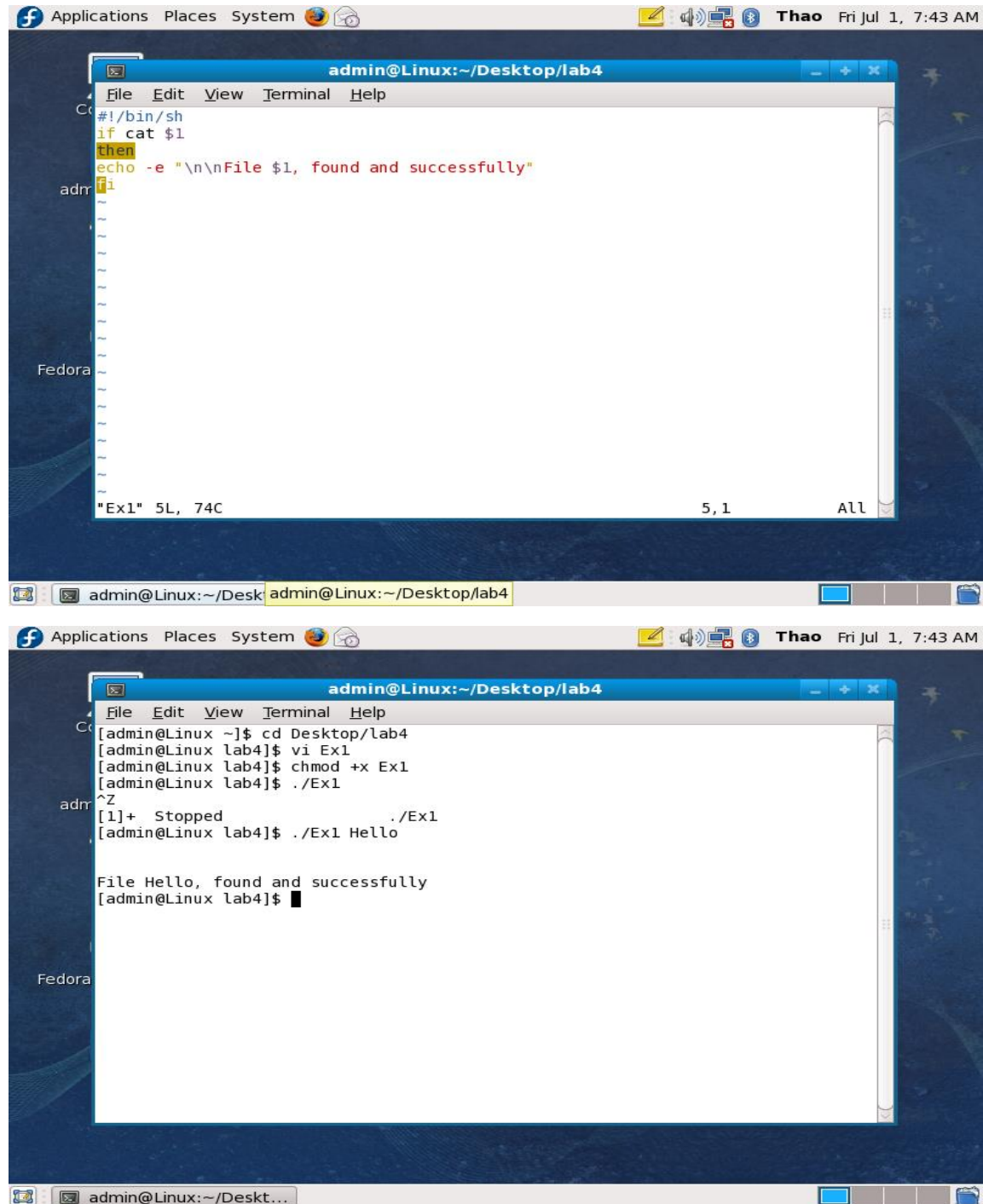


Name: Hà Thị Phương Thảo – SE161620

Class: SE1743

LAB4

If constructs



The image consists of two screenshots of a Linux desktop environment, specifically Fedora, showing a terminal window titled "admin@Linux:~/Desktop/lab4".

The top screenshot shows the terminal with the following content:

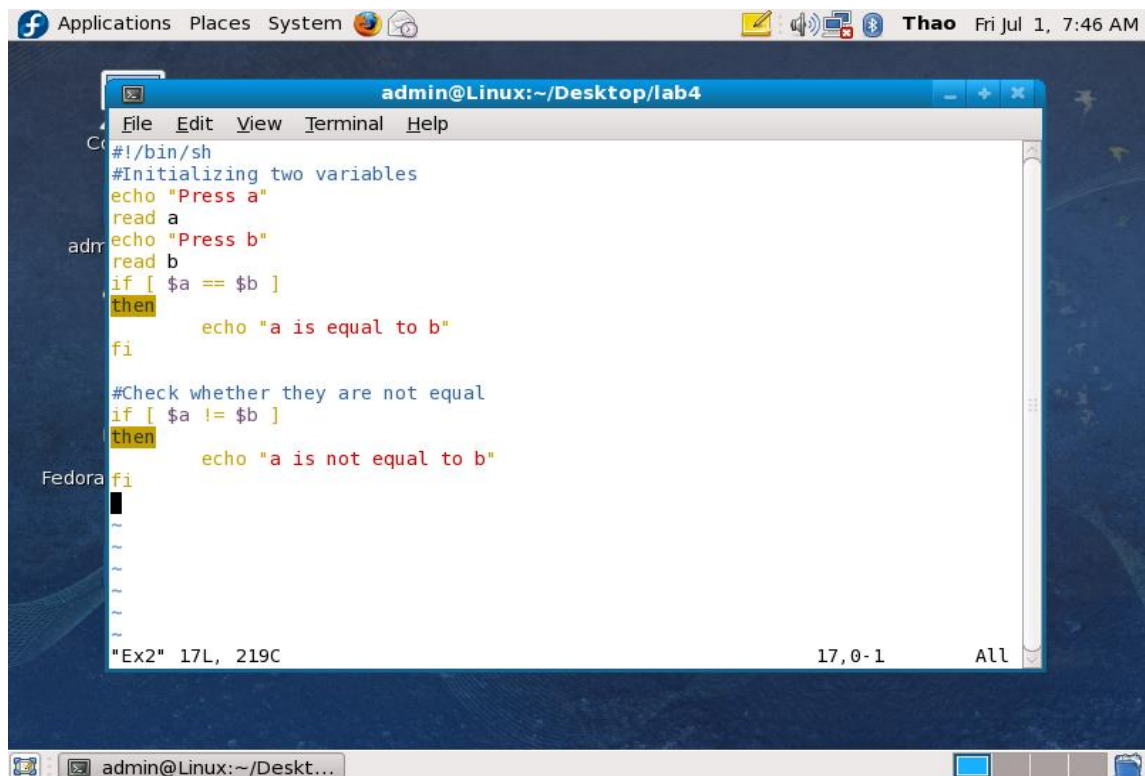
```
admin@Linux:~/Desktop/lab4
# /bin/sh
if cat $1
then
echo -e "\n\nFile $1, found and successfully"
fi
```

The bottom screenshot shows the terminal after several commands have been executed:

