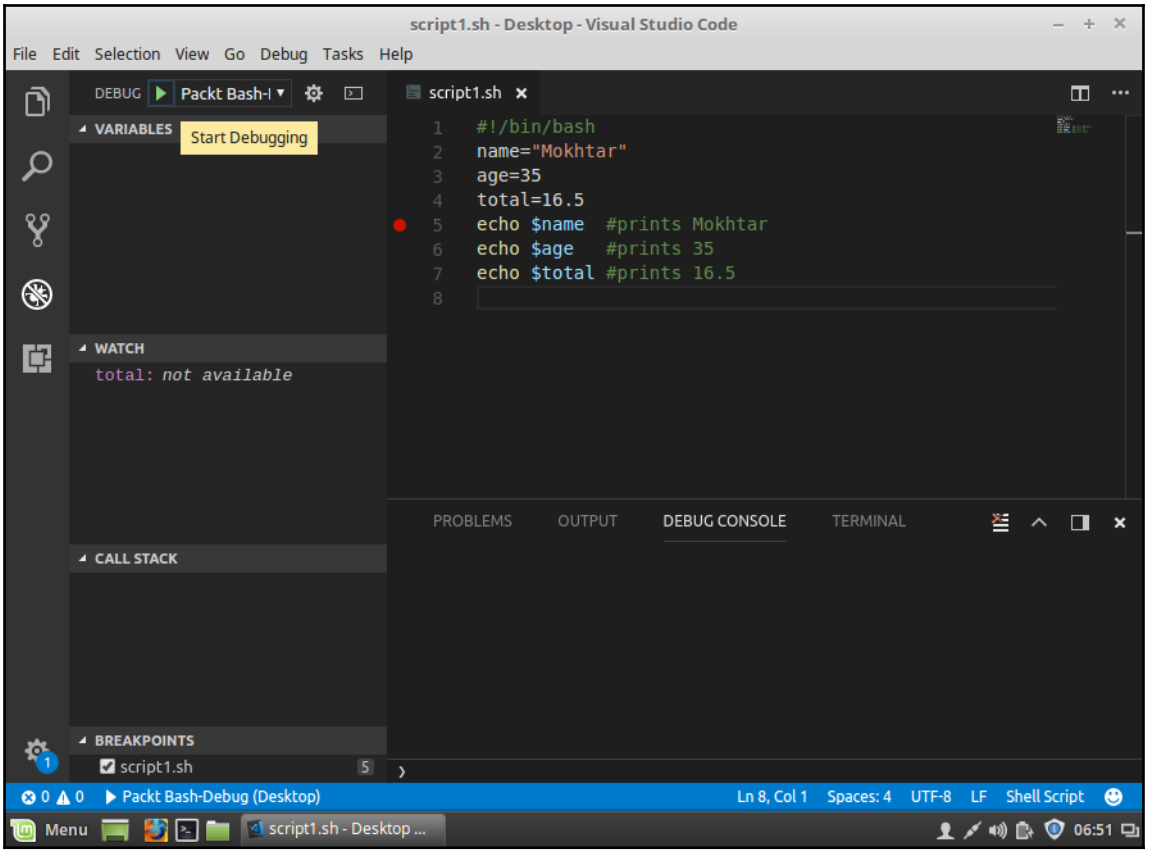
```
pi@pilabs ~ $ echo "$USER earns $4"
pi earns
pi@pilabs ~ $ echo '$USER earns $4'
$USER earns $4
pi@pilabs ~ $ echo "$USER earns \$4"
pi earns $4
pi@pilabs ~ $ _
```

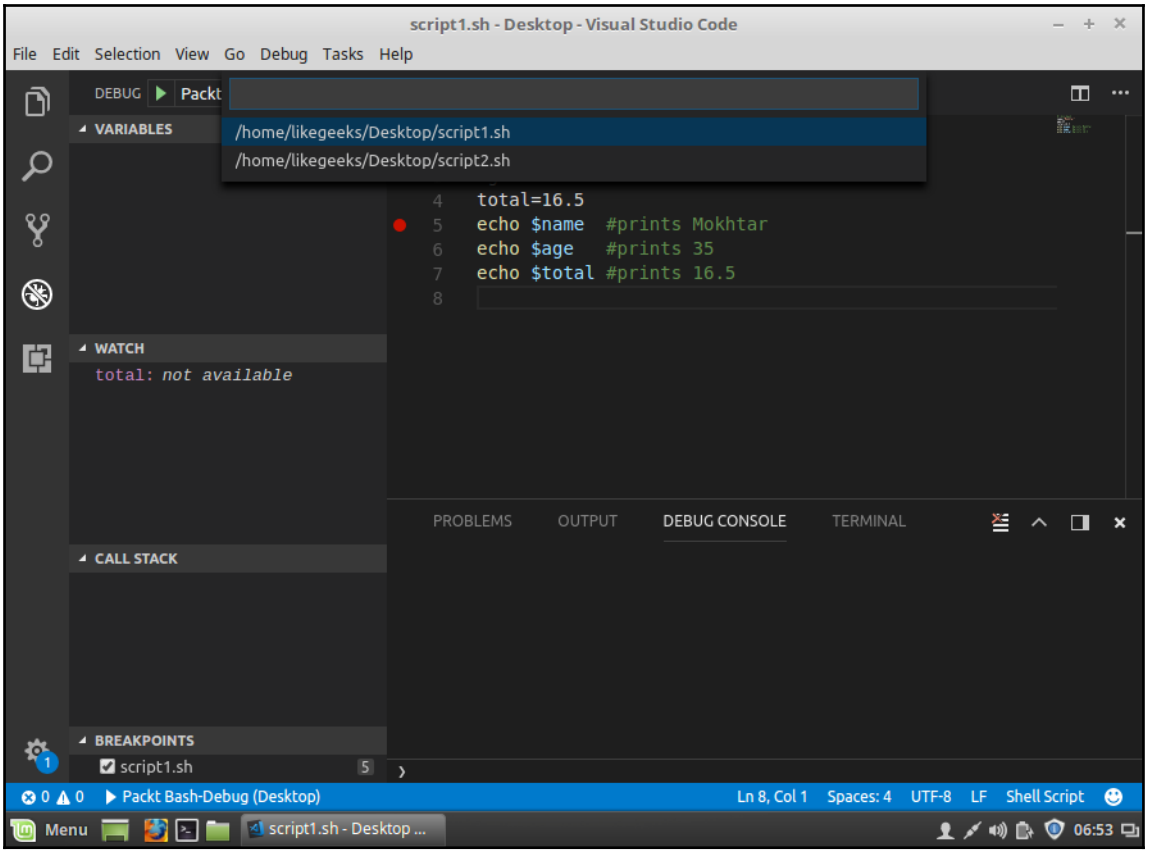
```
pi@pilabs ~ $ hello2.sh fred
You are using /home/pi/bin/hello2.sh
Hello fred
pi@pilabs ~ $ _
```

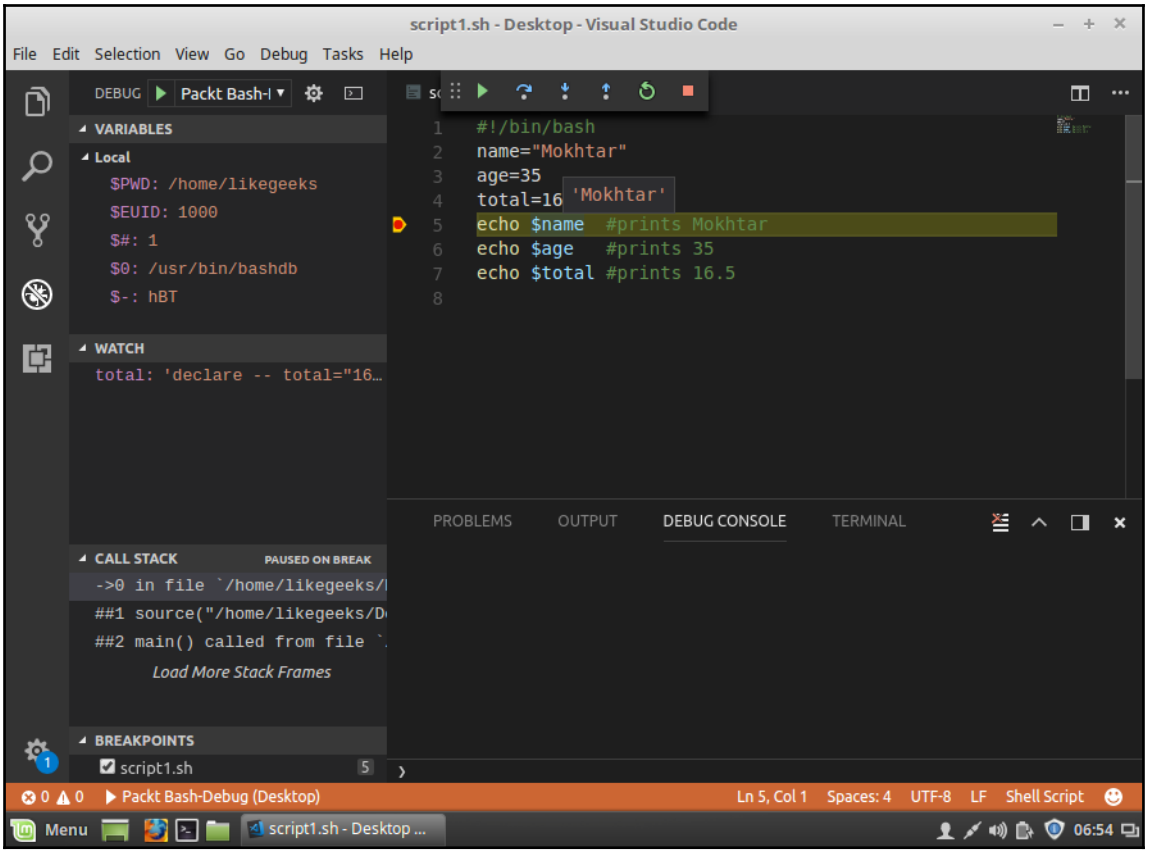
```
pi@pilabs ~ $ hello2.sh fred
You are using hello2.sh
Hello fred
```

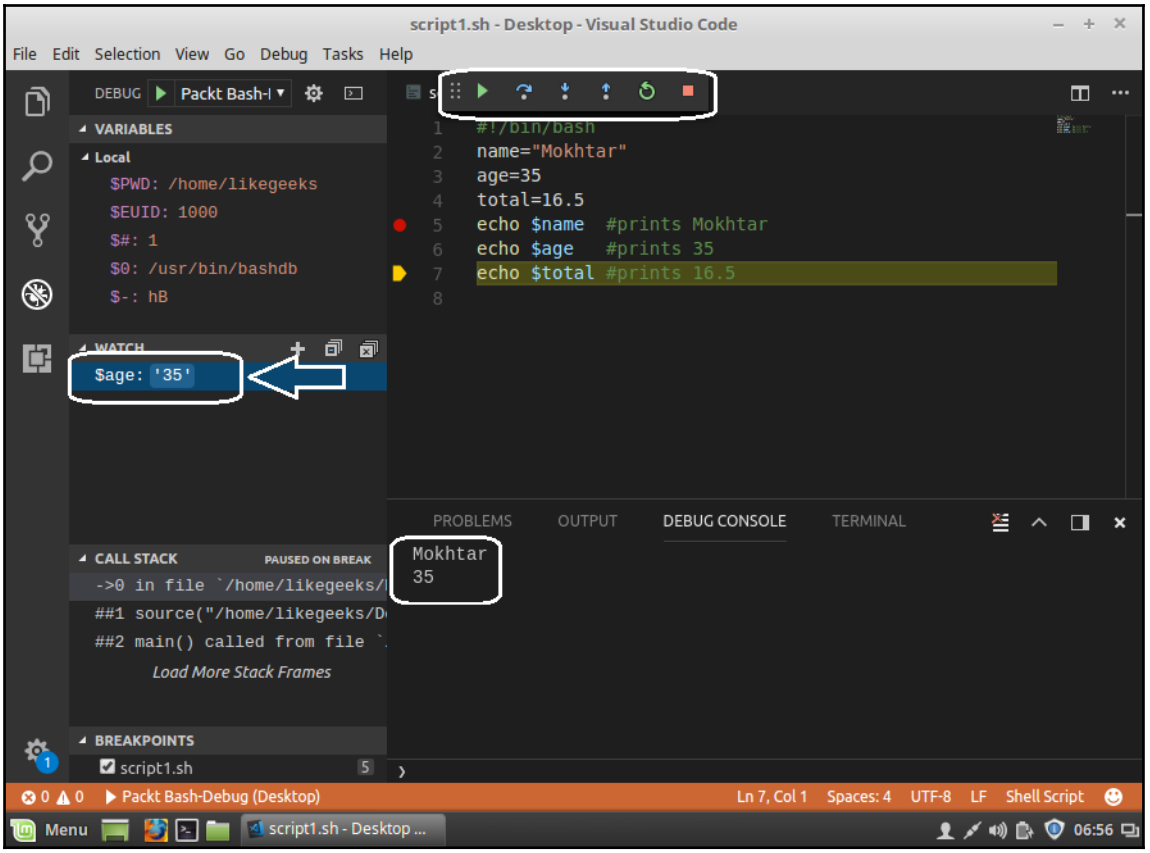
```
pi@pilabs ~ $ bash -v $HOME/bin/hello2.sh fred
#!/bin/bash
echo "You are using $(basename $0)"
basename $0)"
basename $0)
basename $0
You are using hello2.sh
echo "Hello $*"
Hello fred
exit 0
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ bash -x $HOME/bin/hello2.sh fred
++ basename /home/pi/bin/hello2.sh
+ echo 'You are using hello2.sh'
You are using hello2.sh
+ echo 'Hello fred'
Hello fred
+ exit 0
pi@pilabs ~ $ _
```


script1.sh - Desktop - Visual Studio Code
File Edit Selection View Go Debug Tasks Help
DEBUG
Packt Bash-I
VARIABLES
Start Debugging
WATCH
total: not available
CALL STACK
BREAKPOINTS
script1.sh 5
script1.sh
#!/bin/bash
name="Mokhtar"
age=35
total=16.5
echo $name #prints Mokhtar
echo $age #prints 35
echo $total #prints 16.5
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
0 0 Packt Bash-Debug (Desktop)
Ln 8, Col 1 Spaces: 4 UTF-8 LF Shell Script
Menu
script1.sh - Desktop ...
06:51


script1.sh - Desktop - Visual Studio Code
File Edit Selection View Go Debug Tasks Help
DEBUG Packt
/home/likegeeks/Desktop/script1.sh
/home/likegeeks/Desktop/script2.sh
VARIABLES
WATCH
total: not available
CALL STACK
BREAKPOINTS
script1.sh 5
4 total=16.5
5 echo $name #prints Mokhtar
6 echo $age #prints 35
7 echo $total #prints 16.5
8
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
0 0 Packt Bash-Debug (Desktop)
Ln 8, Col 1 Spaces: 4 UTF-8 LF Shell Script
Menu
script1.sh - Desktop ...
06:53

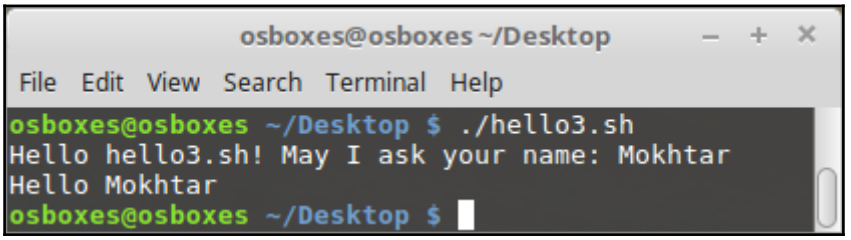

script1.sh - Desktop - Visual Studio Code
File Edit Selection View Go Debug Tasks Help
DEBUG Packt Bash-I
VARIABLES
Local
$PWD: /home/likegeeks
$EUID: 1000
$#: 1
$0: /usr/bin/bashdb
$-: hBT
WATCH
total: 'declare -- total="16…
CALL STACK PAUSED ON BREAK
->0 in file `/home/likegeeks/
##1 source("/home/likegeeks/D
##2 main() called from file `
Load More Stack Frames
BREAKPOINTS
script1.sh 5
1 #!/bin/bash
2 name="Mokhtar"
3 age=35
4 total=16 'Mokhtar'
5 echo $name #prints Mokhtar
6 echo $age #prints 35
7 echo $total #prints 16.5
8
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
0 0 Packt Bash-Debug (Desktop)
Ln 5, Col 1 Spaces: 4 UTF-8 LF Shell Script
Menu
script1.sh - Desktop ...
06:54


script1.sh - Desktop - Visual Studio Code
File Edit Selection View Go Debug Tasks Help
DEBUG Packt Bash-I
VARIABLES
Local
$PWD: /home/likegeeks
$EUID: 1000
$#: 1
$0: /usr/bin/bashdb
$-: hB
WATCH
$age: '35'
CALL STACK PAUSED ON BREAK
->0 in file `/home/likegeeks/
##1 source("/home/likegeeks/D
##2 main() called from file `
Load More Stack Frames
BREAKPOINTS
script1.sh 5
#!/bin/bash
name="Mokhtar"
age=35
total=16.5
echo $name #prints Mokhtar
echo $age #prints 35
echo $total #prints 16.5
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Mokhtar
35
Packt Bash-Debug (Desktop)
Ln 7, Col 1 Spaces: 4 UTF-8 LF Shell Script
Menu
script1.sh - Desktop ...
06:56

Chapter 2: Creating Interactive Scripts

```
pi@pilabs ~ $ echo

pi@pilabs ~ $ _
```

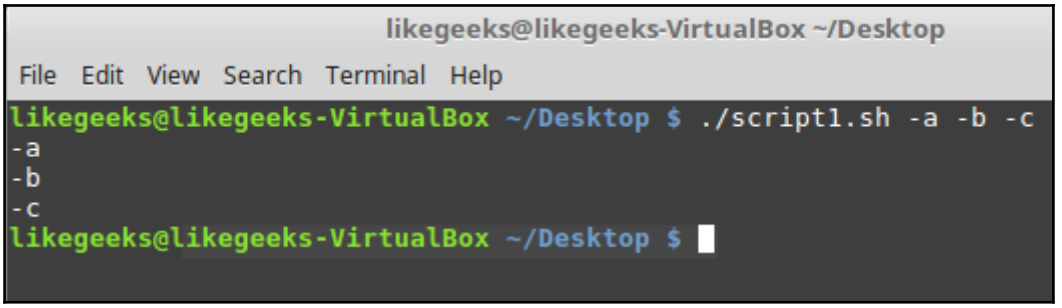
```
pi@pilabs ~ $ echo -e "Which directory do you want to use? \c"
Which directory do you want to use? pi@pilabs ~ $ _
```

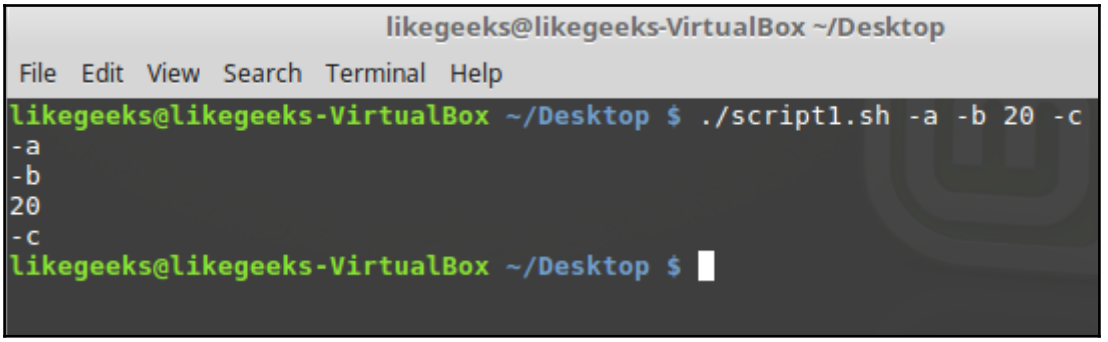


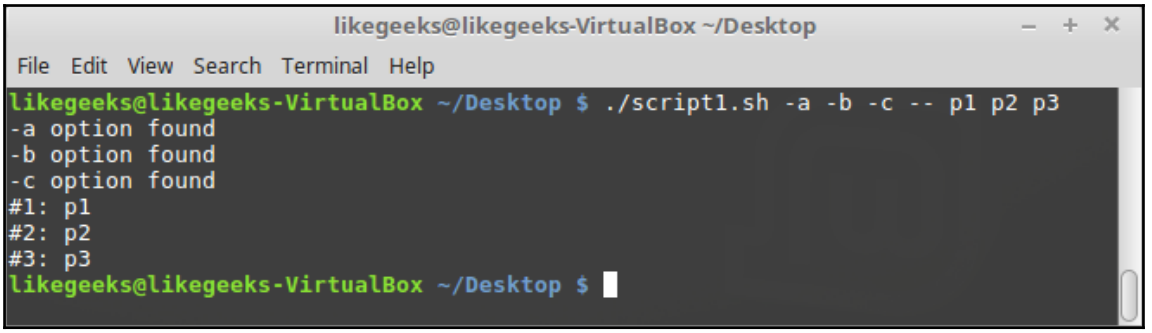

```
pi@pilabs ~ $ hello3.sh
May I ask your name: fred
Hello fred
Press any key to continue
pi@pilabs ~ $ _
```

