

Addis Ababa University
Addis Ababa Institute of Technology

Operating Systems

LAB 01

Objective: Familiarize with the Linux environment

- Basic Linux commands
- Basic shell scripting

Basic Linux commands

ls : this command displays the files and directories.

man [COMMAND NAME]: provides help on how to use a given command.

[COMMAND NAME] -- help : provides help on how to use a given command.

Example

```
man ls  
ls -- help
```

Exit codes in Linux : **echo \$?**

Exercise 1 – File/Directory Listing

- Display the contents of the current directory using **ls** command
- Try options **-a** or **-l** or **-i** or **-R**
- Use clear command to clear the screen
- Experiment with **ls** command by trying different options. (use **man ls** for more information)

Exercise 2 –Directory Commands

- Use the **pwd** command to display the current working directory
- Create a new directory called OS using **mkdir** command
- Use the **cp** command to copy a file from the current directory to OS
- Use the **mv** command to change the name of OS to OSLAB
- Display contents of OS; type **ls OSLAB**
- Use **cd** command to change the current directory to OSLAB; **cd OSLAB**
- Use **ls** to display contents
- Change to the root directory (**cd /**)
- Change to the home directory of the current user (**cd ~**)
- Remove the OSLAB directory; **rmdir OSLAB**. Why does it fail to remove?
 - First remove the file that OSLAB contains using **rm OSLAB/{Filename}**.
 - Then use **rmdir OSLAB**.

Exercise 3 – Study the function of the following commands

- date
- who -H
- tty
- cal
- head
- tail
- cat
- more
- grep
- sort
- top
- output redirection (>) and pipe (|)

Expression	Description
^	Start of string e.g. (grep ^a filename)
\$	End of string e.g. (grep a\$ filename)

Exercise 4 – Shell Programming

A. Usage of variable

- Type the following using a text editor (gedit)

```
echo What is your
name?
read name
echo Hi $name
```

- Save the file as 1.sh
- Run the script on a terminal; **./1.sh**
- Change the file mode bits. **chmod 777 1.sh**
- Run the script again; **./1.sh**

	Permission Type	symbol
0	No Permission	- - -
1	Execute	- - x
2	Write	- w -
3	Write + Execute	- wx
4	Read	r - -
5	Read + Execute	r - x
6	Read + Write	r w -
7	Read + Write + Execute	r w x

B. Arithmetic operation

```
echo Enter X:
read x
echo Enter Y:
read y

echo Method 1
echo $x + $y = $[x+y]
echo $x - $y = $[x-y]
echo $x \* $y = $[x*y]
echo $x / $y = $[x/y]

echo Method 2
echo $x + $y = $((x+y))
echo $x - $y = $((x-y))
echo $x \* $y = $((x*y))
echo $x / $y = $((x/y))
```

```
echo ---SUM USING FOR---
for((i=0;i<=x;i++))
do
s=$((s+i))
done
echo sum 1..$x = $s

echo ODD/EVEN NUMBERS
1..10
for((k=1;k<=10;k++))
do
if((k%2 == 0));then
echo $k is even
else
echo $k is odd
fi
done
```

- A. Write a shell script that adds numbers 1 to N (use while loop)
- B. Write a shell script that calculates the factorial of N

C. Writing perl script

```
#!/usr/bin/perl
print("Welcome to Perl Addition\n");
print("A: ");
$A = <STDIN>;
print("B: ");
$B = <STDIN>;
$SUM = $A + $B;
$DIF = $A - $B;
$MUL = $A * $B;
$DIV = $A / $B;
print("sum = $SUM\n");
print("diff = $DIF\n");
print("prod = $MUL\n");
print("div = $DIV\n");
```

- Save the file as a.pl
- Run the script on a terminal; **perl a.pl**

Expression	Description
.	Any character
^	Start of string
\$	End of string
*	Zero or times of preceding string
\	Represent special character
?	Exactly one character
()	Groups regular expressions
{n}	preceding character appearing n times
{n,m}	preceding character appearing n times but not more than m
{n,}	preceding character appearing n times or more
\+	One or more occurrence of previous character
\?	Zero or more occurrence of previous character

Examples

echo {0..10}

echo {a..z}

echo {aa, bb, cc, dd}

echo a{0..9}b

cat filename | grep -E p\{2} searches for p appearing exactly two times