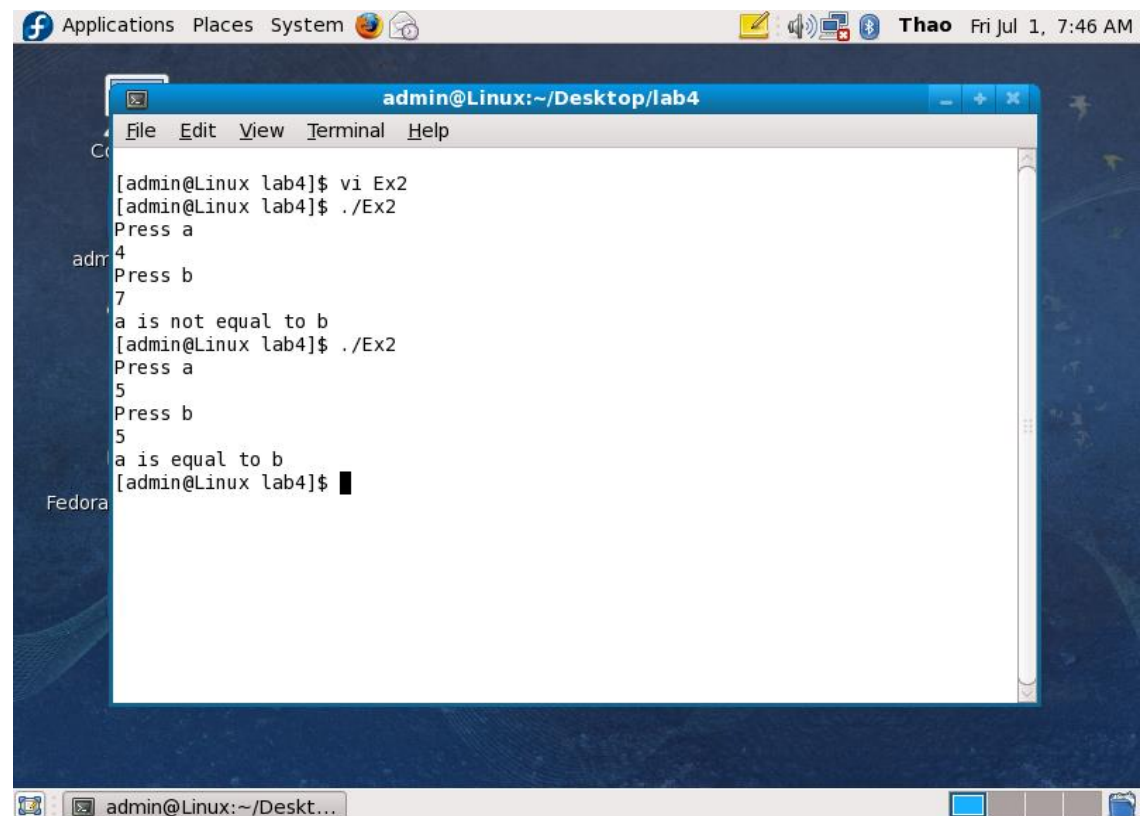
```
[admin@Linux ~]$ cd Desktop/lab4
[admin@Linux lab4]$ vi Ex1
[admin@Linux lab4]$ chmod +x Ex1
[admin@Linux lab4]$ ./Ex1
^Z
[1]+  Stopped                  ./Ex1
[admin@Linux lab4]$ ./Ex1 Hello

File Hello, found and successfully
[admin@Linux lab4]$
```





If....else constructs







```
admin@Linux:~/Desktop/lab4
File Edit View Terminal Help
#!/bin/sh
#Initializing two variables
echo "Press a"
read a
echo "Press b"
read b
if [ $a == $b ]
then
    echo "a is equal to b"
fi
#Check whether they are not equal
if [ $a != $b ]
then
    echo "a is not equal to b"
fi
"Ex2" 17L, 219C 17,0-1 All
```



```
admin@Linux:~/Desktop/lab4
File Edit View Terminal Help
[admin@Linux lab4]$ vi Ex2
[admin@Linux lab4]$ ./Ex2
Press a
4
Press b
7
a is not equal to b
[admin@Linux lab4]$ ./Ex2
Press a
5
Press b
5
a is equal to b
[admin@Linux lab4]$
```

Applications Places System     **Thao** Fri Jul 1, 7:47 AM

```
admin@Linux:~/Desktop/lab4
File Edit View Terminal Help
#!/bin/sh
#Initializing two variables
echo "Press a"
read a
echo "Press b"
read b
if [ $a -eq $b ]
then
    echo "$a is equal to $b"
elif [ $a -gt $b ]
then
    echo "$a is greater than $b"
else [ $a -lt $b ]
    echo "$a is smaller than $b"
fi
"Ex3" [readonly] 16L, 238C 16,0-1 All
```

admin@Linux:~/Desktop/lab4 Applications Places System     **Thao** Fri Jul 1, 7:49 AM

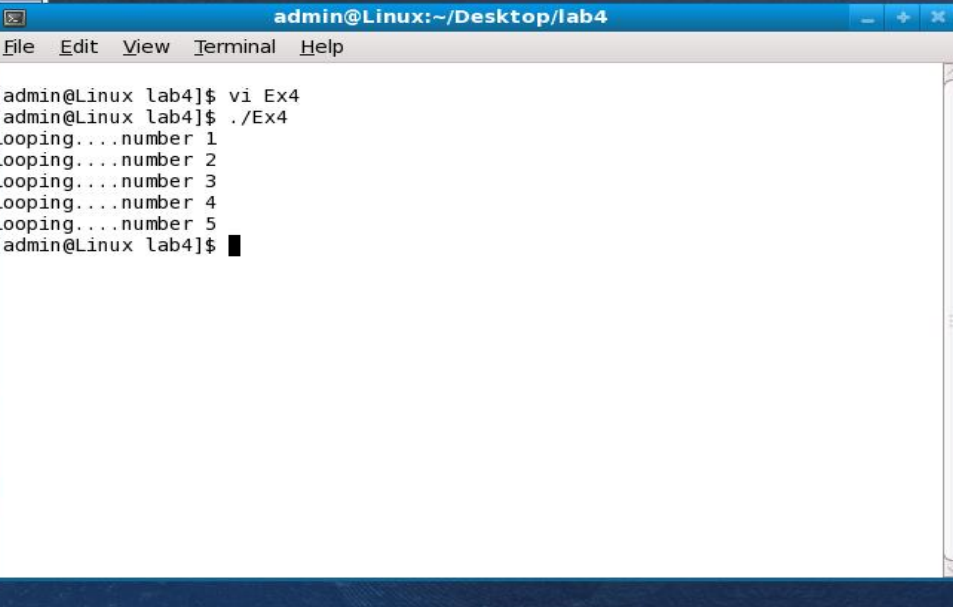
```
admin@Linux:~/Desktop/lab4
File Edit View Terminal Help
[admin@Linux lab4]$ ./Ex3
Press a
6
Press b
7
./Ex3: line 10: [: too many arguments
6 is smaller than 7
[admin@Linux lab4]$ ./Ex3
Press a
9
Press b
2
./Ex3: line 10: [: too many arguments
9 is smaller than 2
[admin@Linux lab4]$
```

For loop:

The screenshot shows a terminal window titled "admin@Linux:~/Desktop/lab4". The window contains a shell script with the following code:

```
#!/bin/sh
for i in 1 2 3 4 5
do
    echo "Looping...number $i"
done
```

The terminal output shows the script being executed, with the prompt "admin@Linux:~/Desktop/lab4" visible. The status bar at the bottom of the terminal window displays "Ex4" 6L, 67C, 6,0-1, and All.