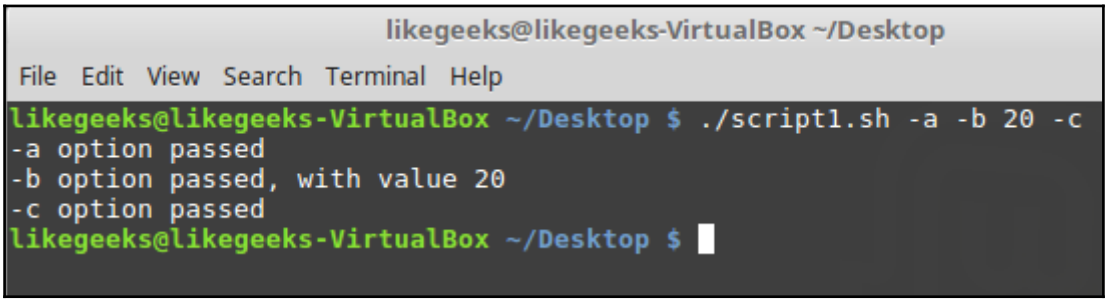
We see the entered text

With -s we don't see the entered text




likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./script1.sh -a -b 20 -c
-a
-b
20
-c
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./script1.sh -a -b -c -- p1 p2 p3
-a option found
-b option found
-c option found
#1: p1
#2: p2
#3: p3
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./script1.sh -a -b 20 -c
-a option passed
-b option passed, with value 20
-c option passed
likegeeks@likegeeks-VirtualBox ~/Desktop $

```
#!/bin/bash
# Author: @theurbanpenguin
# Web: www.theurbapenguin.com
# Script to prompt to back up files and location
# The files will be search on from the user's home
# directory and can only be backed up to a directory
# within $HOME
# Last Edited: July 4 2015
read -p "Which file types do you want to backup " file_suffix
read -p "Which directory do you want to backup to " dir_name
# The next lines creates the directory if it does not exist
test -d $HOME/$dir_name || mkdir -m 700 $HOME/$dir_name
# The find command will copy files the match the
# search criteria ie .sh . The -path, -prune and -o
# options are to exclude the backdirectory from the
# backup.
find $HOME -path $HOME/$dir_name -prune -o \
 -name "*$file_suffix" -exec cp {} $HOME/$dir_name/ \;
exit 0
```

```
pi@pilabs ~ $ backup.sh
Which file types do you want to backup .sh
Which directory do you want to backup to backup
pi@pilabs ~ $ ls $HOME/backup
autogunk.sh         ECCcertgen.sh       irix.sh
autoungunk.sh       ECC-RSAcertgen.sh   launcher.sh
backup.sh           fixNT.sh            mkcerts.sh
bat.sh              FreeBSD.sh          mksmime-certs.sh
c89.sh              hello1.sh           opensslwrap.sh
CA.sh               hello2.sh           point.sh
connect_server.sh   hello3.sh           profile.sh
cygwin.sh           hpux10-cc.sh        pthread2.sh
do_ms.sh            install.sh          pthread.sh
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $
pi@pilabs ~ $ ping_server.sh
Which server should be pinged localhost
pi@pilabs ~ $ ping_server.sh
Which server should be pinged 1.2.3.4
Server Dead
pi@pilabs ~ $ _
```

```
andrew@web:~$ ./run_mysql.sh
MySQL User: andrew
MySQL Password:
MySQL Command: SHOW TABLES;
MySQL DB: wordpress
Tables_in_wordpress
wp_cleanup_optimizer_block_range_ip
wp_cleanup_optimizer_block_single_ip
wp_cleanup_optimizer_db_scheduler
wp_cleanup_optimizer_licensing
wp_cleanup_optimizer_login_log
wp_cleanup_optimizer_plugin_settings
wp_cleanup_optimizer_wp_scheduler
```

Chapter 3: Conditions Attached

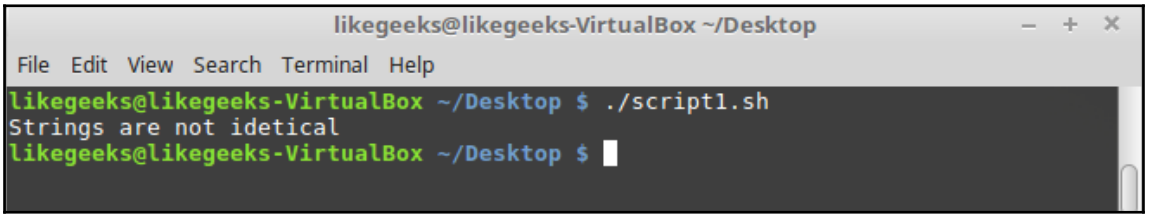
```
pi@pilabs: ~
pi@pilabs ~ $ who | grep pi > /dev/null 2>&1 && write pi < message.txt

Message from pi@pilabs.theurbanpenguin.com on pts/0 at 10:42 ...
I see you are logged on then!

EOF
pi@pilabs ~ $ _
```

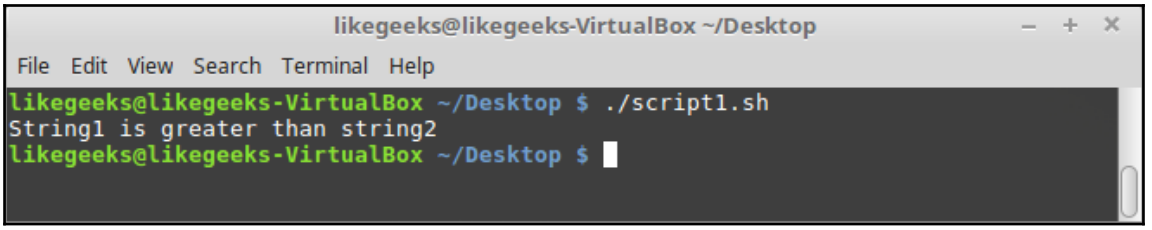
```
#!/bin/bash
echo "You are using $(basename $0)"
test -z $1 || echo "Hello $1"
exit 0
~
```

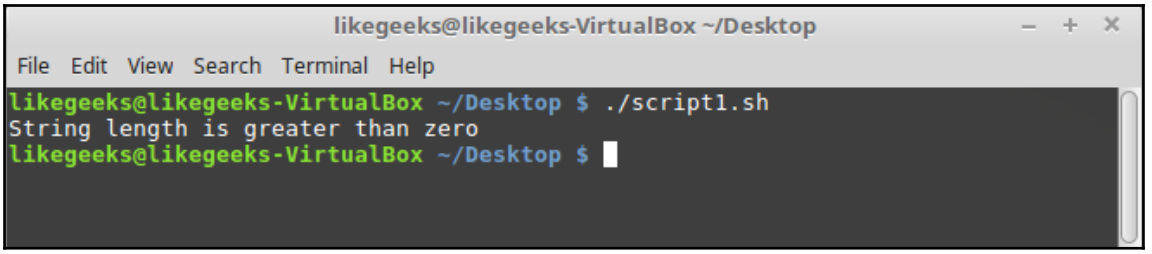
```
pi@pilabs: ~/bin
pi@pilabs ~/bin $ hello4.sh
You are using hello4.sh
pi@pilabs ~/bin $ hello4.sh bob
You are using hello4.sh
Hello bob
pi@pilabs ~/bin $ _
```

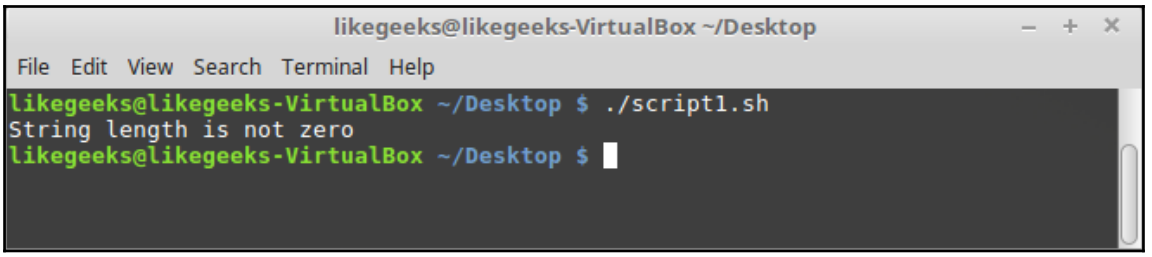
```
#!/bin/bash
# Welcome script to display a message to users on login
# Author: @theurbanpenguin
# Date: 1/1/1971
if [ $# -lt 1 ] ; then
  echo “Usage: $0 <name>”
  exit 1
fi
echo “Hello $1”
exit 0
```

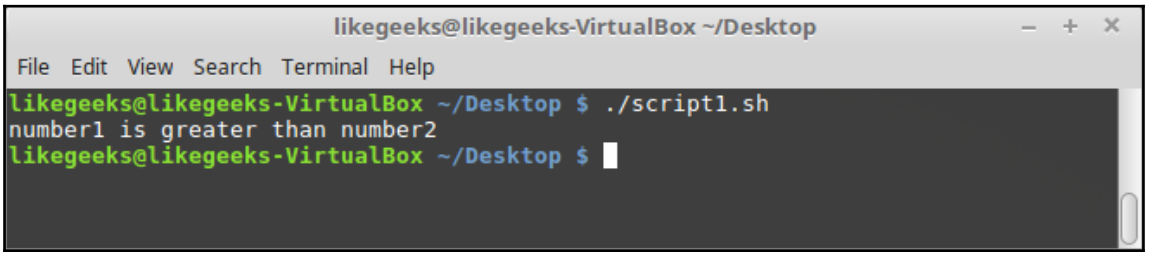
```
pi@pilabs ~ $ hello5.sh
Usage: /home/pi/bin/hello5.sh <name>
pi@pilabs ~ $ hello5.sh  fred
Hello fred
pi@pilabs ~ $ _
```

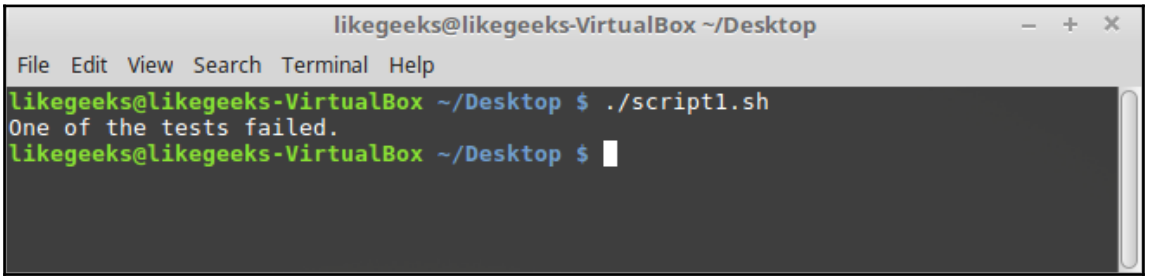


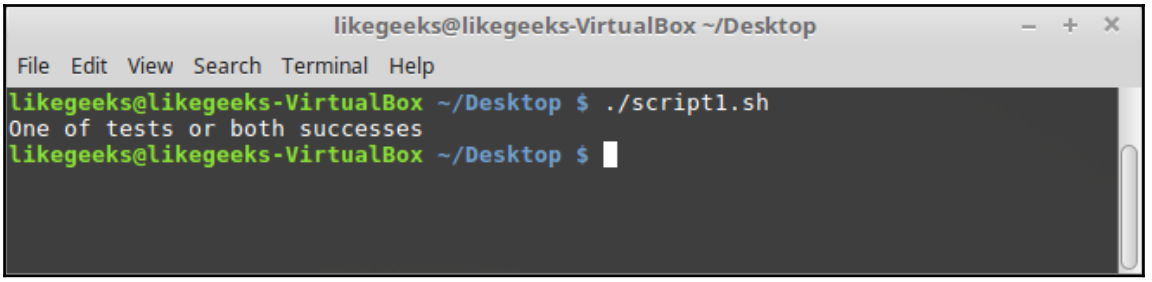



likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./script1.sh
String length is greater than zero
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./script1.sh
String length is not zero
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./script1.sh
number1 is greater than number2
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./script1.sh
One of the tests failed.
likegeeks@likegeeks-VirtualBox ~/Desktop $




```
pi@pilabs ~ $ backup2.sh
Choose H, M or L compression M_
```

```
pi@pilabs ~/bin $ grade.sh Bob b
Bob is a star pupil
pi@pilabs ~/bin $ grade.sh Bob D
Bob needs to try a little harder!
pi@pilabs ~/bin $ grade.sh Bob e
Bob could do a lot better next year
pi@pilabs ~/bin $ grade.sh Bob 5
Grade could not be evaluated for Bob 5
pi@pilabs ~/bin $ _
```

```
pi@pilabs ~ $ search.sh /etc/ntp.conf ^server c
Counting the matches in /etc/ntp.conf of ^server
4
pi@pilabs ~ $ _
```

Chapter 4: Creating Code Snippets

pi@pilabs: ~

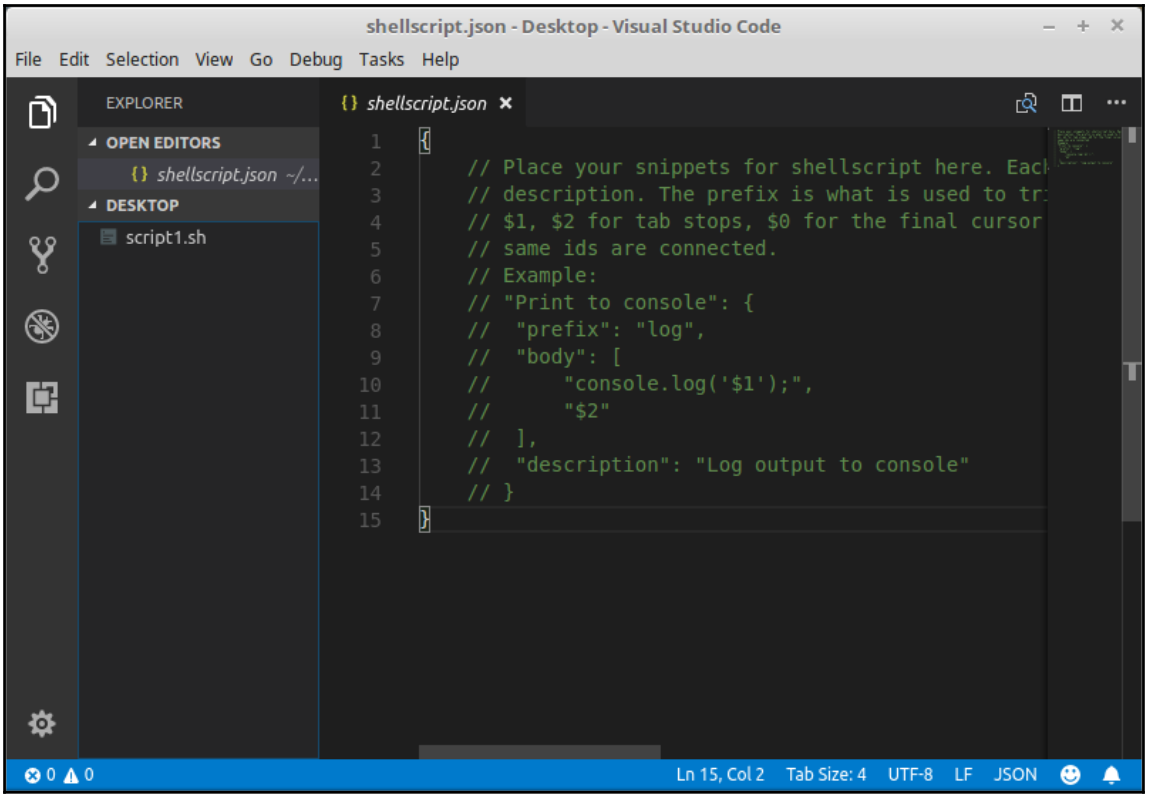
```
set showmode nohlsearch
set autoindent tabstop=4
set expandtab
syntax on
abbr _sh #!/bin/bash
```

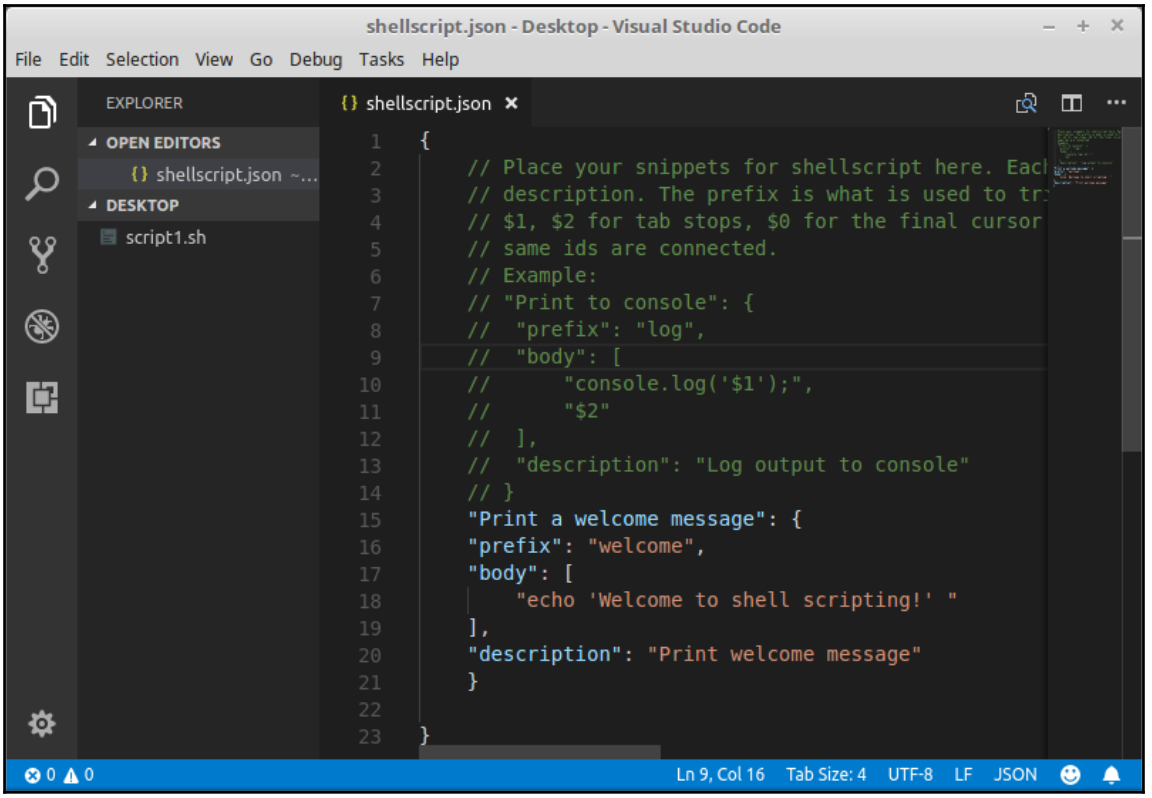
```
pi@pilabs ~ $ echo -e "\033[31mError\033[0m"
Error
```

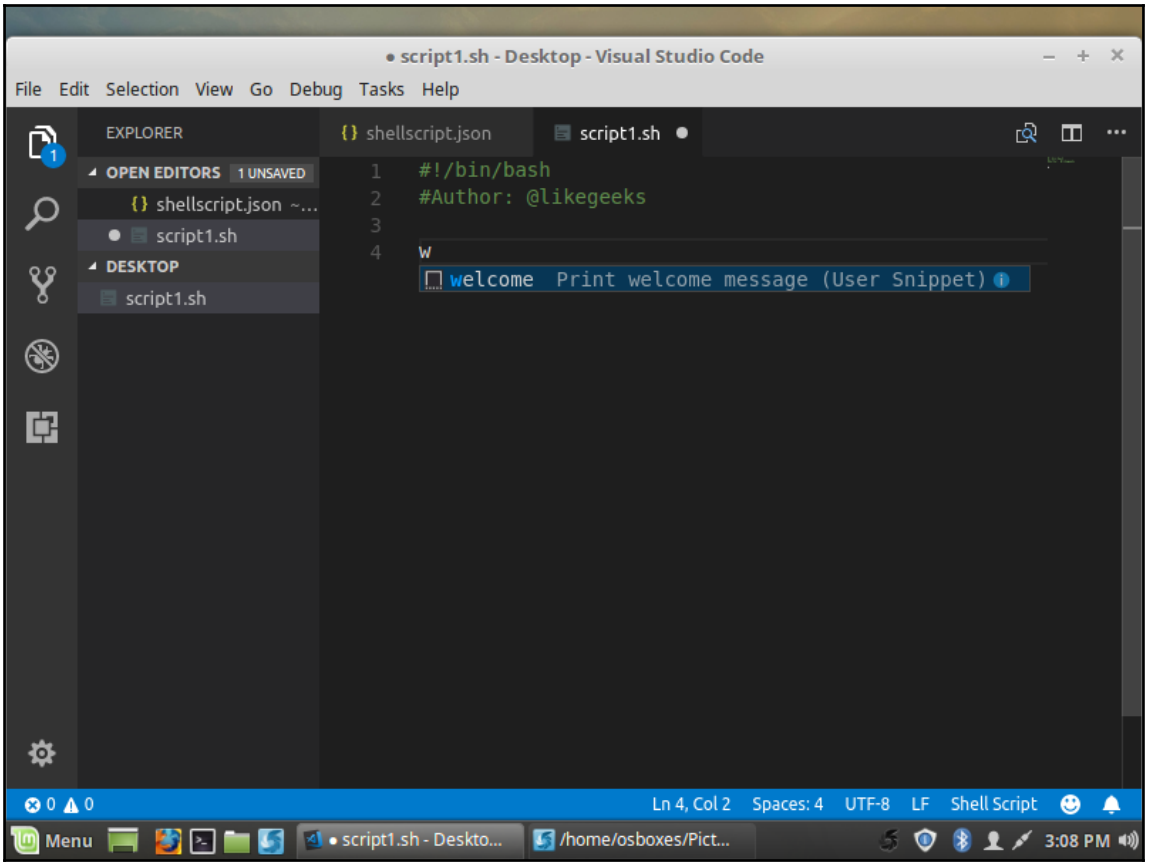
pi@pilabs: ~/bin

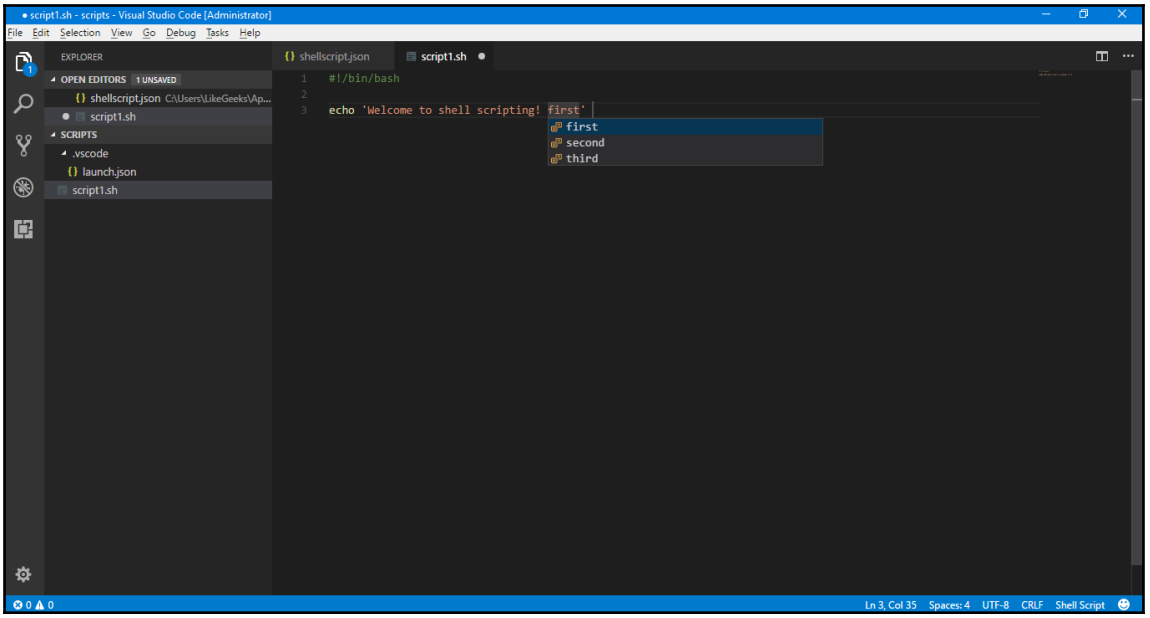
```
#!/bin/bash
# Welcome script to display a message to users on login
# Author: @theurbanpenguin
# Date: 1/1/1971
source $HOME/snippets/color
if [ $# -lt 1 ] ; then
  echo -e "${RED}Usage: $0 <name>$RESET"
  exit 1
fi
echo -e "${GREEN}Hello $1$RESET"
exit 0
```

```
pi@pilabs ~/bin $ hello7.sh fred
Hello fred
pi@pilabs ~/bin $ hello7.sh
Usage: /home/pi/bin/hello7.sh <name>
pi@pilabs ~/bin $ _
```


shellscript.json - Desktop - Visual Studio Code
File Edit Selection View Go Debug Tasks Help
EXPLORER
OPEN EDITORS
shellscript.json ~/...
DESKTOP
script1.sh
shellscript.json
{
// Place your snippets for shellscript here. Eac
// description. The prefix is what is used to tr
// $1, $2 for tab stops, $0 for the final cursor
// same ids are connected.
// Example:
// "Print to console": {
// "prefix": "log",
// "body": [
// "console.log('$1');",
// "$2"
//],
// "description": "Log output to console"
// }
}
0 0
Ln 15, Col 2
Tab Size: 4
UTF-8
LF
JSON


shellscript.json - Desktop - Visual Studio Code
File Edit Selection View Go Debug Tasks Help
EXPLORER
OPEN EDITORS
shellscript.json ~...
DESKTOP
script1.sh
shellscript.json
{
// Place your snippets for shellscript here. Eac
// description. The prefix is what is used to tr
// $1, $2 for tab stops, $0 for the final cursor
// same ids are connected.
// Example:
// "Print to console": {
// "prefix": "log",
// "body": [
// "console.log('$1');",
// "$2"
//],
// "description": "Log output to console"
// }
"Print a welcome message": {
"prefix": "welcome",
"body": [
"echo 'Welcome to shell scripting!' "
],
"description": "Print welcome message"
}
}
0 0
Ln 9, Col 16
Tab Size: 4
UTF-8
LF
JSON


• script1.sh - Desktop - Visual Studio Code
File Edit Selection View Go Debug Tasks Help
EXPLORER
OPEN EDITORS 1 UNSAVED
shellscript.json ~...
script1.sh
DESKTOP
script1.sh
shellscript.json
script1.sh
1 #!/bin/bash
2 #Author: @likegeeks
3
4 w
welcome Print welcome message (User Snippet)
0 0
Ln 4, Col 2 Spaces: 4 UTF-8 LF Shell Script
Menu
• script1.sh - Deskto...
/home/osboxes/Pict...
3:08 PM


script1.sh - scripts - Visual Studio Code [Administrator]
File Edit Selection View Go Debug Tasks Help
EXPLORER
OPEN EDITORS 1 UNSAVED
shellscript.json C:\Users\LikeGeeks\Ap...
script1.sh
SCRIPTS
.vscode
launch.json
script1.sh
shellscript.json
script1.sh
#!/bin/bash
echo 'Welcome to shell scripting! first'
first
second
third
Ln 3, Col 35 Spaces: 4 UTF-8 CRLF Shell Script

Chapter 5: Alternative Syntax

```
pi@pilabs ~ $ type -a [
[ is a shell builtin
[ is /usr/bin/[
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ FILE=/etc/hosts
pi@pilabs ~ $ [ -f $FILE -a -r $FILE ] && cat $FILE
127.0.0.1       localhost
::1             localhost ip6-localhost ip6-loopback
fe00::0         ip6-localnet
ff00::0         ip6-mcastprefix
ff02::1         ip6-allnodes
ff02::2         ip6-allrouters

#127.0.1.1      pilabs.theurbanpenguin.com
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ echo "I am using $0 with the options: $-"
I am using -bash with the options: himBH
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ hello8.sh
Hello Anonymous
pi@pilabs ~ $ hello8.sh  fred
Hello fred
pi@pilabs ~ $ cat bin/hello8.sh
#!/bin/bash
name=${1-"Anonymous"}
echo "Hello $name"
exit 0
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ FILE="my file"
pi@pilabs ~ $ [ -f $FILE -a -r $FILE ] && cat $FILE
-bash: [: too many arguments
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ FILE="my file"
pi@pilabs ~ $ [ -f "$FILE" -a -r "$FILE" ] && cat "$FILE"
The File Contents
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ FILE="my.pl"
pi@pilabs ~ $ [[ $FILE =~ \.pl$ ]] && echo "Perl found"
Perl found
pi@pilabs ~ $ FILE="my.apl"
pi@pilabs ~ $ [[ $FILE =~ \.pl$ ]] && echo "Perl found"
pi@pilabs ~ $ _
```

```
#!/bin/bash
# Welcome script to display a message to users on login
# Author: @theurbanpenguin
# Date: 1/1/1971
shopt -s nocasematch #turn off case sensitivity
read -p "Type color or mono for script output: "
if [[ $REPLY =~ colou?r ]] ; then
  source $HOME/snippets/color
fi
#Where parameters are not set the display will be mono
echo -e "${GREEN}This is $0 $RESET"
shopt -u nocasematch #reset case sensitivity
exit 0
```

```
pi@pilabs ~/bin $ COUNT=1
pi@pilabs ~/bin $ (( COUNT++ ))
pi@pilabs ~/bin $ echo $COUNT
2
pi@pilabs ~/bin $ _
```

```
pi@pilabs ~/bin $ COUNT=10
pi@pilabs ~/bin $ (( COUNT-- ))
pi@pilabs ~/bin $ (( COUNT > 1 )) && echo "Count is greater than 1"
Count is greater than 1
pi@pilabs ~/bin $ _
```

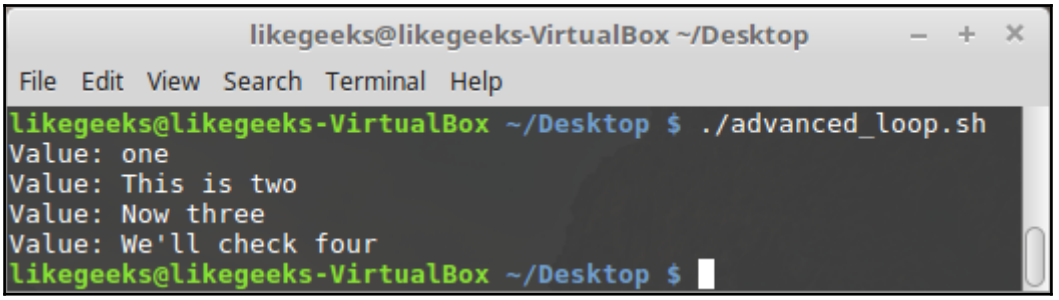
Chapter 6: Iterating with Loops

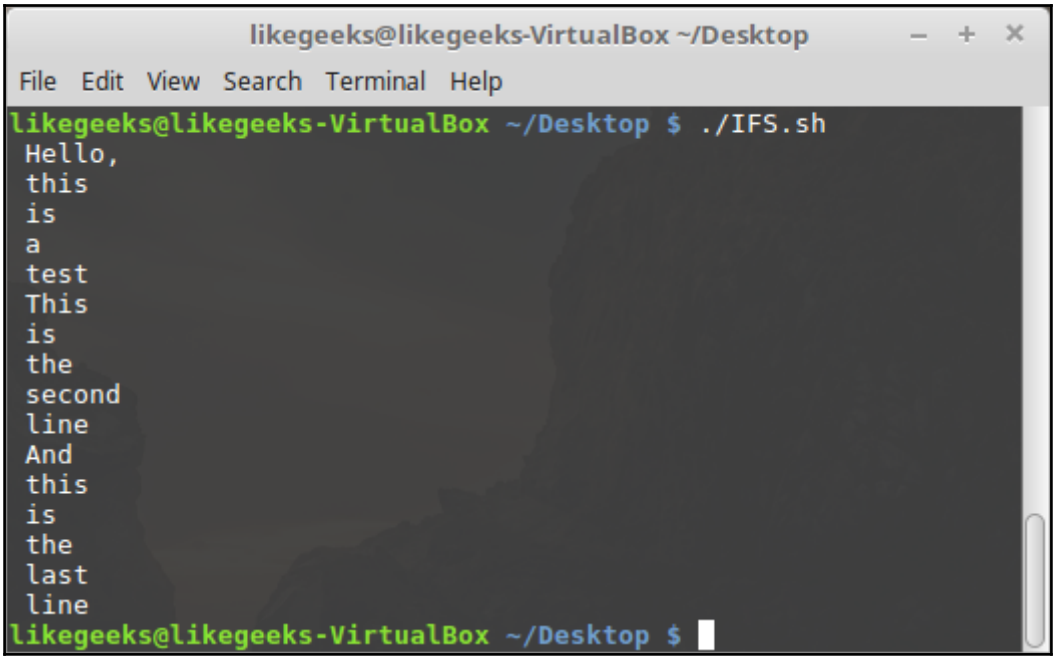
```
pi@pilabs ~ $ sudo -i
[sudo] password for pi:
root@pilabs:~# for u in bob joe ; do
> useradd $u
> echo "$u:Password1" | chpasswd
> passwd -e $u
> done
passwd: password expiry information changed.
passwd: password expiry information changed.
root@pilabs:~#
```

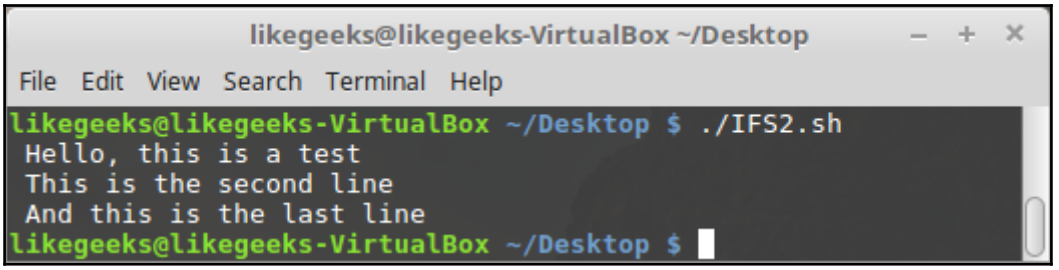
```
pi@pilabs ~/bin $ for f in ba* ; do
> stat "$f"
> done
  File: `backup2.sh'
  Size: 675             Blocks: 8          IO Block: 4096   regular file
Device: b302h/45826d    Inode: 270110      Links: 1
Access: (0755/-rwxr-xr-x)  Uid: ( 1000/      pi)   Gid: ( 1000/      pi)
Access: 2015-07-17 14:00:04.119477594 +0000
Modify: 2015-07-17 14:00:04.119477594 +0000
Change: 2015-07-17 14:00:04.139477463 +0000
 Birth: -
  File: `backup.sh'
  Size: 775             Blocks: 8          IO Block: 4096   regular file
Device: b302h/45826d    Inode: 268466      Links: 1
Access: (0755/-rwxr-xr-x)  Uid: ( 1000/      pi)   Gid: ( 1000/      pi)
Access: 2015-07-04 19:56:11.481438080 +0000
Modify: 2015-07-04 19:56:11.481438080 +0000
Change: 2015-07-04 19:56:11.491438018 +0000
 Birth: -
```

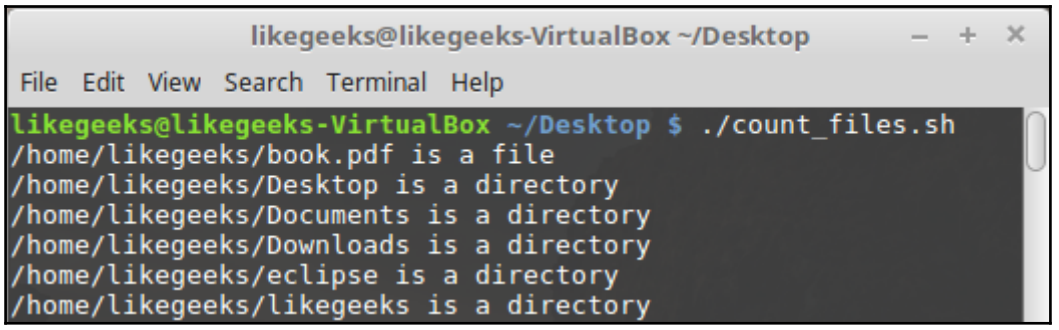
```
pi@pilabs ~/bin $ for user in $(who | cut -f1 -d" ") ; do
> lsof -u "$user" -a -c bash | grep cwd
> done
bash    14935   pi  cwd    DIR  179,2     4096 268409 /home/pi/bin
bash    15140   pi  cwd    DIR  179,2     4096 268409 /home/pi/bin
pi@pilabs ~/bin $
```

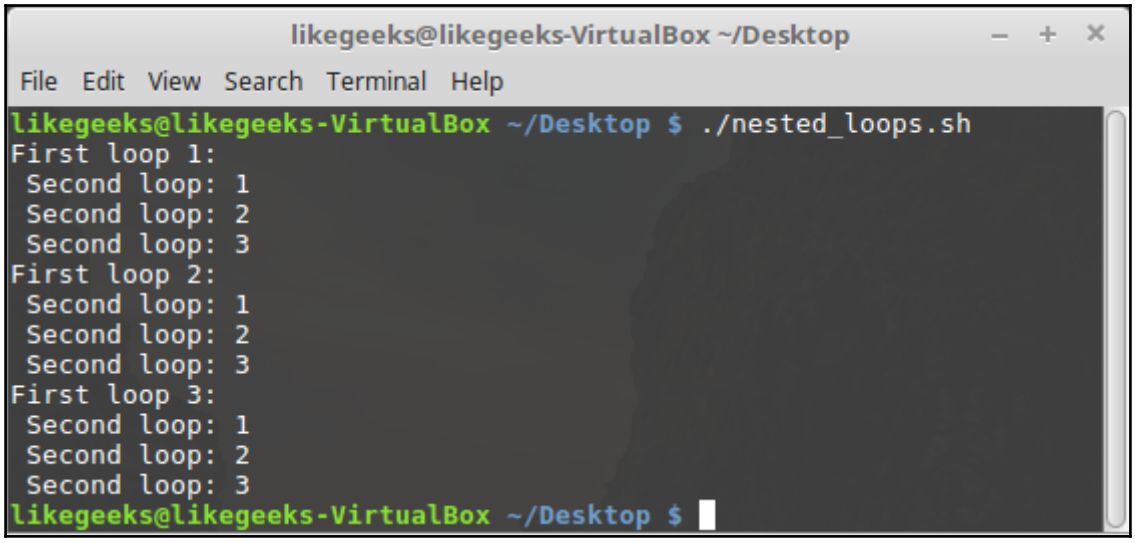
```
pi@pilabs ~/bin $
pi@pilabs ~/bin $ hello9.sh fred bob
You are using hello9.sh
Hello fred
Hello bob
pi@pilabs ~/bin $
```






likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./IFS2.sh
Hello, this is a test
This is the second line
And this is the last line
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./count_files.sh
/home/likegeeks/book.pdf is a file
/home/likegeeks/Desktop is a directory
/home/likegeeks/Documents is a directory
/home/likegeeks/Downloads is a directory
/home/likegeeks/eclipse is a directory
/home/likegeeks/likegeeks is a directory