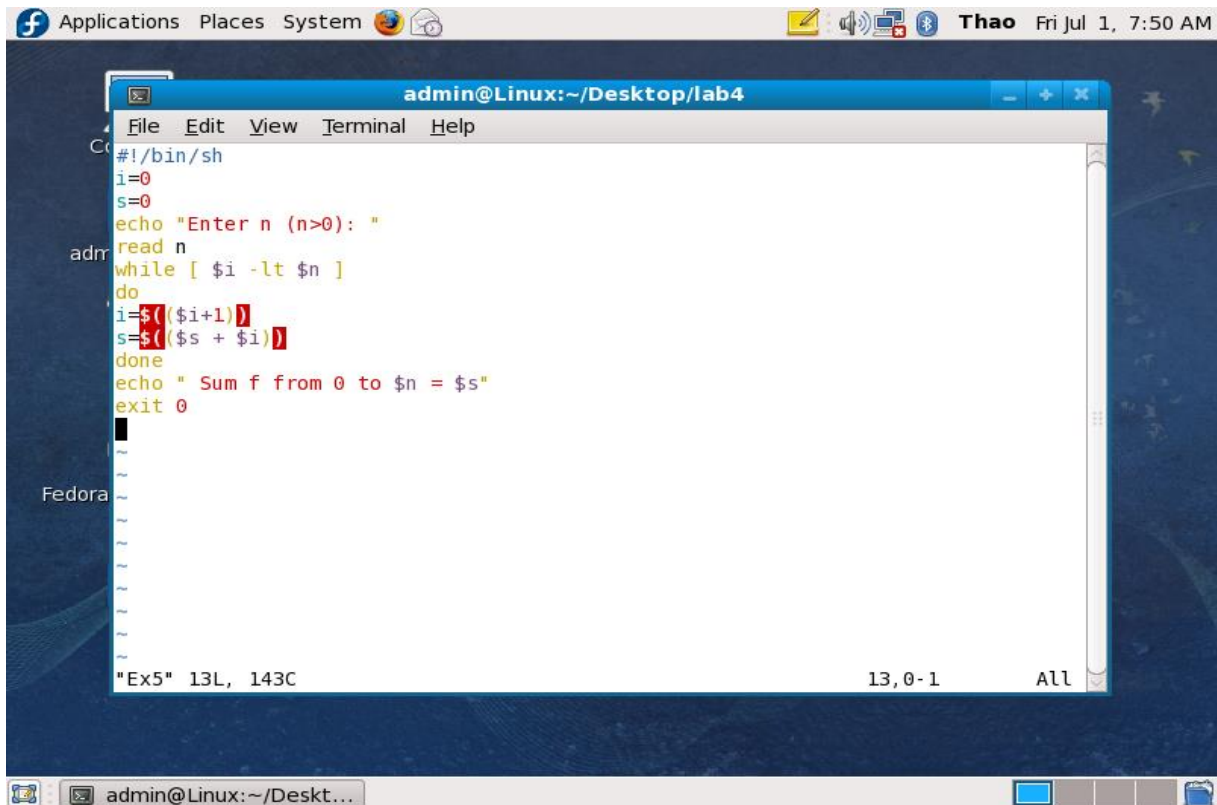


The screenshot shows a Linux desktop environment. At the top, there is a menu bar with 'Applications', 'Places', and 'System'. To the right of the menu bar are system status icons: a yellow notepad icon, a speaker icon, a network icon, a Bluetooth icon, and a battery icon. The name 'Thao' and the date/time 'Fri Jul 1, 7:50 AM' are displayed on the far right. The desktop background is a dark blue image with a subtle pattern. A terminal window is open, titled 'admin@Linux:~/Desktop/lab4'. The terminal has a menu bar with 'File', 'Edit', 'View', 'Terminal', and 'Help'. The terminal content shows the following commands and output:

```
[admin@Linux lab4]$ vi Ex4
[admin@Linux lab4]$ ./Ex4
Looping...number 1
Looping...number 2
Looping...number 3
Looping...number 4
Looping...number 5
[admin@Linux lab4]$
```

The terminal window is positioned in the center of the desktop. The taskbar at the bottom shows the terminal window's icon and title 'admin@Linux:~/Desk...'. There are also icons for a blue square, a grey square, and a blue square with a white icon.

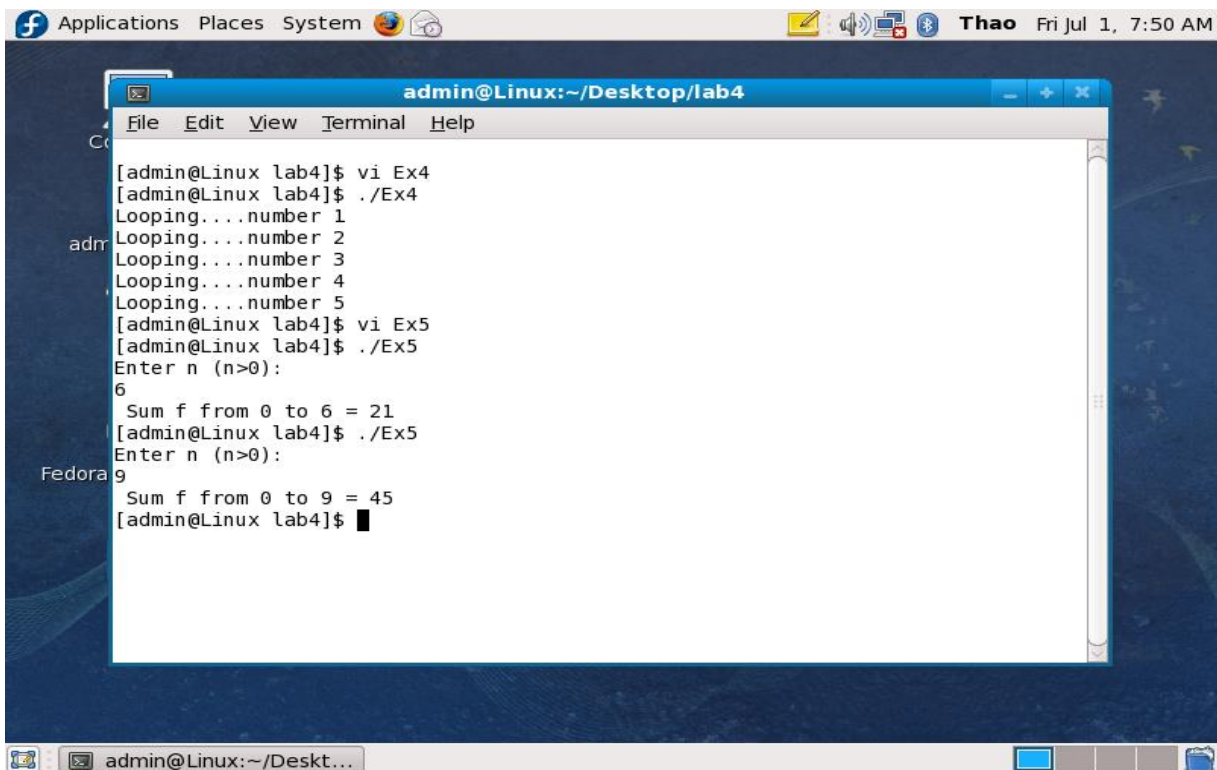
While loop:



A screenshot of a Linux desktop environment. The top panel shows the 'Applications Places System' menu and system status icons. The main window is a terminal titled 'admin@Linux:~/Desktop/lab4'. It contains a shell script for calculating the sum of numbers from 0 to n using a while loop. The script is as follows:

```
#!/bin/sh
i=0
s=0
echo "Enter n (n>0): "
read n
while [ $i -lt $n ]
do
i=$((i+1))
s=$((s + i))
done
echo " Sum f from 0 to $n = $s"
exit 0
```

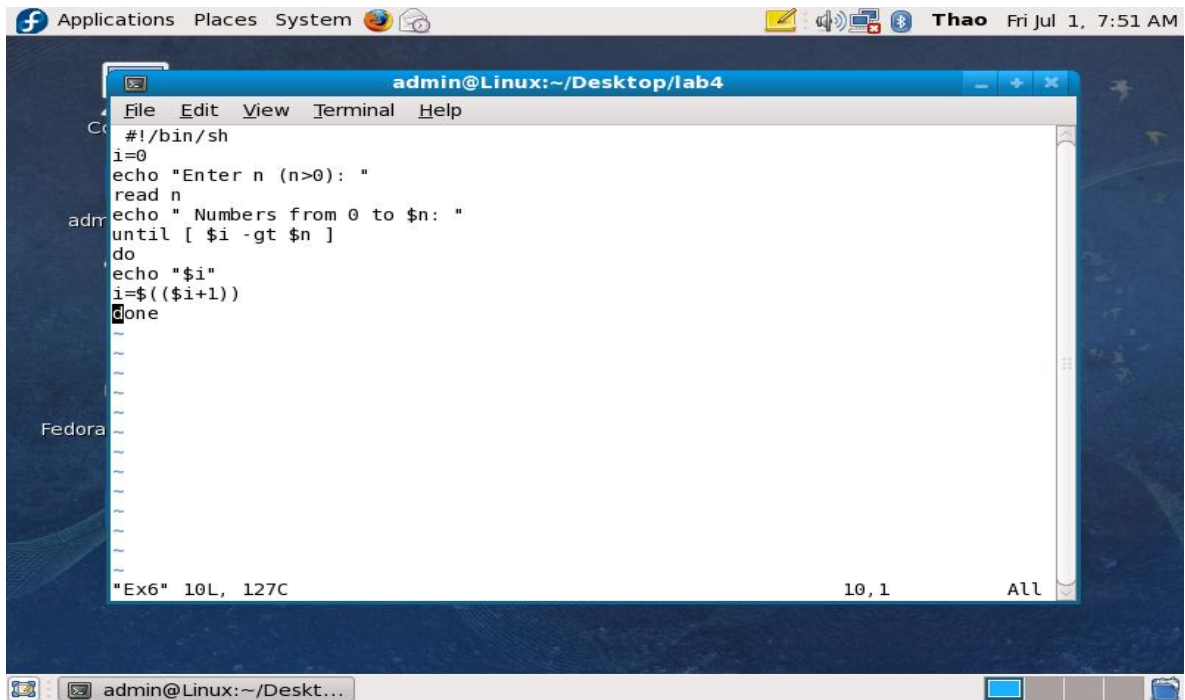
The terminal status bar at the bottom shows 'Ex5" 13L, 143C', '13,0-1', and 'All'.



A screenshot of the same Linux desktop environment. The terminal window shows the execution of the script. The user runs 'vi Ex4' and './Ex4', which outputs a loop from 1 to 5. Then, the user runs 'vi Ex5' and './Ex5', which prompts for a value of n. The user enters 6, and the script outputs the sum from 0 to 6 as 21. Then, the user enters 9, and the script outputs the sum from 0 to 9 as 45.

```
[admin@Linux lab4]$ vi Ex4
[admin@Linux lab4]$ ./Ex4
Looping...number 1
Looping...number 2
Looping...number 3
Looping...number 4
Looping...number 5
[admin@Linux lab4]$ vi Ex5
[admin@Linux lab4]$ ./Ex5
Enter n (n>0):
6
Sum f from 0 to 6 = 21
[admin@Linux lab4]$ ./Ex5
Enter n (n>0):
9
Sum f from 0 to 9 = 45
[admin@Linux lab4]$
```

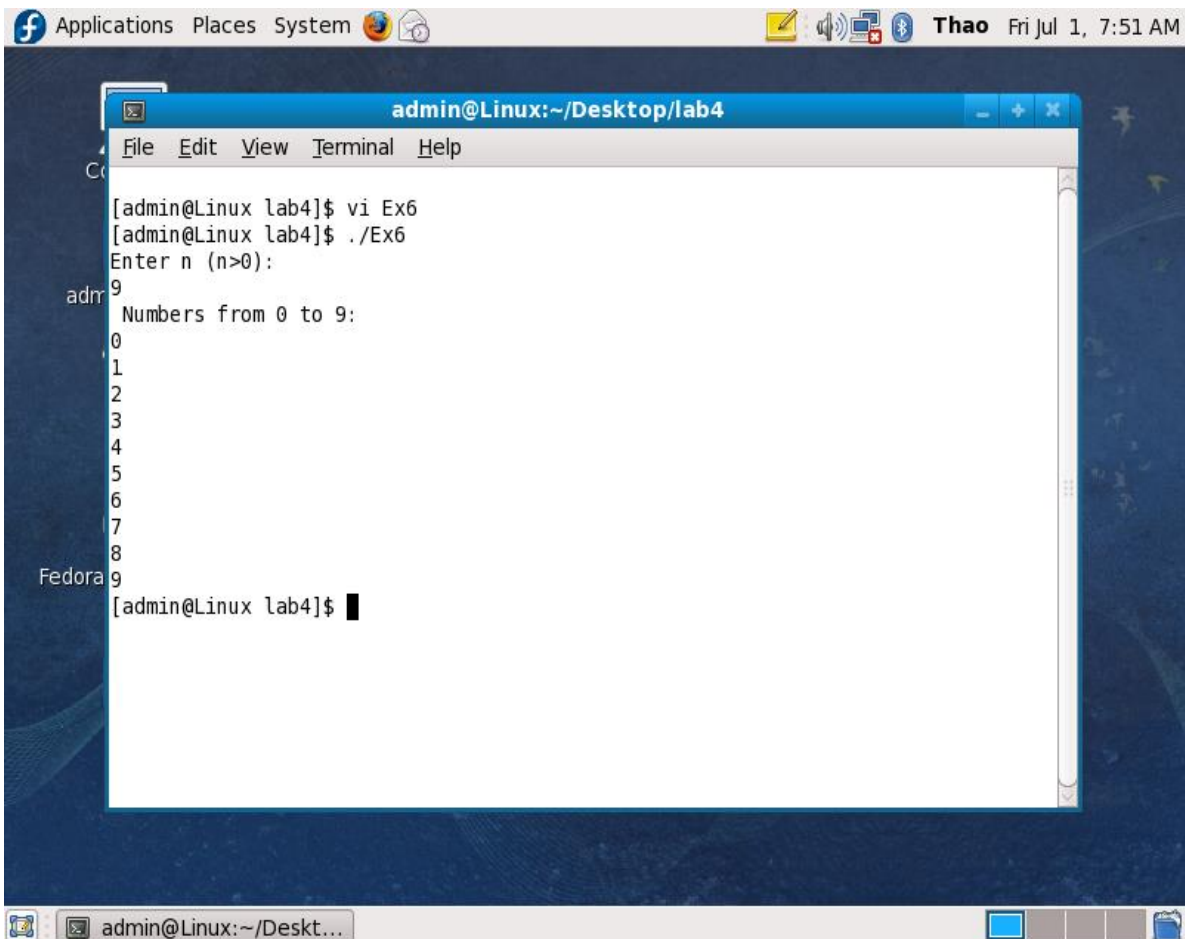
Until loop:



A terminal window titled "admin@Linux:~/Desktop/lab4" is shown. The window contains the following text:

```
#!/bin/sh
i=0
echo "Enter n (n>0): "
read n
echo " Numbers from 0 to $n: "
until [ $i -gt $n ]
do
echo "$i"
i=$((i+1))
done
```

The terminal status bar at the bottom shows "Ex6" 10L, 127C, 10, 1, and All.

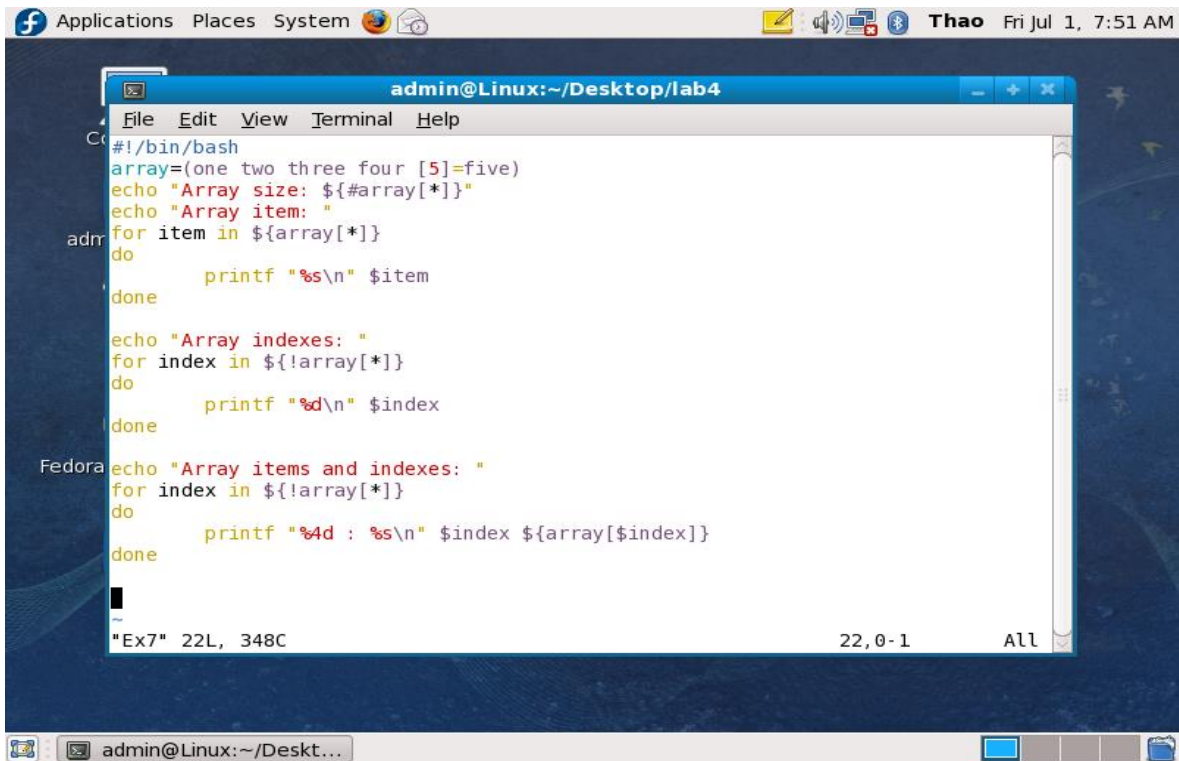


A terminal window titled "admin@Linux:~/Desktop/lab4" is shown. The window contains the following text:

```
[admin@Linux lab4]$ vi Ex6
[admin@Linux lab4]$ ./Ex6
Enter n (n>0):
9
Numbers from 0 to 9:
0
1
2
3
4
5
6
7
8
9
[admin@Linux lab4]$
```