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./nested_loops.sh
First loop 1:
Second loop: 1
Second loop: 2
Second loop: 3
First loop 2:
Second loop: 1
Second loop: 2
Second loop: 3
First loop 3:
Second loop: 1
Second loop: 2
Second loop: 3
likegeeks@likegeeks-VirtualBox ~/Desktop $

```
pi@pilabs ~ $ for f in * ; do
> [ -d "$f" ] && break
> done
pi@pilabs ~ $ echo "We have found a directory: $f"
We have found a directory: bin
pi@pilabs ~ $
```

```
pi@pilabs ~ $ for f in * ; do [ -d "$f" ] || continue
> dir_list="$dir_list $f"
> done
pi@pilabs ~ $ echo "$dir_list"
 bin python_games snippets
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ COUNT=10
pi@pilabs ~ $ while (( COUNT >= 0 )) ; do
> echo -e "$COUNT \c"
> (( COUNT-- ))
> done ; echo
10 9 8 7 6 5 4 3 2 1 0
pi@pilabs ~ $ _
```

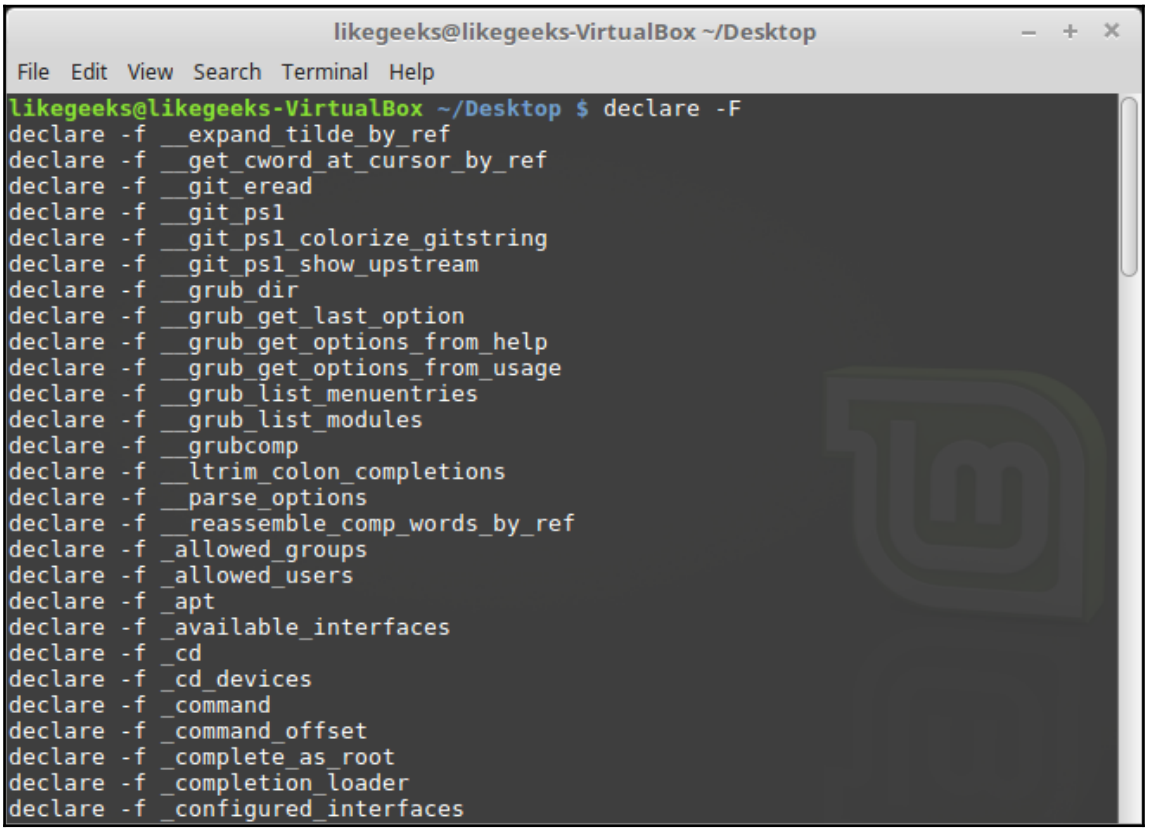
```
pi@pilabs ~ $
pi@pilabs ~ $ cat servers.txt
8.8.8.8
8.8.4.4
pi@pilabs ~ $ while read server ; do
> ping -c1 "$server" && servers_up="$servers_up $servers"
> done < servers.txt
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_req=1 ttl=52 time=25.1 ms

--- 8.8.8.8 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 25.187/25.187/25.187/0.000 ms
PING 8.8.4.4 (8.8.4.4) 56(84) bytes of data.
64 bytes from 8.8.4.4: icmp_req=1 ttl=52 time=24.9 ms

--- 8.8.4.4 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 24.950/24.950/24.950/0.000 ms
pi@pilabs ~ $ echo "These servers are up $servers_up"
These servers are up  8.8.8.8 8.8.4.4
pi@pilabs ~ $ _
```

```
pi@pilabs ~/bin $ ping_server_from_file.sh servers.txt
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_req=1 ttl=52 time=24.5 ms

--- 8.8.8.8 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 24.578/24.578/24.578/0.000 ms
PING 8.8.4.4 (8.8.4.4) 56(84) bytes of data.
64 bytes from 8.8.4.4: icmp_req=1 ttl=52 time=24.5 ms

--- 8.8.4.4 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 24.521/24.521/24.521/0.000 ms
The following servers are up on 29/08/15
Server up: 8.8.8.8
Server up: 8.8.4.4
pi@pilabs ~/bin $ _
```

```
Choose an item: a,b or c
a: Backup
b: Display Calendar
c: Exit
```

```
#!/bin/bash
# Author: @theurbanpenguin
# Web: www.theurbapenguin.com
# Sample menu
# Last Edited: August 2015

while true
do
  clear
  echo "Choose an item: a,b or c"
  echo "a: Backup"
  echo "b: Display Calendar"
  echo "c: Exit"
  read -sn1
  case "$REPLY" in
    a) tar -czvf $HOME/backup.tgz ${HOME}/bin;;
    b) cal;;
    c) exit 0;;
  esac
  read -n1 -p "Press any key to continue"
done
```

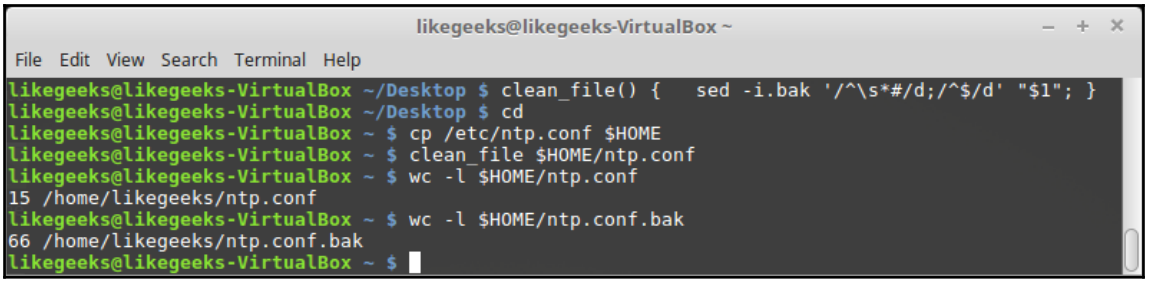
Chapter 7: Creating Building Blocks with Functions



```
pi@pilabs ~ $ type quote
quote is a function
quote ()
{
    local quoted=${1//\'/\'\\\'\'};
    printf "'%s'" "$quoted"
}
```

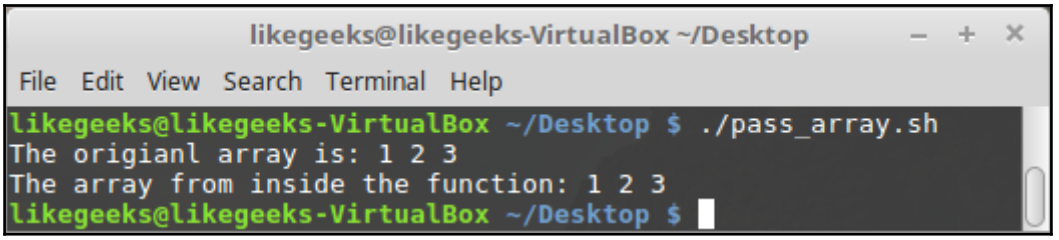
```
'pi'pi@pilabs ~ $ quote $USER
'pi'pi@pilabs ~ $ _
```

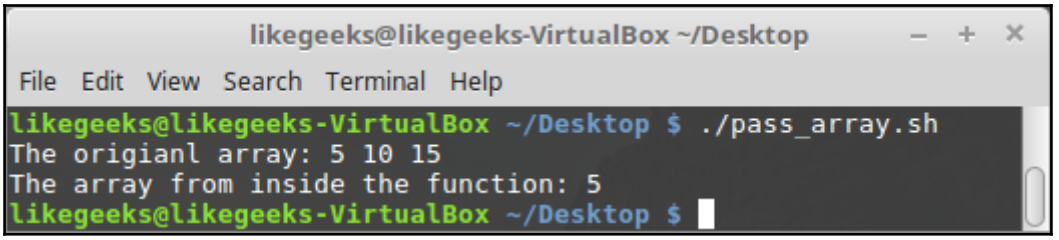
```
pi@pilabs ~ $ type show_system
show_system is a function
show_system ()
{
    echo "The uptime is:";
    uptime;
    echo;
    echo "CPU Detail";
    lscpu;
    echo;
    echo "User list";
    who
}
```

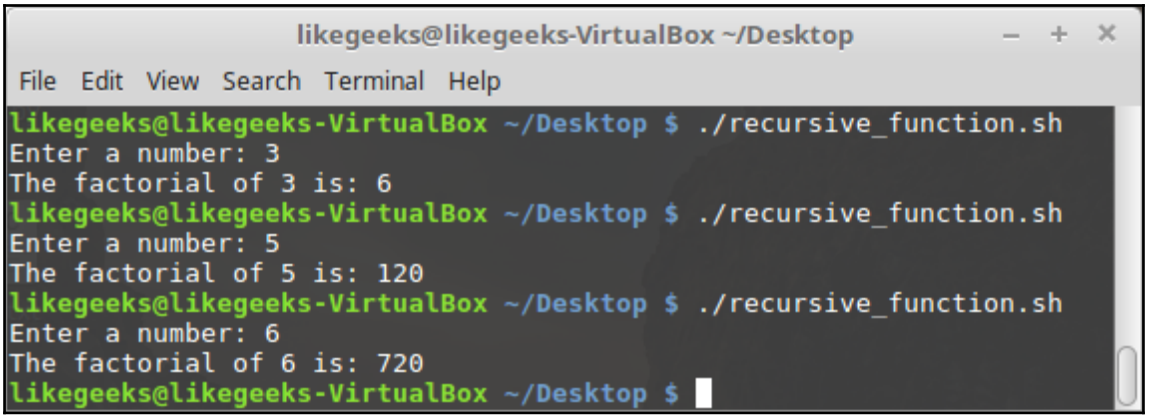


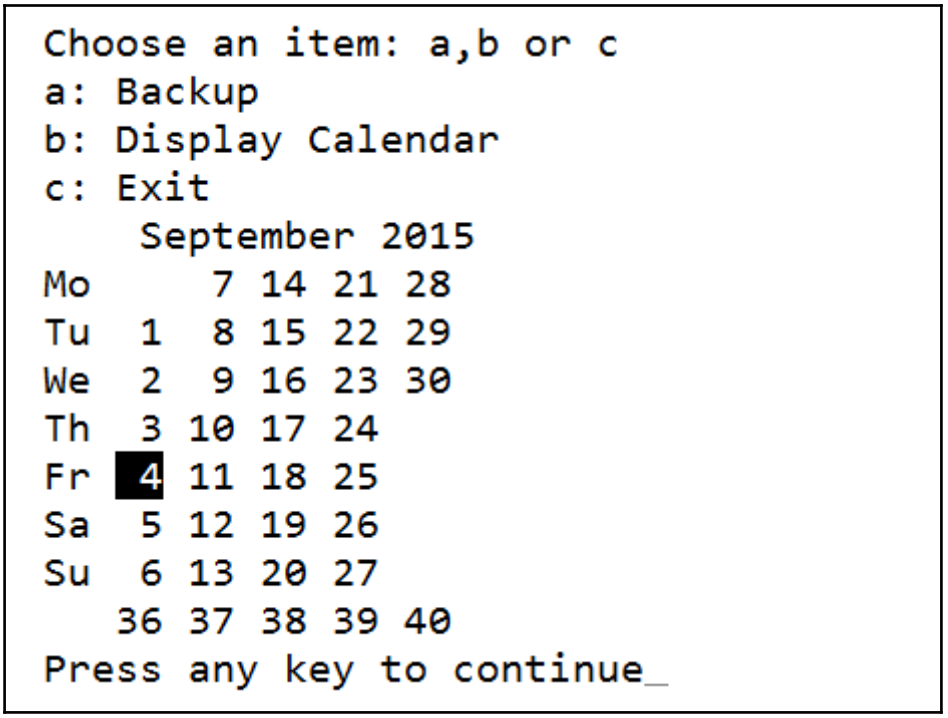

```
pi@pilabs ~ $ clean.sh
Enter a file to clean: ntp.cff
ntp.cff does not seem to be a file
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ clean.sh
Enter a file to clean: ntp.conf
The file ntp.conf starts with 55 ntp.conf
The file ntp.conf is now 13 ntp.conf
pi@pilabs ~ $ _
```




likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./pass_array.sh
The origianl array: 5 10 15
The array from inside the function: 5
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./recursive_function.sh
Enter a number: 3
The factorial of 3 is: 6
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./recursive_function.sh
Enter a number: 5
The factorial of 5 is: 120
likegeeks@likegeeks-VirtualBox ~/Desktop $ ./recursive_function.sh
Enter a number: 6
The factorial of 6 is: 720
likegeeks@likegeeks-VirtualBox ~/Desktop $


Choose an item: a,b or c
a: Backup
b: Display Calendar
c: Exit
September 2015
Mo 7 14 21 28
Tu 1 8 15 22 29
We 2 9 16 23 30
Th 3 10 17 24
Fr 4 11 18 25
Sa 5 12 19 26
Su 6 13 20 27
36 37 38 39 40
Press any key to continue_

Chapter 8: Introducing the Stream Editor

```
pi@pilabs ~ $ ifconfig eth0 | grep "RX packets"
          RX packets:689830 errors:0 dropped:5 overruns:0 frame:0
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ grep "$USER" /etc/passwd
pi:x:1000:1000:,,,:/home/pi:/bin/bash
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ read -p "Enter a user name: "
Enter a user name: pi
pi@pilabs ~ $ if (grep "$REPLY" /etc/passwd > /dev/null ); then
> echo "The user $REPLY exits"
> exit 1
> fi
The user pi exits
exit
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ grep -c name /proc/cpuinfo
4
```

```
[pi@black-pearl ~ ]$ grep -c name /proc/cpuinfo
1
[pi@black-pearl ~ ]$ _
```

```
[pi@black-pearl ~ ]$ bash
[pi@black-pearl ~ ]$ CPU_CORES=$(grep -c name /proc/cpuinfo)
[pi@black-pearl ~ ]$ if (( CPU_CORES < 4 )); then
> echo "A minumum a 4 cores are required"
> exit 1
> fi
A minumum a 4 cores are required
exit
[pi@black-pearl ~ ]$
```

```
[pi@black-pearl ~ ]$ type check_cores
check_cores is a function
check_cores ()
{
    [ -z $1 ] && REQ_CORES=2;
    CPU_CORES=$(grep -c name /proc/cpuinfo);
    if (( CPU_CORES < REQ_CORES )); then
        echo "A minimum a $REQ_CORES cores are required";
        exit 1;
    fi
}
[pi@black-pearl ~ ]$
```

```
[pi@black-pearl ~ ]$ check_cores 1
[pi@black-pearl ~ ]$ check_cores
A minimum a 2 cores are required
exit
[pi@black-pearl ~ ]$ _
```

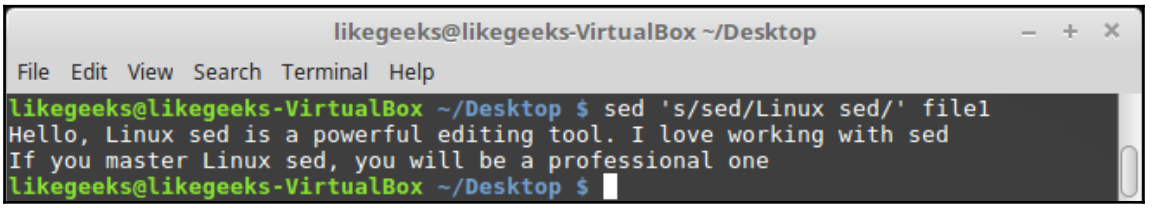
```
#!/bin/bash
OLDIFS="$IFS"
IFS=","
while read product price quantity
do
    echo -e "\033[1;34m$product \
        ========================\033[0m\n\
    Price : \t $price \n\
    Quantity : \t $quantity \n"

done < "$1"
IFS=$OLDIFS
```

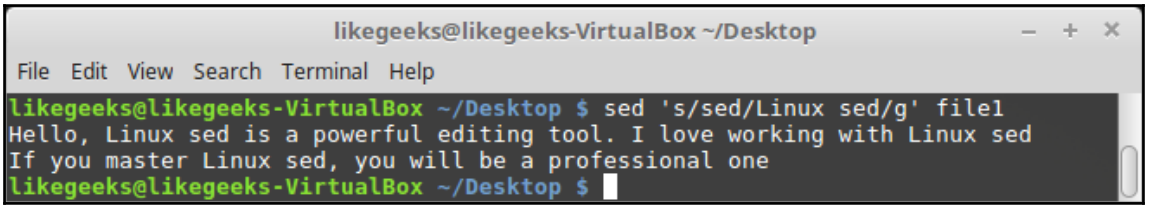
```
pi@pilabs ~/bin $ parsecsv.sh tools
drill          ========================
        Price :          99
        Quantity :       5

hammer          ========================
        Price :          10
        Quantity :       50

brush          ========================
        Price :          5
```

```
pi@pilabs ~/bin $ parsecsv.sh tools  | grep -A2 hammer
hammer          ========================
        Price :          10
        Quantity :       50
pi@pilabs ~/bin $ _
```

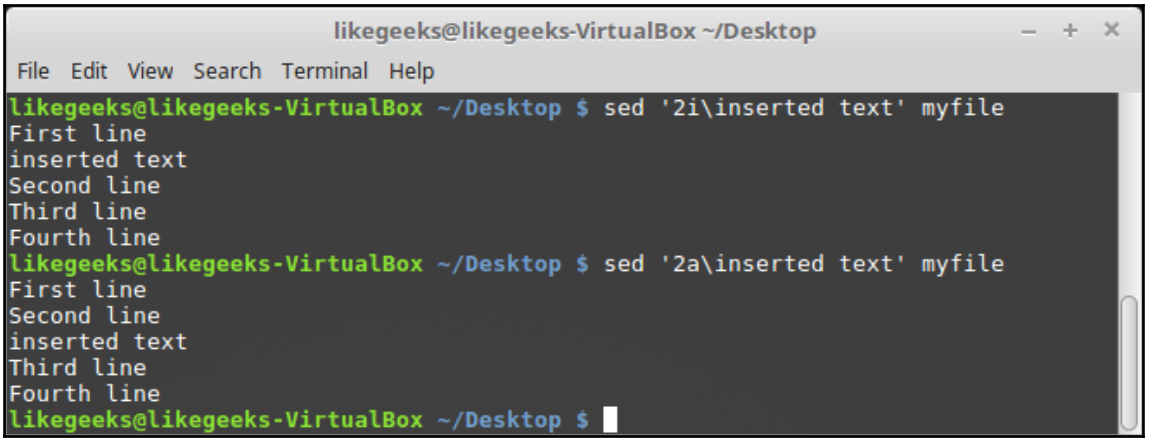
```
pi@pilabs ~ $ sed -n '/^root/ p' /etc/passwd
root:x:0:0:root:/root:/bin/bash
pi@pilabs ~ $ _
```

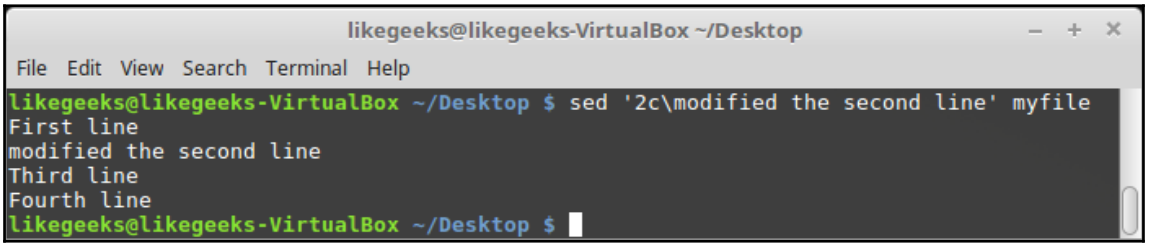
```
pi@pilabs ~ $ sed -n ' /^pi/ s/bash/sh/p ' /etc/passwd
pi:x:1000:1000:,,,:/home/pi:/bin/sh
pi@pilabs ~ $ _
```