The terminal status bar at the bottom shows "admin@Linux:~/Deskt..."

Array:

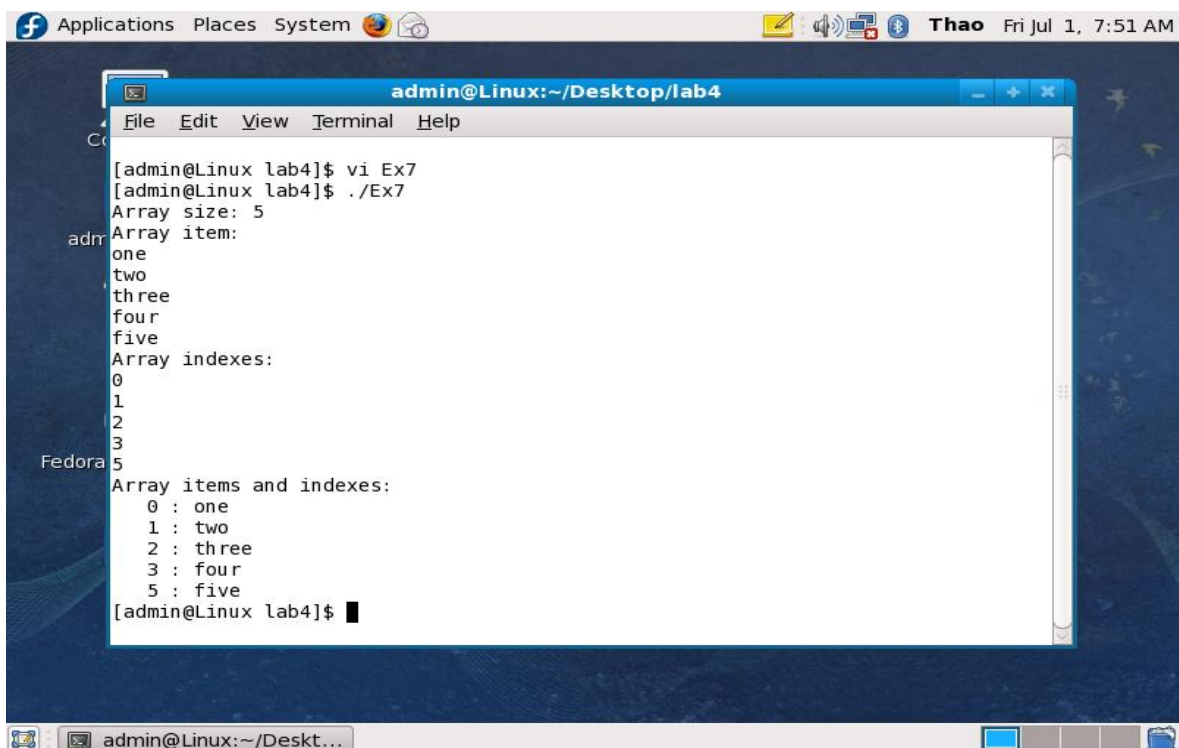


A terminal window titled "admin@Linux:~/Desktop/lab4" showing a bash script. The script defines an array with five elements, prints its size, iterates over its items, prints their indices, and finally prints each item with its index. The window has a menu bar with "File", "Edit", "View", "Terminal", and "Help". The status bar at the bottom shows "admin@Linux:~/Desk...", "22,0-1", and "All".

```
#!/bin/bash
array=(one two three four [5]=five)
echo "Array size: ${#array[*]}"
echo "Array item: "
for item in ${array[*]}
do
    printf "%s\n" $item
done

echo "Array indexes: "
for index in ${!array[*]}
do
    printf "%d\n" $index
done

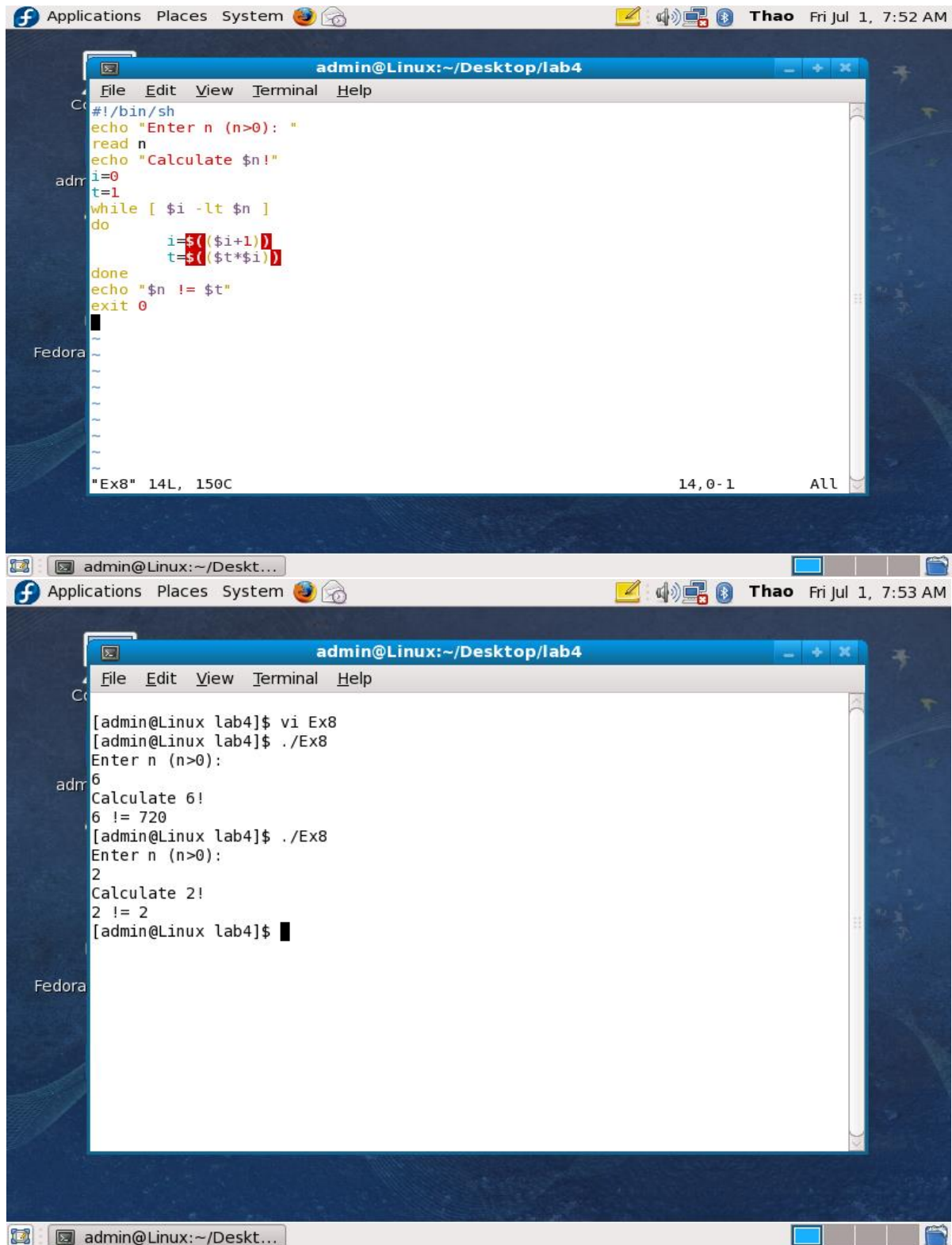
echo "Array items and indexes: "
for index in ${!array[*]}
do
    printf "%4d : %s\n" $index ${array[$index]}
done
```