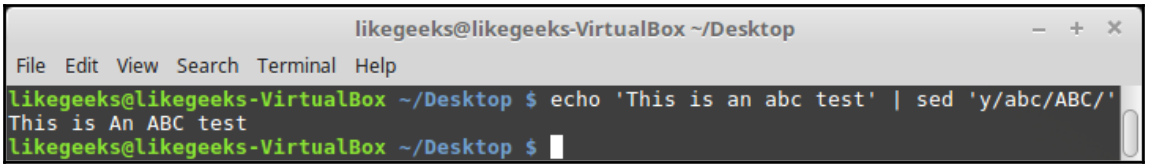


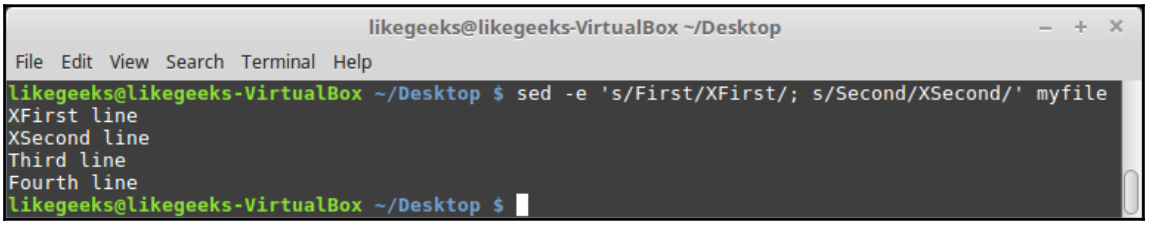



```
pi@pilabs ~ $ sed -i ' /^pi/ s@bash@sh@pg ' "$HOME/passwd"
```


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed '2i\inserted text' myfile
First line
inserted text
Second line
Third line
Fourth line
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed '2a\inserted text' myfile
First line
Second line
inserted text
Third line
Fourth line
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed '2c\modified the second line' myfile
First line
modified the second line
Third line
Fourth line
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo 'This is an abc test' | sed 'y/abc/ABC/'
This is An ABC test
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed -e 's/First/XFirst/; s/Second/XSecond/' myfile
XFirst line
XSecond line
Third line
Fourth line
likegeeks@likegeeks-VirtualBox ~/Desktop $

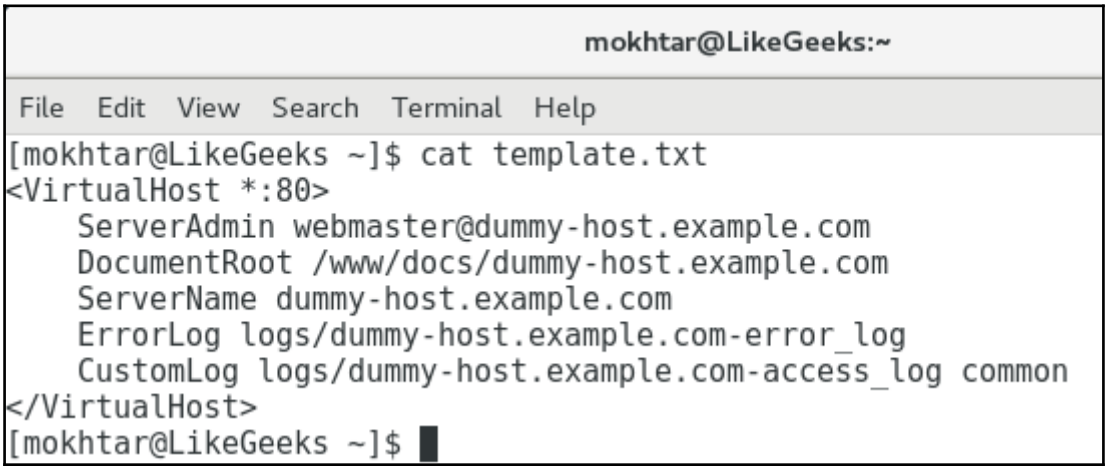
Chapter 9: Automating Apache Virtual Hosts

```
#<VirtualHost *:80>
#    ServerAdmin webmaster@dummy-host.example.com
#    DocumentRoot /www/docs/dummy-host.example.com
#    ServerName dummy-host.example.com
#    ErrorLog logs/dummy-host.example.com-error_log
#    CustomLog logs/dummy-host.example.com-access_log common
#</VirtualHost>
```

```
355  #<VirtualHost *:80>
356  #    ServerAdmin webmaster@dummy-host.example.com
357  #    DocumentRoot /www/docs/dummy-host.example.com
358  #    ServerName dummy-host.example.com
359  #    ErrorLog logs/dummy-host.example.com-error_log
360  #    CustomLog logs/dummy-host.example.com-access_log common
361  #</VirtualHost>
362
```

```
mokhtar@LikeGeeks:~
File  Edit  View  Search  Terminal  Help
[mokhtar@LikeGeeks ~]$ sed -n '355,361 p ' httpd.conf
#<VirtualHost *:80>
#    ServerAdmin webmaster@dummy-host.example.com
#    DocumentRoot /www/docs/dummy-host.example.com
#    ServerName dummy-host.example.com
#    ErrorLog logs/dummy-host.example.com-error_log
#    CustomLog logs/dummy-host.example.com-access_log common
#</VirtualHost>
[mokhtar@LikeGeeks ~]$
```

```
/^#<VirtualHost/,/^#<\/VirtualHost/ {
s/^#//
w template.txt
}
```



```
mokhtar@LikeGeeks:~
File  Edit  View  Search  Terminal  Help
[mokhtar@LikeGeeks ~]$ cat vhost.sh
#!/bin/bash
WEBDIR=/www/docs
CONFDIR=/etc/httpd/conf.d
TEMPLATE=$HOME/template.txt
[ -d $CONFDIR ] || mkdir -p $CONFDIR
sed s/dummy-host.example.com/$1/ $TEMPLATE > $CONFDIR/$1.conf
mkdir -p $WEBDIR/$1
echo "New site for $1" > $WEBDIR/$1/index.html
[mokhtar@LikeGeeks ~]$
```

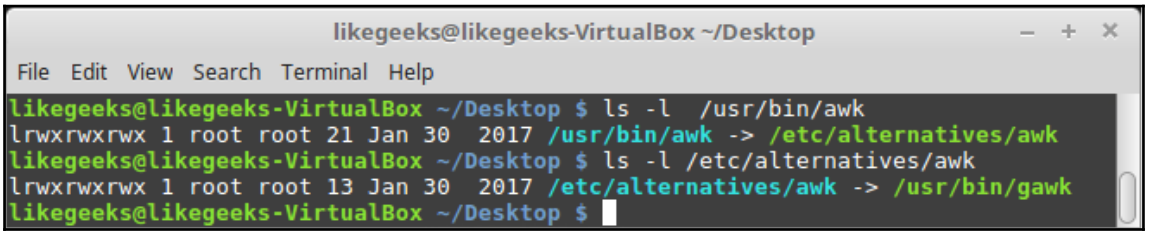
```
mokhtar@LikeGeeks:~
File  Edit  View  Search  Terminal  Help
[mokhtar@LikeGeeks ~]$ cat /etc/httpd/conf.d/sales.example.com.conf
<VirtualHost *:80>
    ServerAdmin webmaster@sales.example.com
    DocumentRoot /www/docs/sales.example.com
    ServerName sales.example.com
    ErrorLog logs/sales.example.com-error_log
    CustomLog logs/sales.example.com-access_log common
</VirtualHost>
[mokhtar@LikeGeeks ~]$
```

```
[root@apache bin]# ./vhost2.sh marketing.example.com
Do you want to restrict access to this site? y/n y
Which network should we restrict access to: 192.168.0.0/24
[root@apache bin]#
```

```
[root@apache bin]# cat /etc/httpd/conf.d/marketing.example.com.conf
<VirtualHost *:80>
    ServerAdmin webmaster@marketing.example.com
    DocumentRoot /www/docs/marketing.example.com
    ServerName marketing.example.com
    ErrorLog logs/marketing.example.com-error_log
    CustomLog logs/marketing.example.com-access_log common
<Directory /www/docs/marketing.example.com >
  Order allow,deny
  Allow from 127.0.0.1
  Allow from 192.168.0.0/24
</Directory>
</VirtualHost>
```

```
[root@apache bin]# cat vhost2.sh
#!/bin/bash
WEBDIR=/www/docs/$1
CONFDIR=/etc/httpd/conf.d
CONFFILE=$CONFDIR/$1.conf
TEMPLATE=$HOME/template.txt
[ -d $CONFDIR ] || mkdir -p $CONFDIR
sed s/dummy-host.example.com/$1/ $TEMPLATE > $CONFFILE
mkdir -p $WEBDIR
echo "New site for $1" > $WEBDIR/index.html
read -p "Do you want to restrict access to this site? y/n "
[ $REPLY = 'n' ] && exit 0
read -p "Which network should we restrict access to: " NETWORK
sed -i "/<\/VirtualHost>/i <Directory $WEBDIR >\
  \n  Order allow,deny\
  \n  Allow from 127.0.0.1\
  \n  Allow from $NETWORK\
\n</Directory>" $CONFFILE
```

Chapter 10: AWK Fundamentals




```
pi@pilabs ~ $ awk ' BEGIN { print "Hello World!" } '
Hello World!
pi@pilabs ~ $ _
```

```
pi@pilabs ~ $ awk ' BEGIN { FS=":" }
{ print NR,$1 }
END { print "Total:",NR } ' /etc/passwd
1 root
2 daemon
3 bin
4 sys
5 sync
```

```
pi@pilabs ~ $ awk ' END { print NR } ' /etc/passwd
28
pi@pilabs ~ $ wc -l /etc/passwd
28 /etc/passwd
```

```
pi@pilabs ~ $ awk '/bash$/ ' /etc/passwd
root:x:0:0:root:/root:/bin/bash
pi:x:1000:1000:,,,:/home/pi:/bin/bash
bob:x:1001:1004::/home/bob:/bin/bash
joe:x:1002:1005::/home/joe:/bin/bash
pi@pilabs ~ $ _
```

likegeeks@likegeeks-VirtualBox ~/Desktop

File Edit View Search Terminal Help

```
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk 'BEGIN{FS="\n"; RS=""} {print $1,$3}' myfile
John Doe (123) 455-3584
Mokhtar Ebrahim (456) 352-3541
likegeeks@likegeeks-VirtualBox ~/Desktop $
```

likegeeks@likegeeks-VirtualBox ~/Desktop

File Edit View Search Terminal Help

```
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk 'BEGIN{FS="\n"; RS=""; OFS="*"} {print $1,$3}' myfile
John Doe*(123) 455-3584
Mokhtar Ebrahim*(456) 352-3541
likegeeks@likegeeks-VirtualBox ~/Desktop $
```

likegeeks@likegeeks-VirtualBox ~/Desktop

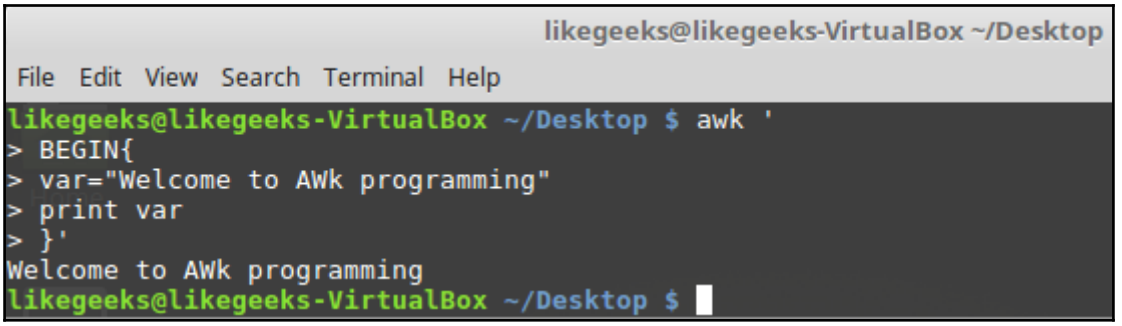
File Edit View Search Terminal Help

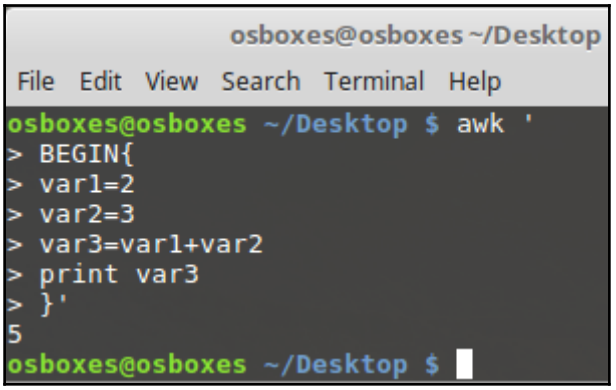
```
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk 'BEGIN{FS=","}{print $1,"FNR="FNR}' myfile myfile
Welcome to AWK programming FNR=1
This is a test line FNR=2
And this is one more FNR=3
Welcome to AWK programming FNR=1
This is a test line FNR=2
And this is one more FNR=3
likegeeks@likegeeks-VirtualBox ~/Desktop $
```

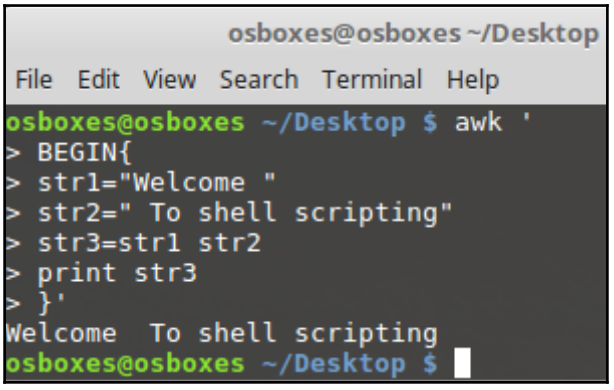
likegeeks@likegeeks-VirtualBox ~/Desktop

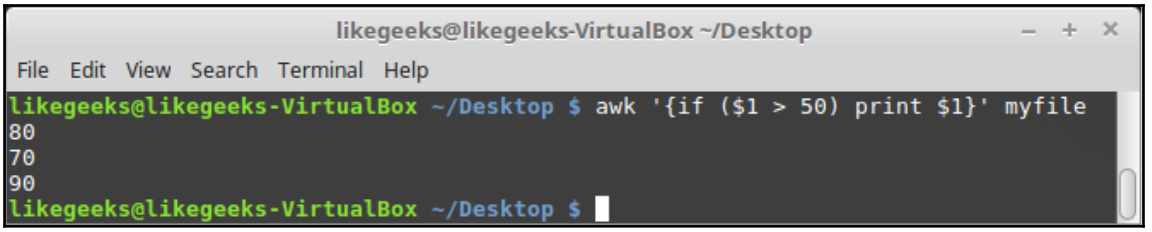
File Edit View Search Terminal Help

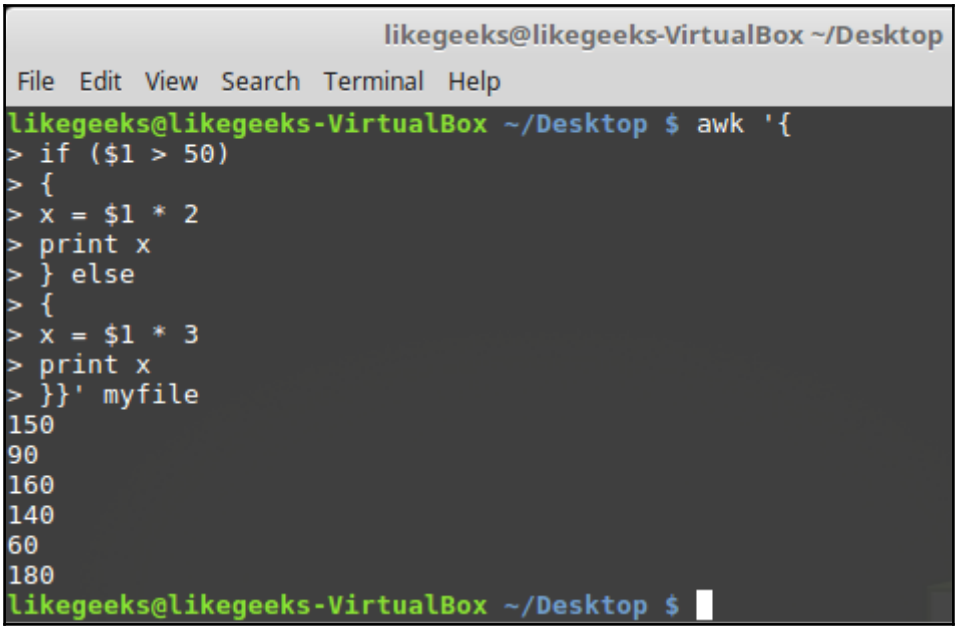
```
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk 'BEGIN {FS=","} {print $1,"FNR="FNR,"NR="NR} END{prin
t "Total lines: ",NR}' myfile myfile
Welcome to AWK programming FNR=1 NR=1
This is a test line FNR=2 NR=2
And this is one more FNR=3 NR=3
Welcome to AWK programming FNR=1 NR=4
This is a test line FNR=2 NR=5
And this is one more FNR=3 NR=6
Total lines:  6
likegeeks@likegeeks-VirtualBox ~/Desktop $
```

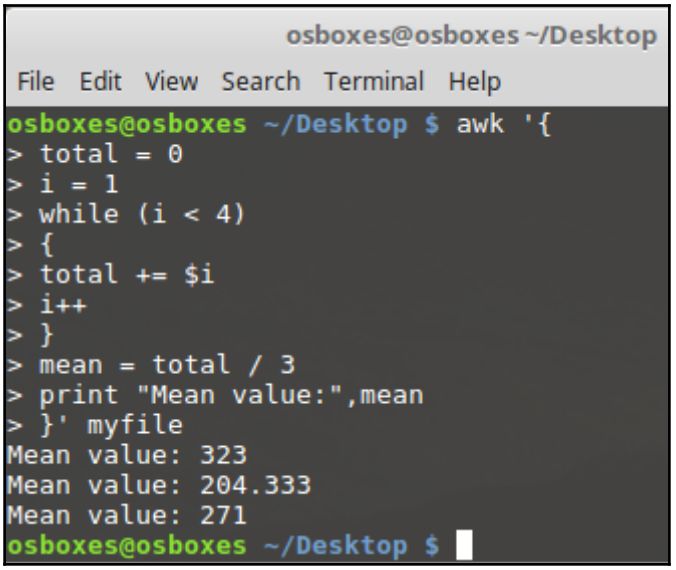

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '
> BEGIN{
> var="Welcome to AWk programming"
> print var
> }'
Welcome to AWk programming
likegeeks@likegeeks-VirtualBox ~/Desktop $

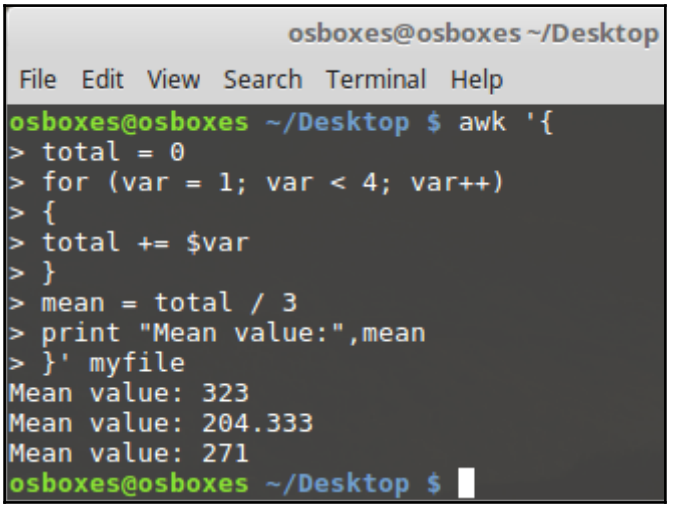

osboxes@osboxes ~/Desktop
File Edit View Search Terminal Help
osboxes@osboxes ~/Desktop $ awk '
> BEGIN{
> var1=2
> var2=3
> var3=var1+var2
> print var3
> }'
5
osboxes@osboxes ~/Desktop $


osboxes@osboxes ~/Desktop
File Edit View Search Terminal Help
osboxes@osboxes ~/Desktop $ awk '
> BEGIN{
> str1="Welcome "
> str2=" To shell scripting"
> str3=str1 str2
> print str3
> }'
Welcome To shell scripting
osboxes@osboxes ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '{if ($1 > 50) print $1}' myfile
80
70
90
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '{
> if ($1 > 50)
> {
> x = $1 * 2
> print x
> } else
> {
> x = $1 * 3
> print x
> }}' myfile
150
90
160
140
60
180
likegeeks@likegeeks-VirtualBox ~/Desktop $