The same terminal window showing the execution of the script. The user runs "vi Ex7" and then "./Ex7". The output displays the array size (5), the array items (one, two, three, four, five), the array indexes (0, 1, 2, 3, 5), and the array items with their indexes (0 : one, 1 : two, 2 : three, 3 : four, 5 : five). The window title is "admin@Linux:~/Desktop/lab4". The status bar shows "admin@Linux:~/Desk...".

```
[admin@Linux lab4]$ vi Ex7
[admin@Linux lab4]$ ./Ex7
Array size: 5
Array item:
one
two
three
four
five
Array indexes:
0
1
2
3
5
Array items and indexes:
 0 : one
 1 : two
 2 : three
 3 : four
 5 : five
[admin@Linux lab4]$
```

Factorial:



The image consists of two screenshots of a Linux desktop environment, specifically Fedora, showing a terminal window titled "admin@Linux:~/Desktop/lab4".

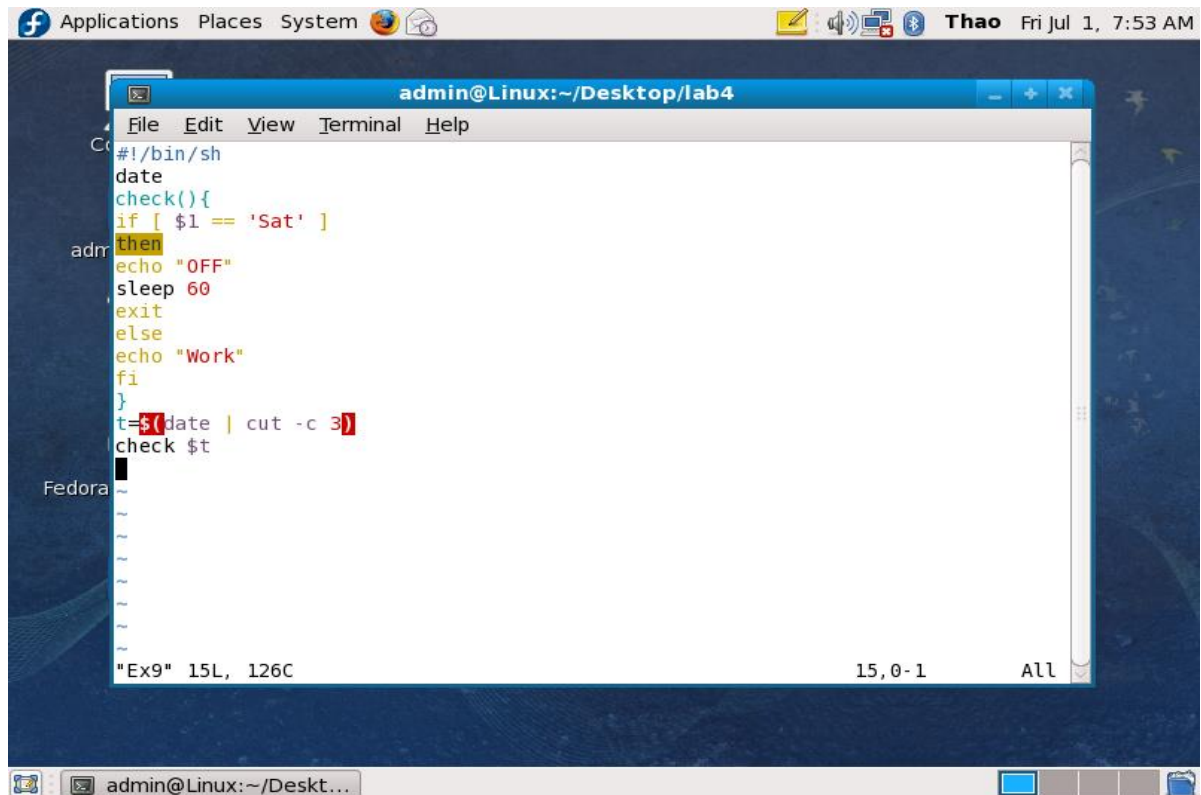
The first screenshot shows the terminal with a script being edited. The script is a shell script that calculates the factorial of a number n . The code is as follows:

```
#!/bin/sh
echo "Enter n (n>0): "
read n
echo "Calculate $n!"
i=0
t=1
while [ $i -lt $n ]
do
    i=$((i+1))
    t=$((t*i))
done
echo "$n != $t"
exit 0
```

The second screenshot shows the terminal after the script has been executed. The user has run `vi Ex8` and then `./Ex8`. The output shows the calculation of 6! and 2!.

```
[admin@Linux lab4]$ vi Ex8
[admin@Linux lab4]$ ./Ex8
Enter n (n>0):
6
Calculate 6!
6 != 720
[admin@Linux lab4]$ ./Ex8
Enter n (n>0):
2
Calculate 2!
2 != 2
[admin@Linux lab4]$
```

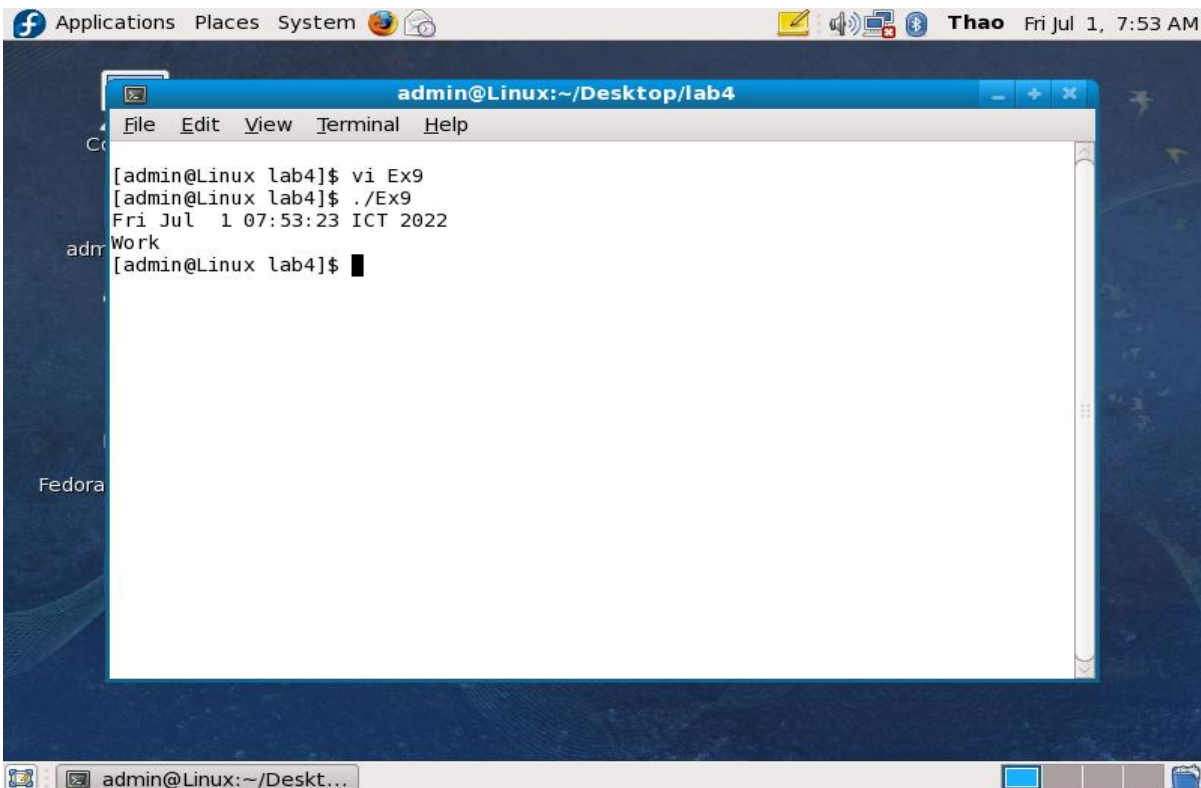

Check date:



The screenshot shows a terminal window titled 'admin@Linux:~/Desktop/lab4'. The window contains a script named 'Ex9' with the following content:

```
#!/bin/sh
date
check(){
if [ $1 == 'Sat' ]
then
echo "OFF"
sleep 60
exit
else
echo "Work"
fi
}
t=$(date | cut -c 3)
check $t
```

The terminal window has a menu bar with 'File', 'Edit', 'View', 'Terminal', and 'Help'. The status bar at the bottom shows 'admin@Linux:~/Desk...'.