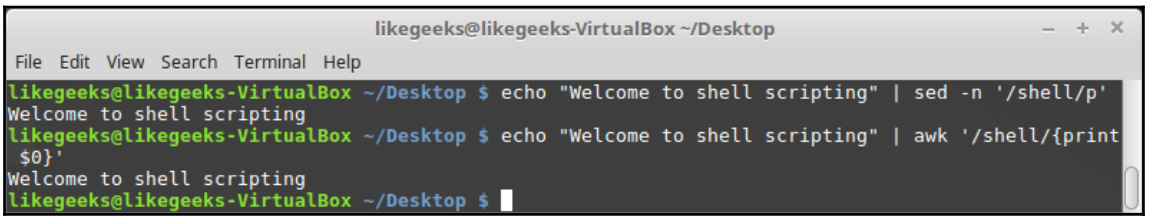

```
pi@pilabs ~ $ awk ' BEGIN { FS=":" } { print $1,$3,$7 } ' /etc/passwd
root 0 /bin/bash
daemon 1 /bin/sh
bin 2 /bin/sh
sys 3 /bin/sh
sync 4 /bin/sync
```

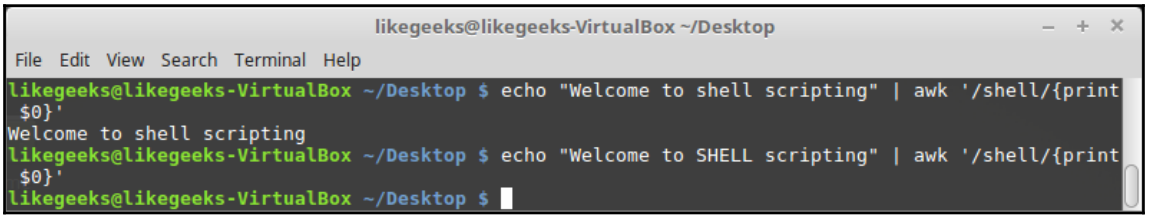
```
pi@pilabs ~ $ awk ' BEGIN { FS=":" }
{ printf "%10s %4d %17s\n",$1,$3,$7 } ' /etc/passwd
      root    0          /bin/bash
    daemon    1            /bin/sh
       bin    2            /bin/sh
       sys    3            /bin/sh
      sync    4          /bin/sync
     games    5            /bin/sh
       man    6            /bin/sh
```

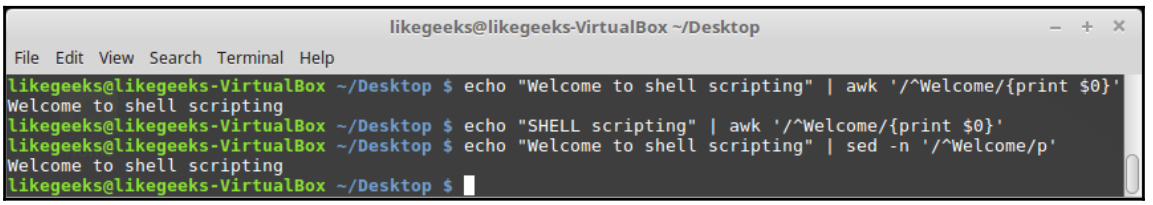
```
pi@pilabs ~ $ awk 'BEGIN {FS=":";printf "%10s %4s %17s\n","Name","UID","Shell" }

{ printf "%10s %4d %17s\n",$1,$3,$7 } ' /etc/passwd
      Name  UID             Shell
      root    0         /bin/bash
    daemon    1           /bin/sh
       bin    2           /bin/sh
       sys    3           /bin/sh
```

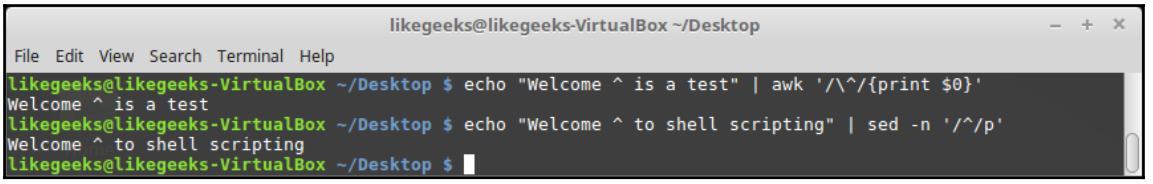
```
pi@pilabs ~ $ awk 'function green(s) {
printf "\033[1;32m" s "\033[0m\n"
}
BEGIN {FS=":";
green("    Name:    UID:    Shell:") }
{ printf "%10s %4d %17s\n",$1,$3,$7 } ' /etc/passwd
    Name:    UID:    Shell:
      root    0          /bin/bash
    daemon    1            /bin/sh
       bin    2            /bin/sh
       sys    3            /bin/sh
```

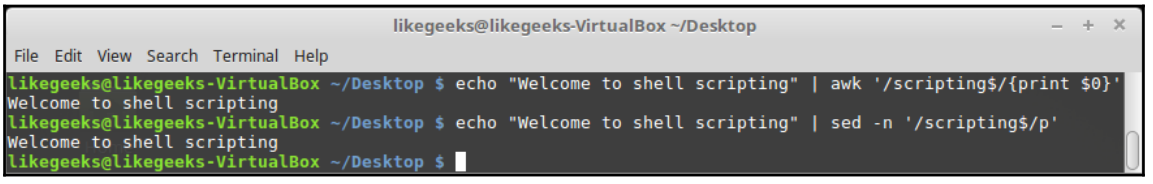
Chapter 11: Regular Expressions

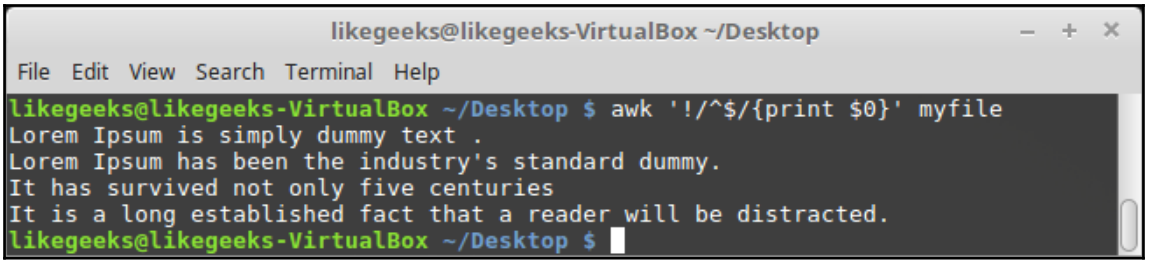


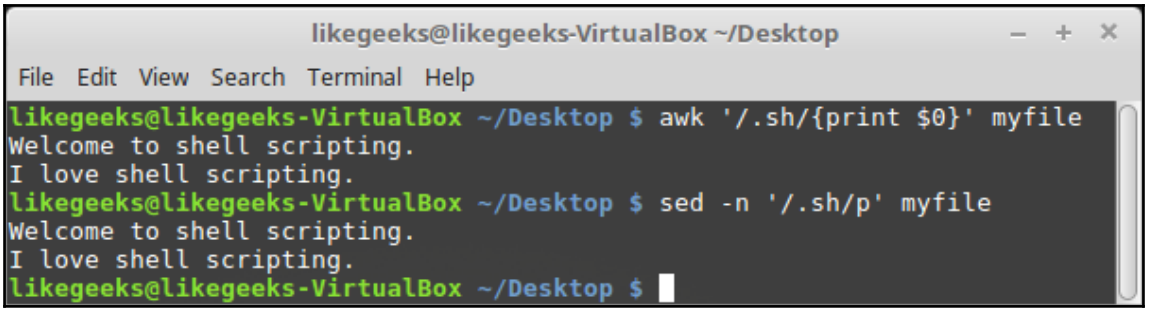


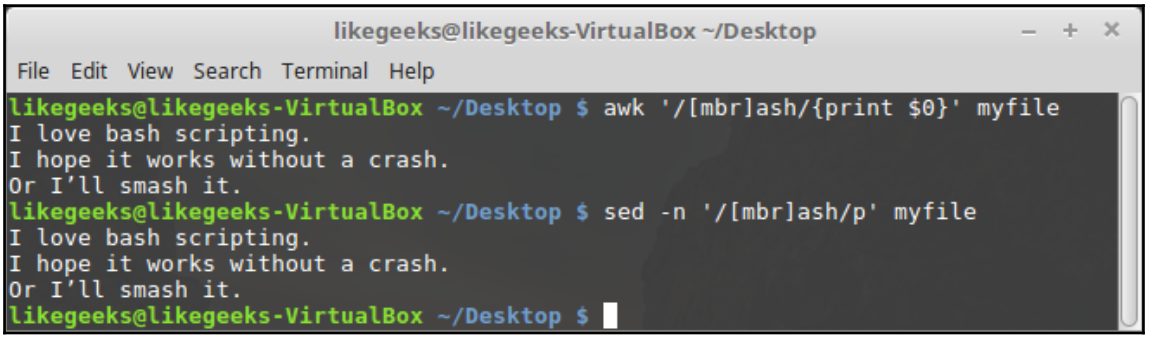


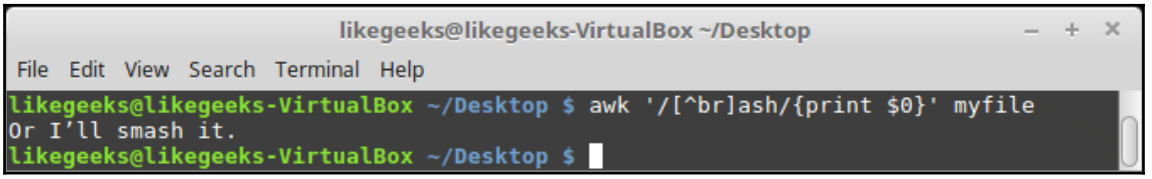


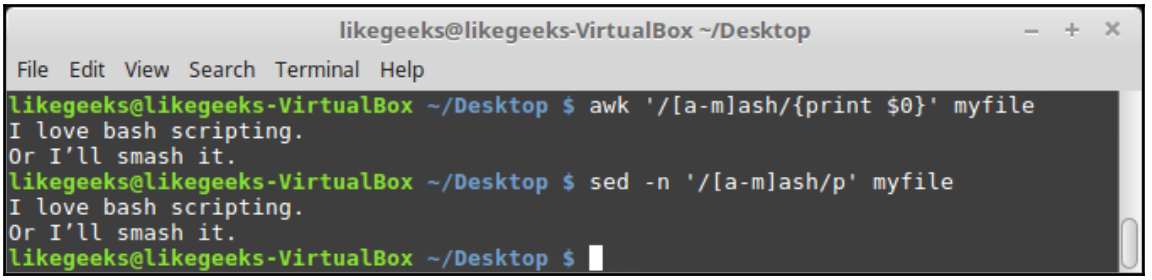


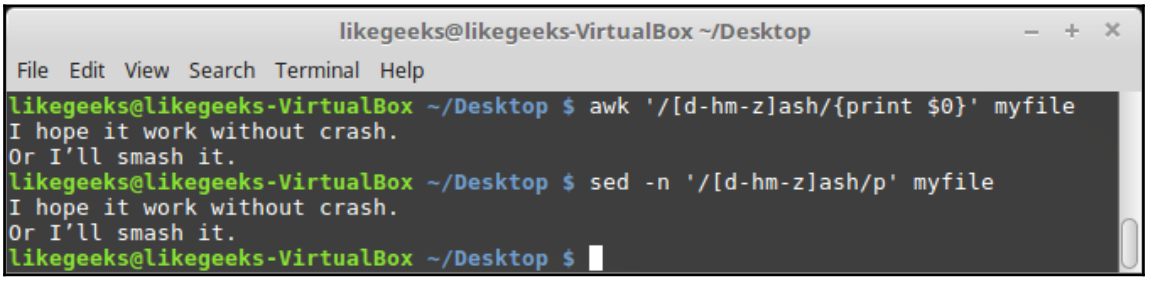

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '!/^$/{print $0}' myfile
Lorem Ipsum is simply dummy text .
Lorem Ipsum has been the industry's standard dummy.
It has survived not only five centuries
It is a long established fact that a reader will be distracted.
likegeeks@likegeeks-VirtualBox ~/Desktop $

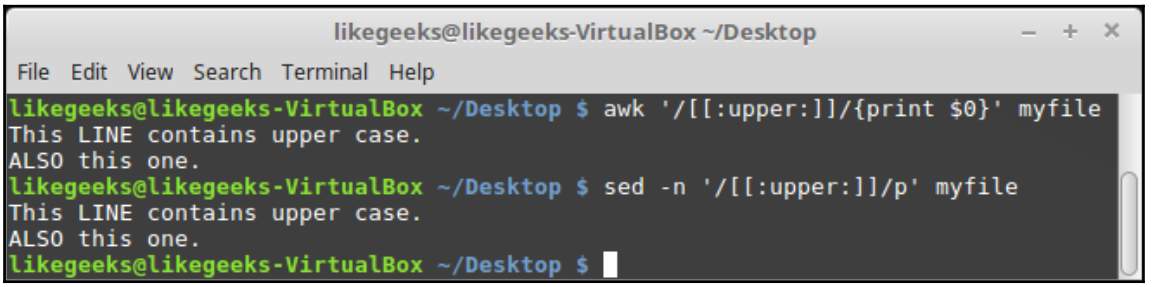

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '/.sh/{print $0}' myfile
Welcome to shell scripting.
I love shell scripting.
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed -n '/.sh/p' myfile
Welcome to shell scripting.
I love shell scripting.
likegeeks@likegeeks-VirtualBox ~/Desktop $

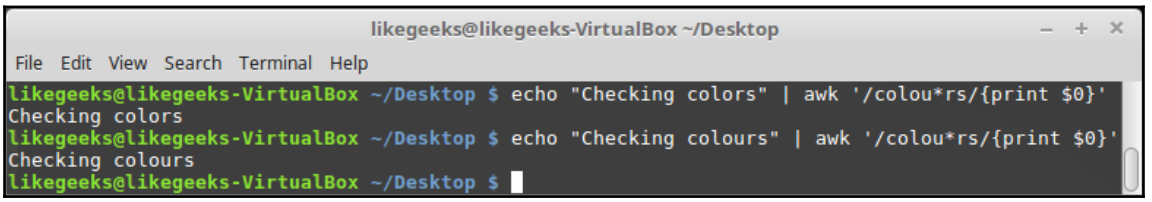

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '/[mbr]ash/{print $0}' myfile
I love bash scripting.
I hope it works without a crash.
Or I'll smash it.
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed -n '/[mbr]ash/p' myfile
I love bash scripting.
I hope it works without a crash.
Or I'll smash it.
likegeeks@likegeeks-VirtualBox ~/Desktop $

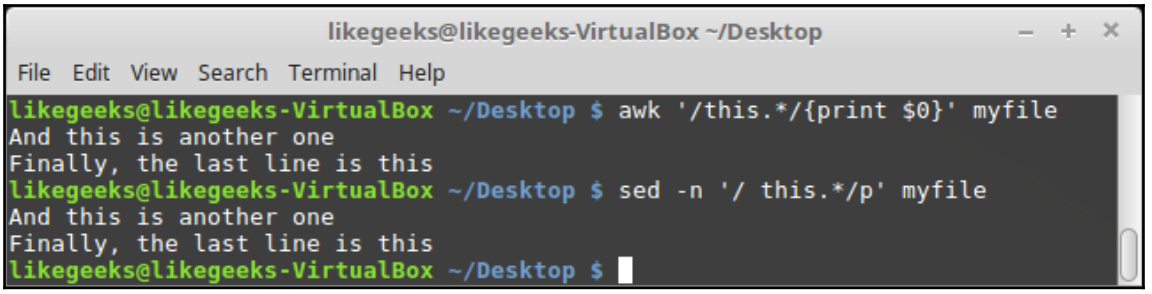

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '/[^br]ash/{print $0}' myfile
Or I'll smash it.
likegeeks@likegeeks-VirtualBox ~/Desktop $

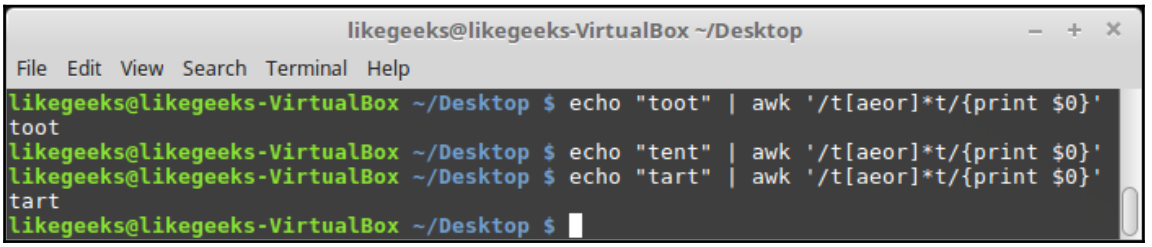

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '/[a-m]ash/{print $0}' myfile
I love bash scripting.
Or I'll smash it.
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed -n '/[a-m]ash/p' myfile
I love bash scripting.
Or I'll smash it.
likegeeks@likegeeks-VirtualBox ~/Desktop $

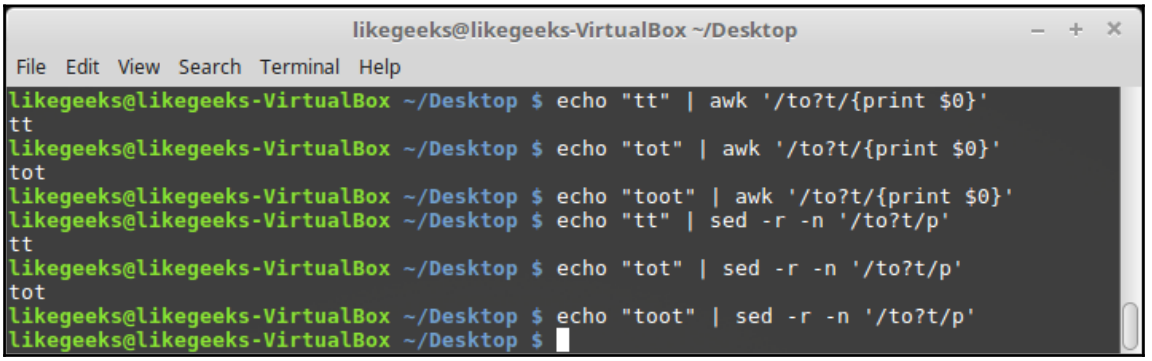

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '/[d-hm-z]ash/{print $0}' myfile
I hope it work without crash.
Or I'll smash it.
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed -n '/[d-hm-z]ash/p' myfile
I hope it work without crash.
Or I'll smash it.
likegeeks@likegeeks-VirtualBox ~/Desktop $

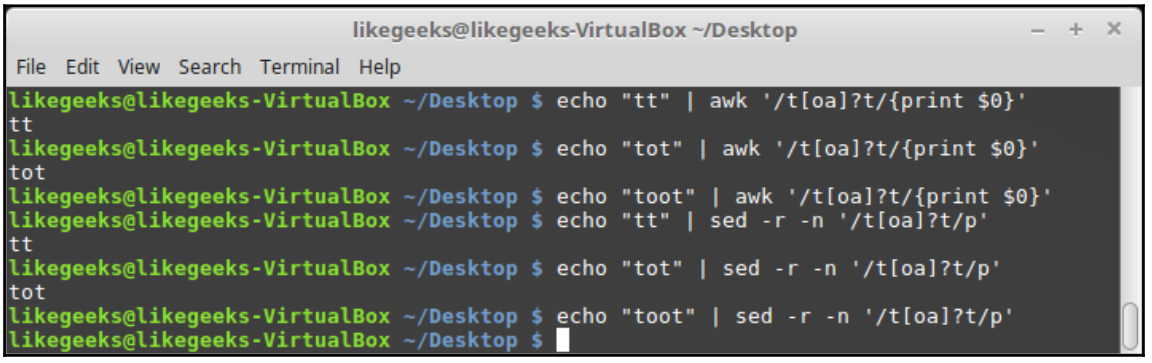

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '/[[:upper:]]/{print $0}' myfile
This LINE contains upper case.
ALSO this one.
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed -n '/[[:upper:]]/p' myfile
This LINE contains upper case.
ALSO this one.
likegeeks@likegeeks-VirtualBox ~/Desktop $

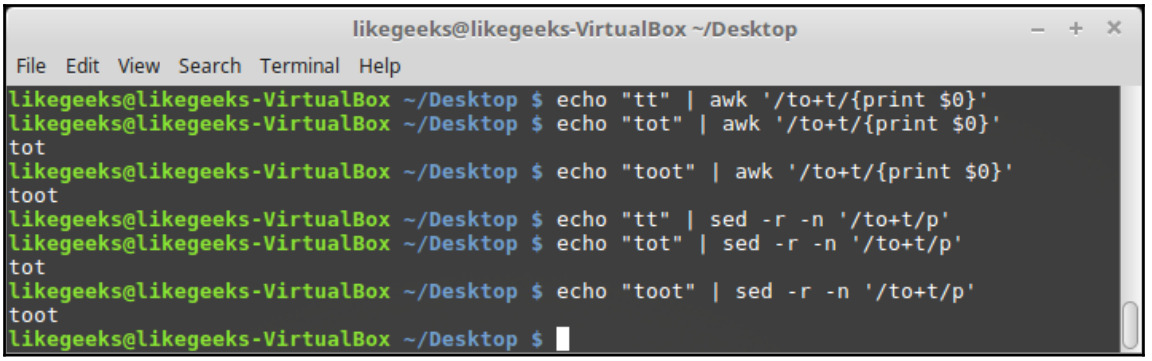

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "Checking colors" | awk '/colou*rs/{print $0}'
Checking colors
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "Checking colours" | awk '/colou*rs/{print $0}'
Checking colours
likegeeks@likegeeks-VirtualBox ~/Desktop $

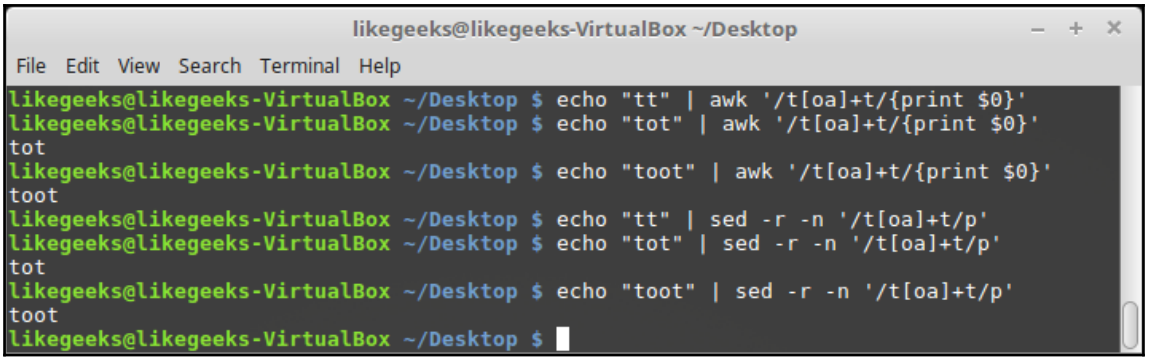

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ awk '/this.*/{print $0}' myfile
And this is another one
Finally, the last line is this
likegeeks@likegeeks-VirtualBox ~/Desktop $ sed -n '/ this.*/p' myfile
And this is another one
Finally, the last line is this
likegeeks@likegeeks-VirtualBox ~/Desktop $

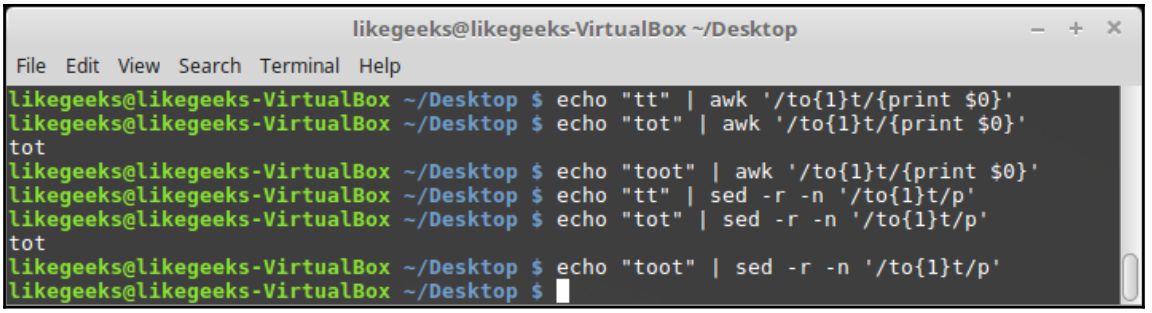

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | awk '/t[aeor]*t/{print $0}'
toot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tent" | awk '/t[aeor]*t/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tart" | awk '/t[aeor]*t/{print $0}'
tart
likegeeks@likegeeks-VirtualBox ~/Desktop $

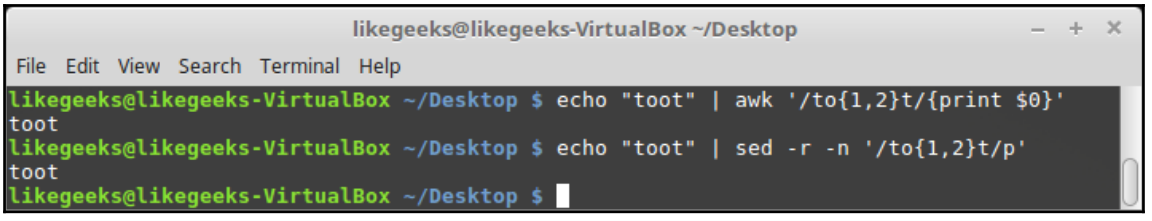

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | awk '/to?t/{print $0}'
tt
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | awk '/to?t/{print $0}'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | awk '/to?t/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | sed -r -n '/to?t/p'
tt
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | sed -r -n '/to?t/p'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | sed -r -n '/to?t/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $

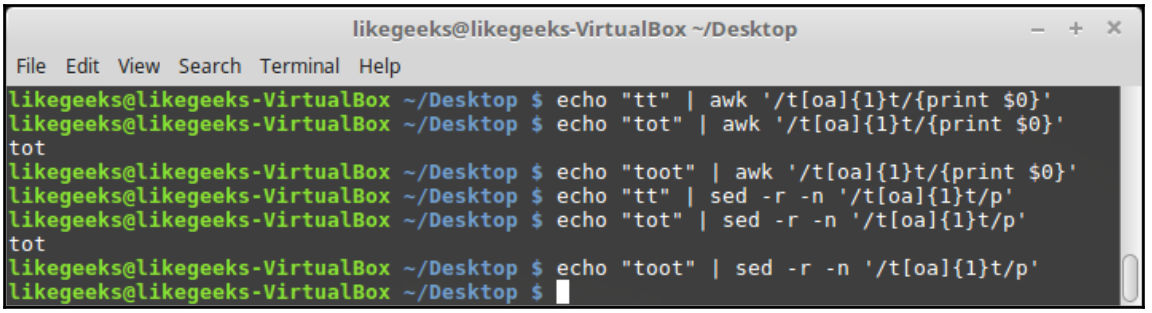

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | awk '/t[oa]?t/{print $0}'
tt
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | awk '/t[oa]?t/{print $0}'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | awk '/t[oa]?t/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | sed -r -n '/t[oa]?t/p'
tt
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | sed -r -n '/t[oa]?t/p'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | sed -r -n '/t[oa]?t/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $

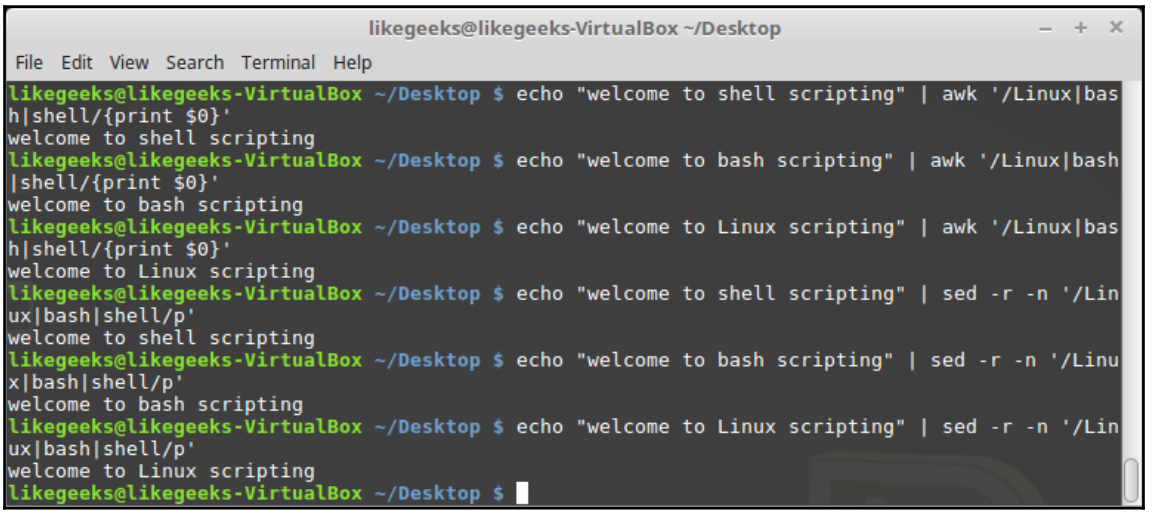

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | awk '/to+t/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | awk '/to+t/{print $0}'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | awk '/to+t/{print $0}'
toot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | sed -r -n '/to+t/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | sed -r -n '/to+t/p'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | sed -r -n '/to+t/p'
toot
likegeeks@likegeeks-VirtualBox ~/Desktop $

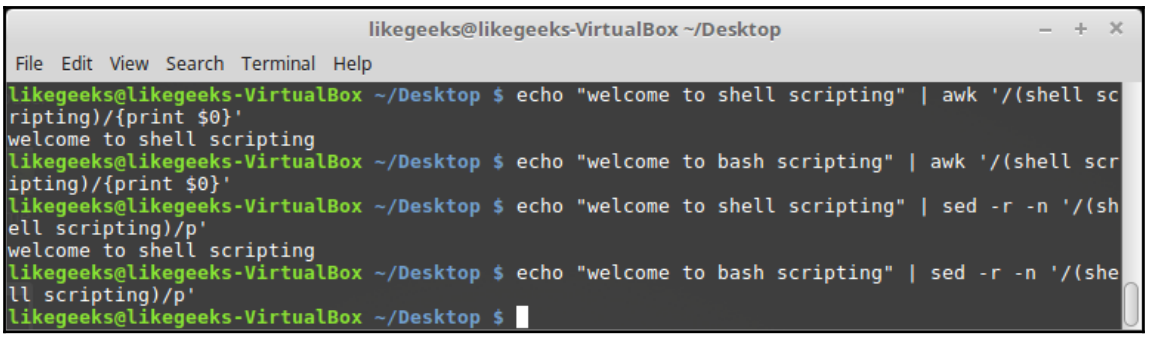

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | awk '/t[oa]+t/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | awk '/t[oa]+t/{print $0}'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | awk '/t[oa]+t/{print $0}'
toot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | sed -r -n '/t[oa]+t/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | sed -r -n '/t[oa]+t/p'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | sed -r -n '/t[oa]+t/p'
toot
likegeeks@likegeeks-VirtualBox ~/Desktop $

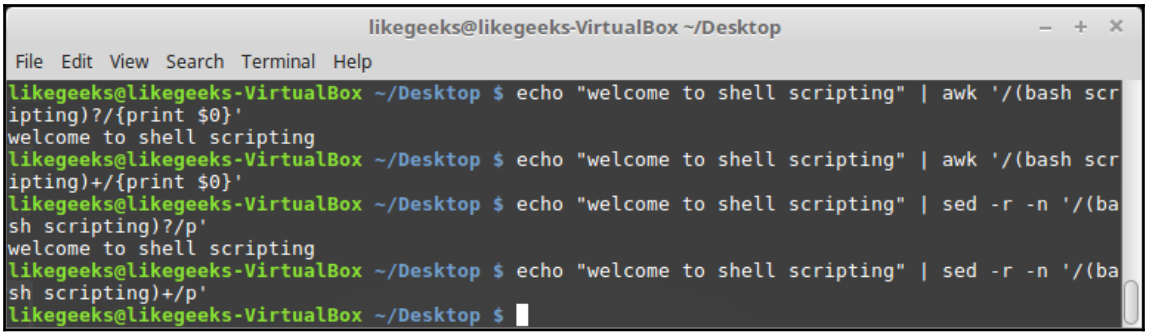

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | awk '/to{1}t/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | awk '/to{1}t/{print $0}'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | awk '/to{1}t/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | sed -r -n '/to{1}t/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | sed -r -n '/to{1}t/p'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | sed -r -n '/to{1}t/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $

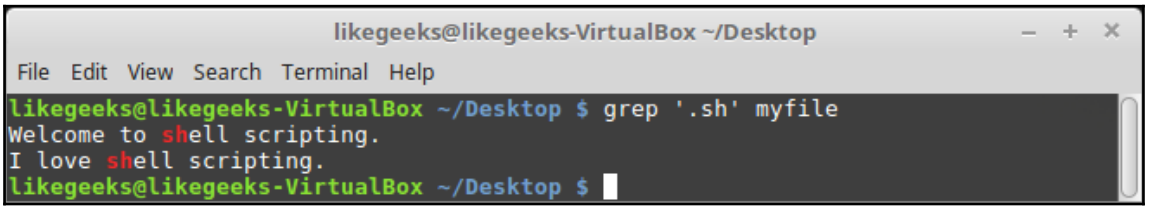

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | awk '/to{1,2}t/{print $0}'
toot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | sed -r -n '/to{1,2}t/p'
toot
likegeeks@likegeeks-VirtualBox ~/Desktop $

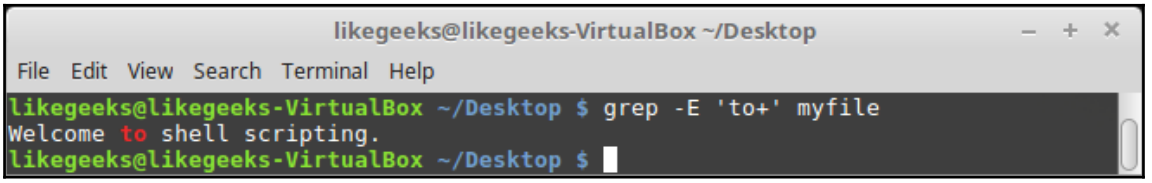

likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | awk '/t[oa]{1}t/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | awk '/t[oa]{1}t/{print $0}'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | awk '/t[oa]{1}t/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tt" | sed -r -n '/t[oa]{1}t/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "tot" | sed -r -n '/t[oa]{1}t/p'
tot
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "toot" | sed -r -n '/t[oa]{1}t/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to shell scripting" | awk '/Linux|bash|shell/{print $0}'
welcome to shell scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to bash scripting" | awk '/Linux|bash|shell/{print $0}'
welcome to bash scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to Linux scripting" | awk '/Linux|bash|shell/{print $0}'
welcome to Linux scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to shell scripting" | sed -r -n '/Linux|bash|shell/p'
welcome to shell scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to bash scripting" | sed -r -n '/Linux|bash|shell/p'
welcome to bash scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to Linux scripting" | sed -r -n '/Linux|bash|shell/p'
welcome to Linux scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to shell scripting" | awk '/(shell scripting)/{print $0}'
welcome to shell scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to bash scripting" | awk '/(shell scripting)/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to shell scripting" | sed -r -n '/(shell scripting)/p'
welcome to shell scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to bash scripting" | sed -r -n '/(shell scripting)/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to shell scripting" | awk '/(bash scr
ipting)?/{print $0}'
welcome to shell scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to shell scripting" | awk '/(bash scr
ipting)+/{print $0}'
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to shell scripting" | sed -r -n '/(ba
sh scripting)?/p'
welcome to shell scripting
likegeeks@likegeeks-VirtualBox ~/Desktop $ echo "welcome to shell scripting" | sed -r -n '/(ba
sh scripting)+/p'
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ grep '.sh' myfile
Welcome to shell scripting.
I love shell scripting.
likegeeks@likegeeks-VirtualBox ~/Desktop $


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks-VirtualBox ~/Desktop $ grep -E 'to+' myfile
Welcome to shell scripting.
likegeeks@likegeeks-VirtualBox ~/Desktop $

Chapter 12: Summarizing Logs with AWK

```
root@andrew-15-10:~# tail /var/log/apache2/access.log
127.0.0.1 - - [12/Oct/2015:09:48:42 +0100] "GET / HTTP/1.1" 200 3525 "-" "Mozilla/5.0 (X11; Ubuntu; L
inux x86_64; rv:41.0) Gecko/20100101 Firefox/41.0"
127.0.0.1 - - [12/Oct/2015:09:48:43 +0100] "GET /icons/ubuntu-logo.png HTTP/1.1" 200 3689 "http://loc
alhost/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:41.0) Gecko/20100101 Firefox/41.0"
127.0.0.1 - - [12/Oct/2015:09:48:43 +0100] "GET /favicon.ico HTTP/1.1" 404 500 "-" "Mozilla/5.0 (X11;
 Ubuntu; Linux x86_64; rv:41.0) Gecko/20100101 Firefox/41.0"
127.0.0.1 - - [12/Oct/2015:09:48:43 +0100] "GET /favicon.ico HTTP/1.1" 404 500 "-" "Mozilla/5.0 (X11;
 Ubuntu; Linux x86_64; rv:41.0) Gecko/20100101 Firefox/41.0"
```

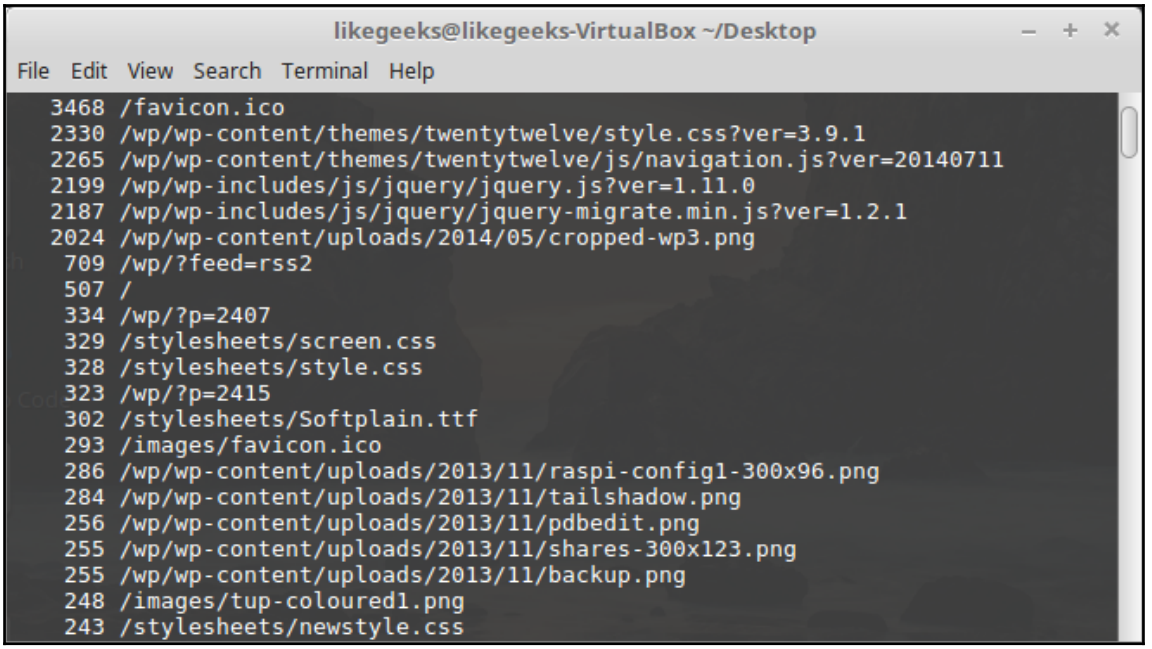
```
root@andrew-15-10:~# awk ' { print $4, $5 } ' /var/log/apache2/access.log
[12/Oct/2015:09:48:42 +0100]
[12/Oct/2015:09:48:43 +0100]
[12/Oct/2015:09:48:43 +0100]
[12/Oct/2015:09:48:43 +0100]
```