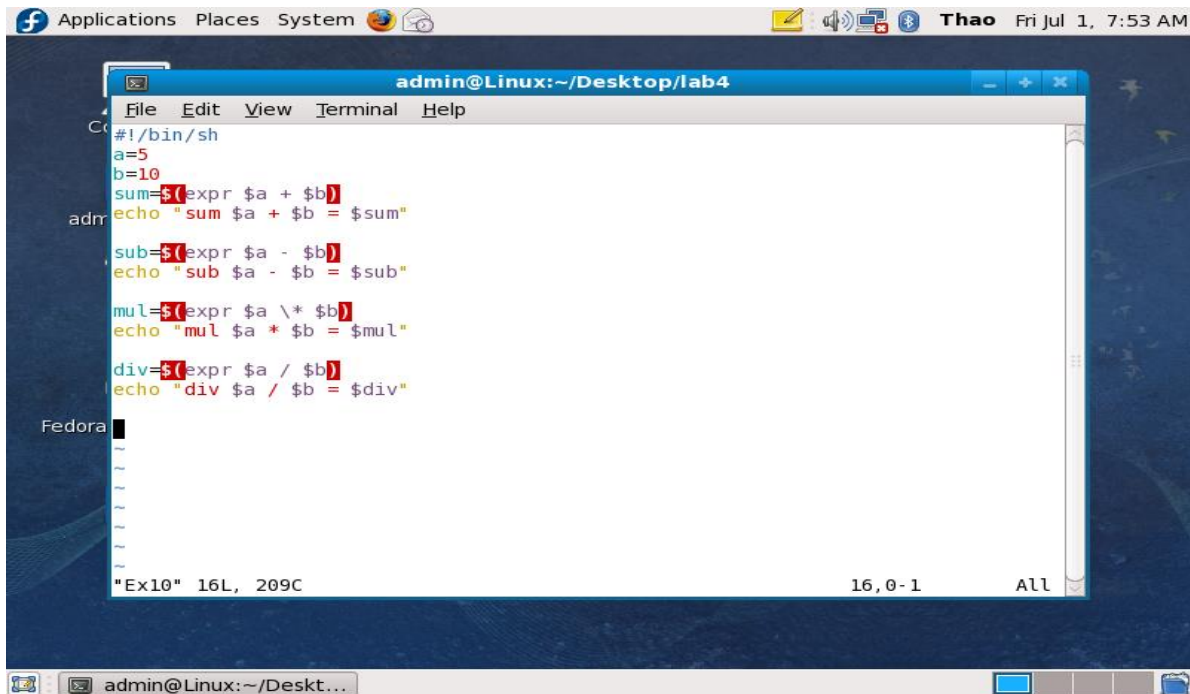


The screenshot shows the same terminal window after the script 'Ex9' has been executed. The output is as follows:

```
[admin@Linux lab4]$ vi Ex9
[admin@Linux lab4]$ ./Ex9
Fri Jul 1 07:53:23 ICT 2022
Work
[admin@Linux lab4]$
```

The terminal window shows the command prompt, the execution of the script, and the resulting output. The status bar at the bottom remains the same.

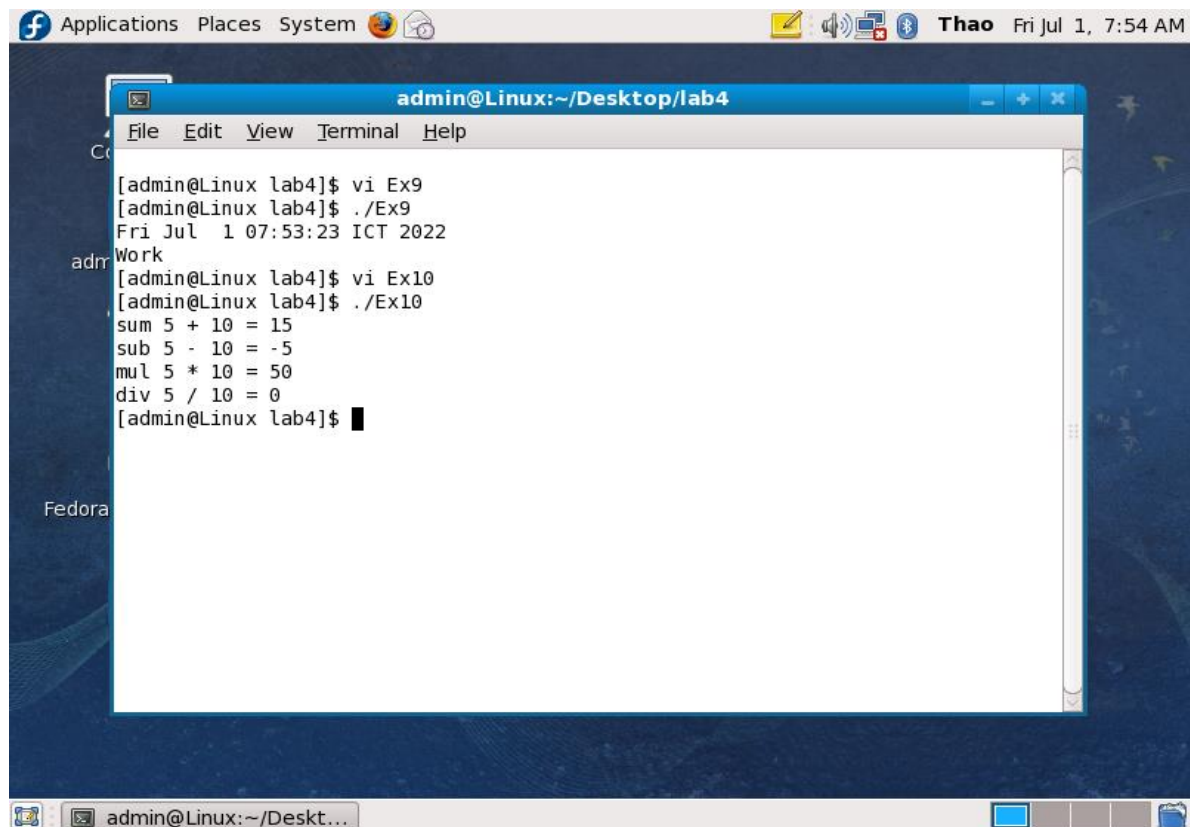
Arithmetic Operation



A terminal window titled "admin@Linux:~/Desktop/lab4" with a menu bar (File, Edit, View, Terminal, Help). The terminal shows a shell script being executed. The script sets variables a=5 and b=10, then performs addition, subtraction, multiplication, and division using the 'expr' command, with results displayed using 'echo'. The background is a Fedora Linux desktop with a blue and green pattern.

```
admin@Linux:~/Desktop/lab4
#!/bin/sh
a=5
b=10
sum=$(expr $a + $b)
echo "sum $a + $b = $sum"
sub=$(expr $a - $b)
echo "sub $a - $b = $sub"
mul=$(expr $a \* $b)
echo "mul $a * $b = $mul"
div=$(expr $a / $b)
echo "div $a / $b = $div"
```

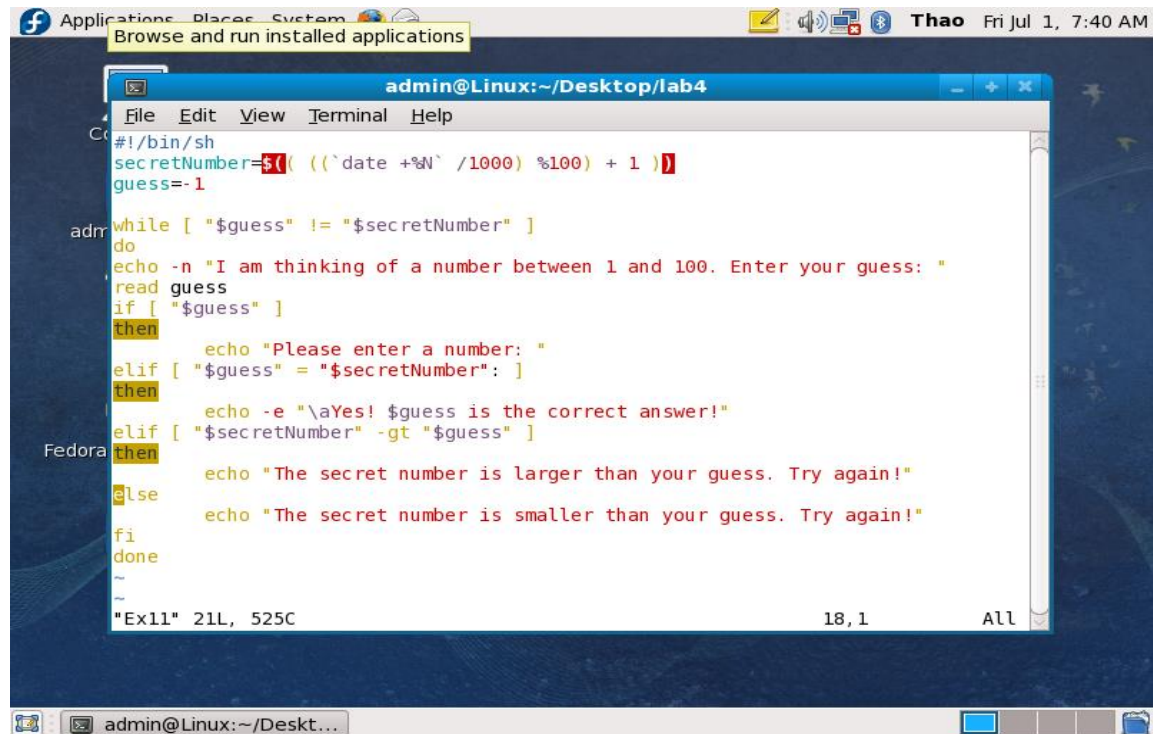
"Ex10" 16L, 209C 16,0-1 All



The same terminal window after running the script. It shows the user navigating to the 'lab4' directory, editing 'Ex9', and then running 'Ex10'. The output of the script is displayed, showing the results of the arithmetic operations. The background remains the same Fedora Linux desktop.

```
[admin@Linux lab4]$ vi Ex9
[admin@Linux lab4]$ ./Ex9
Fri Jul 1 07:53:23 ICT 2022
Work
[admin@Linux lab4]$ vi Ex10
[admin@Linux lab4]$ ./Ex10
sum 5 + 10 = 15
sub 5 - 10 = -5
mul 5 * 10 = 50
div 5 / 10 = 0
[admin@Linux lab4]$
```

Luckily number:

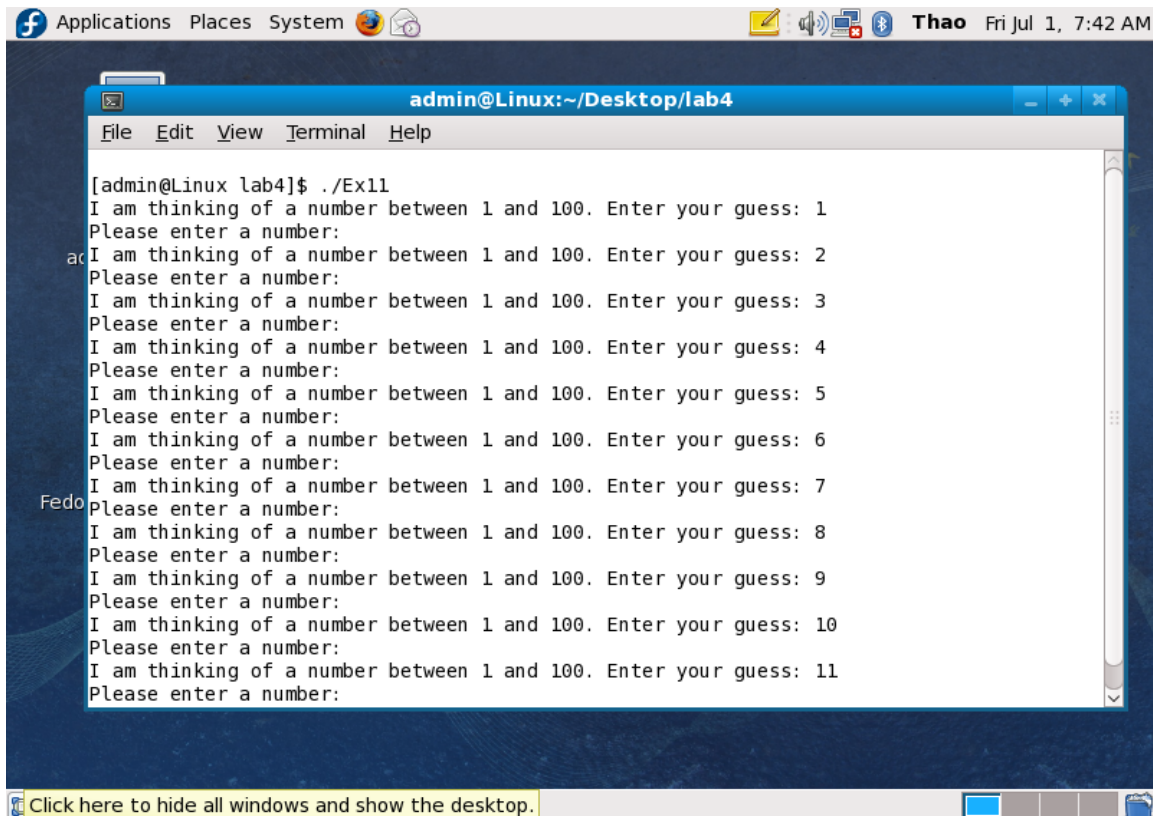


The screenshot shows a Linux desktop with a blue background. A terminal window titled "admin@Linux:~/Desktop/lab4" is open. The terminal displays a shell script for a number-guessing game. The script sets a secret number based on the current date and time, then enters a loop where it prompts the user to guess a number between 1 and 100. It provides feedback on whether the guess is correct, too high, or too low. The terminal output shows the script being executed, with the secret number being 18 and the user guessing 1.

```
#!/bin/sh
secretNumber=$(( (`date +%N` /1000) %100) + 1 )
guess=-1

while [ "$guess" != "$secretNumber" ]
do
echo -n "I am thinking of a number between 1 and 100. Enter your guess: "
read guess
if [ "$guess" ]
then
echo "Please enter a number: "
elif [ "$guess" = "$secretNumber": ]
then
echo -e "\aYes! $guess is the correct answer!"
elif [ "$secretNumber" -gt "$guess" ]
then
echo "The secret number is larger than your guess. Try again!"
else
echo "The secret number is smaller than your guess. Try again!"
fi
done

"Ex11" 21L, 525C
```



The screenshot shows the same Linux desktop environment. The terminal window is now showing the output of the script being executed multiple times. The user has entered guesses from 1 to 11, and the script has provided feedback for each guess. The secret number is 18, so the feedback for guesses 1 through 10 is "The secret number is larger than your guess. Try again!". The feedback for guess 11 is "The secret number is smaller than your guess. Try again!".

```
[admin@Linux lab4]$ ./Ex11
I am thinking of a number between 1 and 100. Enter your guess: 1
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 2
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 3
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 4
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 5
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 6
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 7
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 8
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 9
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 10
Please enter a number:
I am thinking of a number between 1 and 100. Enter your guess: 11
Please enter a number:
```