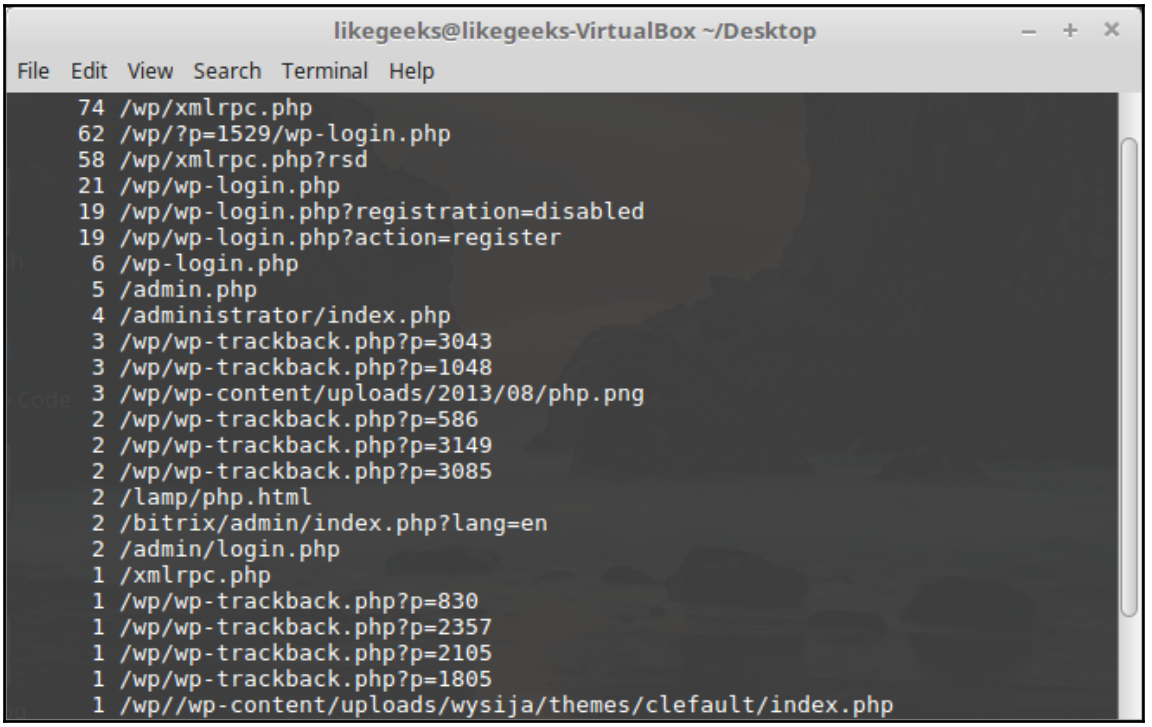
```
pi@pilabs ~/bin $ awk '( $4 ~ /10\/Sep\/2014/ )' access.log  | less
128.252.139.84 - - [10/Sep/2014:00:00:03 +0100] "GET /wp/?cat=281 HTTP/1.1" 200
51860 "http://theurbanpenguin.com/wp/?cat=281" "Mozilla/5.0 (Macintosh; Intel M
c OS X 10_8_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/36.0.1985.125 Safa
i/537.36"
41.150.168.184 - - [10/Sep/2014:00:00:23 +0100] "GET /scripting/java.html HTTP/
```

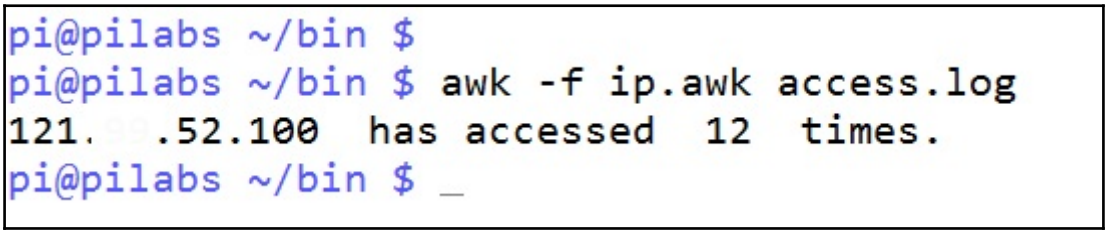
```
pi@pilabs ~/bin $ awk '( $4 ~ /10\/Sep\/2014/ ) { COUNT++ } END { print COUNT } ' access.log
16205
pi@pilabs ~/bin $ _
```

```
pi@pilabs ~/bin $ awk -f status.awk access.log
200  has occurred  23825  times.
206  has occurred  48  times.
301  has occurred  60  times.
302  has occurred  21  times.
304  has occurred  2273  times.
403  has occurred  133  times.
404  has occurred  4382  times.
501  has occurred  63  times.
pi@pilabs ~/bin $ _
```

```
pi@pilabs ~/bin $ awk -f 404.awk access.log
404/old/wp-admin/  has occurred  2  times.
404/monitor.html  has occurred  1  times.
404/windows.html  has occurred  1  times.
404/novell.html  has occurred  1  times.
404/user/  has occurred  2  times.
404/linux.html  has occurred  1  times.
404/zcm10.html  has occurred  1  times.
```


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
3468 /favicon.ico
2330 /wp/wp-content/themes/twentytwelve/style.css?ver=3.9.1
2265 /wp/wp-content/themes/twentytwelve/js/navigation.js?ver=20140711
2199 /wp/wp-includes/js/jquery/jquery.js?ver=1.11.0
2187 /wp/wp-includes/js/jquery/jquery-migrate.min.js?ver=1.2.1
2024 /wp/wp-content/uploads/2014/05/cropped-wp3.png
709 /wp/?feed=rss2
507 /
334 /wp/?p=2407
329 /stylesheets/screen.css
328 /stylesheets/style.css
323 /wp/?p=2415
302 /stylesheets/Softplain.ttf
293 /images/favicon.ico
286 /wp/wp-content/uploads/2013/11/raspi-config1-300x96.png
284 /wp/wp-content/uploads/2013/11/tailshadow.png
256 /wp/wp-content/uploads/2013/11/pdbedit.png
255 /wp/wp-content/uploads/2013/11/shares-300x123.png
255 /wp/wp-content/uploads/2013/11/backup.png
248 /images/tup-coloured1.png
243 /stylesheets/newstyle.css


likegeeks@likegeeks-VirtualBox ~/Desktop
File Edit View Search Terminal Help
74 /wp/xmlrpc.php
62 /wp/?p=1529/wp-login.php
58 /wp/xmlrpc.php?rsd
21 /wp/wp-login.php
19 /wp/wp-login.php?registration=disabled
19 /wp/wp-login.php?action=register
6 /wp-login.php
5 /admin.php
4 /administrator/index.php
3 /wp/wp-trackback.php?p=3043
3 /wp/wp-trackback.php?p=1048
3 /wp/wp-content/uploads/2013/08/php.png
2 /wp/wp-trackback.php?p=586
2 /wp/wp-trackback.php?p=3149
2 /wp/wp-trackback.php?p=3085
2 /lamp/php.html
2 /bitrix/admin/index.php?lang=en
2 /admin/login.php
1 /xmlrpc.php
1 /wp/wp-trackback.php?p=830
1 /wp/wp-trackback.php?p=2357
1 /wp/wp-trackback.php?p=2105
1 /wp/wp-trackback.php?p=1805
1 /wp//wp-content/uploads/wysija/themes/clefault/index.php


pi@pilabs ~/bin $
pi@pilabs ~/bin $ awk -f ip.awk access.log
121. .52.100 has accessed 12 times.
pi@pilabs ~/bin $ _

```
pi@pilabs ~/bin $ awk -f browser.awk access.log
"DoCoMo/2.0  has accessed  7  times.
"com.apple.WebKit.WebContent/10600.1.15  has accessed  4  times.
"Xenu  has accessed  3  times.
"-"  has accessed  90  times.
"PHP/5.3.14"  has accessed  1  times.
"FeedBot"  has accessed  8  times.
"OpenOffice/4.1.0"  has accessed  91  times.
"facebookexternalhit/1.1  has accessed  11  times.
""Mozilla/5.0  has accessed  7  times.
"Feed  has accessed  48  times.
"msnbot-UDiscovery/2.0b  has accessed  9  times.
"Twitterbot/1.0"  has accessed  94  times.
"AdsBot-Google  has accessed  10  times.
"Python-urllib/1.17"  has accessed  1  times.
"HTTP_Request2/2.1.1  has accessed  4  times.
"Mozilla/4.0  has accessed  1713  times.
```

```
root@andrew-15-10:~# awk '( $7 ~ /^to/ )' /var/log/mail.log
Oct 12 17:00:47 andrew-15-10 postfix/local[10109]: 80346680E8: to=<root@andrew-15-10>, relay=local, d
elay=0.14, delays=0.09/0.05/0/0.01, dsn=2.0.0, status=sent (delivered to mailbox)
root@andrew-15-10:~#
```

Chapter 13: A Better lastlog with AWK

```
gdm                                              **Never logged in**
sshd                                             **Never logged in**
tcpdump                                          **Never logged in**
tux              pts/1    localhost              Tue Oct 20 13:02:35 +0100 2015
bob                                              **Never logged in**
u1                                               **Never logged in**
vboxadd                                          **Never logged in**
```

```
centos6 ~ $ lastlog -u 500-5000
Username         Port     From             Latest
tux              pts/1    localhost        Tue Oct 20 13:02:35 +0100 2015
bob                                        **Never logged in**
u1                                         **Never logged in**
centos6 ~ $
```

```
centos6 ~ $ lastlog | awk -f ll.awk
tux              pts/1    localhost        Tue Oct 20 13:02:35 +0100 2015
====================
Total Number of Users Processed:  1
centos6 ~ $
```

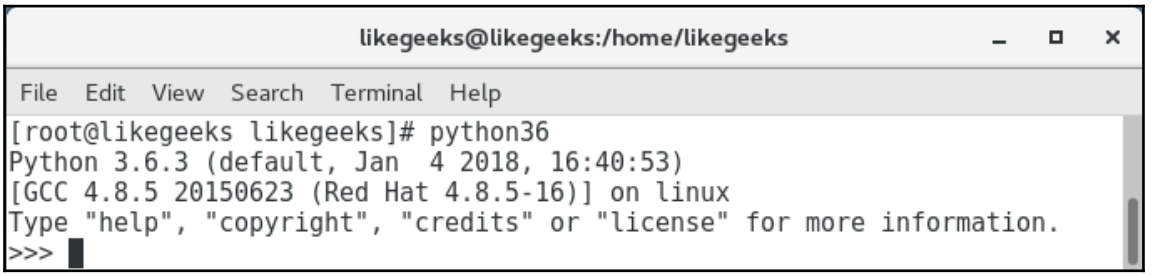
```
centos6 ~ $ lastlog | awk -f ll.awk
tux              pts/1    192.168.0.3      Thu Oct 22 13:31:04 +0100 2015
bob              tty1                      Thu Oct 22 13:34:48 +0100 2015
====================
Total Number of Users Processed:  2
centos6 ~ $
```

```
centos6 ~ $ lastlog | awk -f ll.awk
Username  Login date
====================
     tux 22 Oct 2015
     bob 22 Oct 2015
====================
Total Number of Users Processed:  2
centos6 ~ $
```

```
centos6 ~ $ awk -f vh.awk search=packt virtualhost.conf
<VirtualHost *:80>
DocumentRoot /www/packt
ServerName www.packtpub.com
# Other directives here
</VirtualHost>
centos6 ~ $
```

```
centos6 ~ $ awk -f catalog.awk search=drill catalog.xml
name: drill price: 99 stock: 5
centos6 ~ $
```

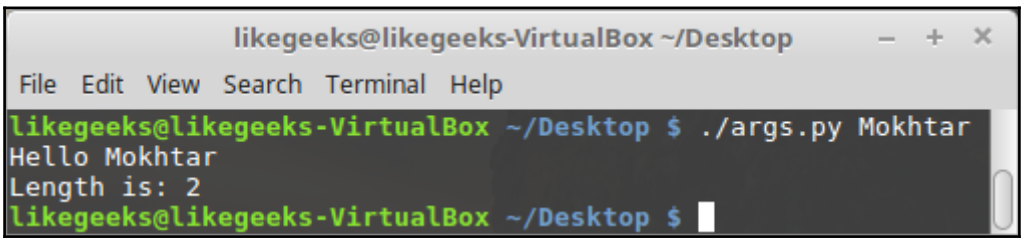
Chapter 14: Using Python as a Bash Scripting Alternative

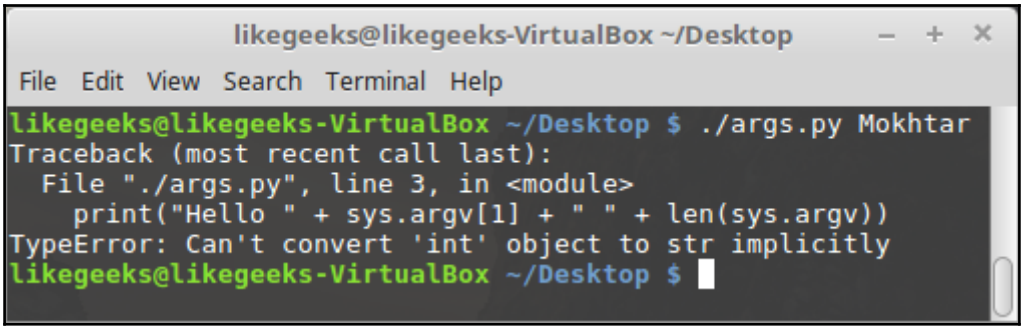



```
>>> import sys
>>> sys.version
'3.2.3 (default, Mar  1 2013, 11:53:50) \n[GCC 4.6.3]'
>>> _
```

```
>>> import this
The Zen of Python, by Tim Peters

Beautiful is better than ugly.
Explicit is better than implicit.
Simple is better than complex.
Complex is better than complicated.
Flat is better than nested.
Sparse is better than dense.
Readability counts.
Special cases aren't special enough to break the rules.
Although practicality beats purity.
Errors should never pass silently.
Unless explicitly silenced.
In the face of ambiguity, refuse the temptation to guess.
There should be one-- and preferably only one --obvious way to do it.
Although that way may not be obvious at first unless you're Dutch.
Now is better than never.
Although never is often better than *right* now.
If the implementation is hard to explain, it's a bad idea.
If the implementation is easy to explain, it may be a good idea.
Namespaces are one honking great idea -- let's do more of those!
>>> _
```

```
pi@pilabs ~/bin $ ./args.py fred
Hello fred
pi@pilabs ~/bin $ _
```

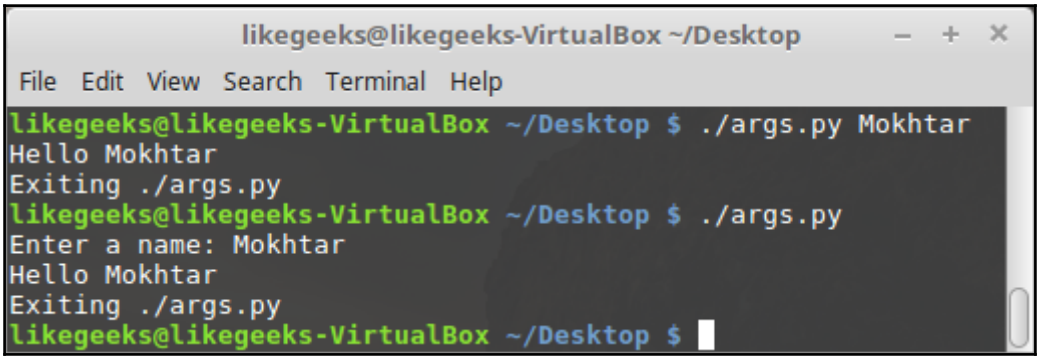




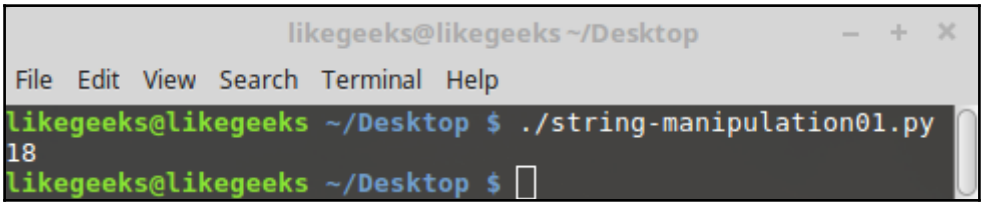

```
pi@pilabs ~/bin $ ./args.py
Traceback (most recent call last):
  File "./args.py", line 3, in <module>
    print("Hello " + sys.argv[1] + " " + str(len(sys.argv)))
IndexError: list index out of range
pi@pilabs ~/bin $ _
```

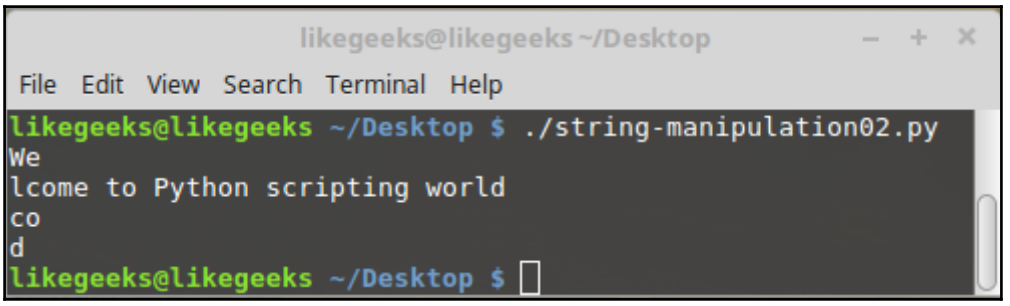
```
pi@pilabs ~/bin $ ./args.py
Exiting ./args.py
pi@pilabs ~/bin $ ./args.py fred
Arguments supplied: 2
Hello fred
Exiting ./args.py
```

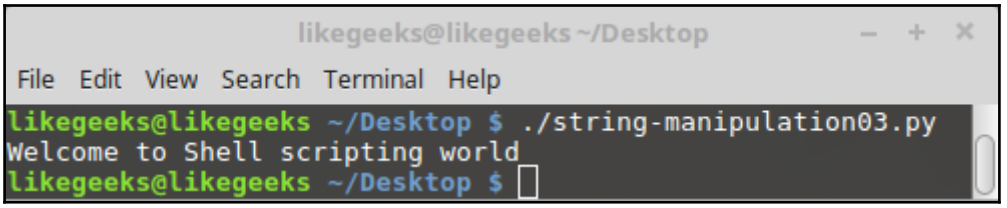
```
#!/usr/bin/python3
import sys
count = len(sys.argv)
name = ''

if ( count == 1 ):
    name = input("Enter a name: ")
else:
    name = sys.argv[1]

print("Hello " + name)
print("Exiting " + sys.argv[0])
```

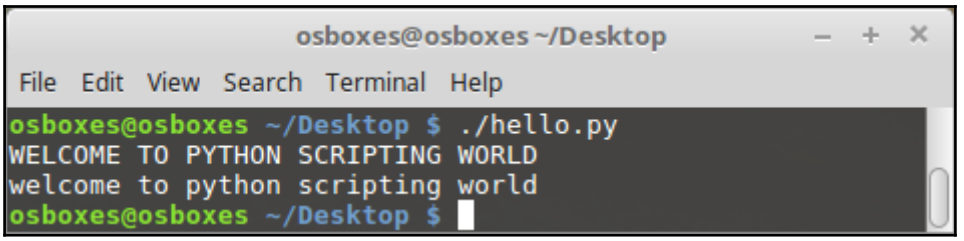


```python
#!/usr/bin/python3
import sys
count = len(sys.argv)
name = ''

if ( count == 1 ):
    name = input("Enter a name: ")
else:
    name = sys.argv[1]

log = open("/tmp/script.log","a")
log.write("Hello " + name + "\n")
log.close()
```






likegeeks@likegeeks ~/Desktop
File Edit View Search Terminal Help
likegeeks@likegeeks ~/Desktop $ ./string-manipulation03.py
Welcome to Shell scripting world
likegeeks@likegeeks ~/Desktop $


osboxes@osboxes ~/Desktop
File Edit View Search Terminal Help
osboxes@osboxes ~/Desktop $ ./hello.py
WELCOME TO PYTHON SCRIPTING WORLD
welcome to python scripting world
osboxes@osboxes ~/Desktop $