

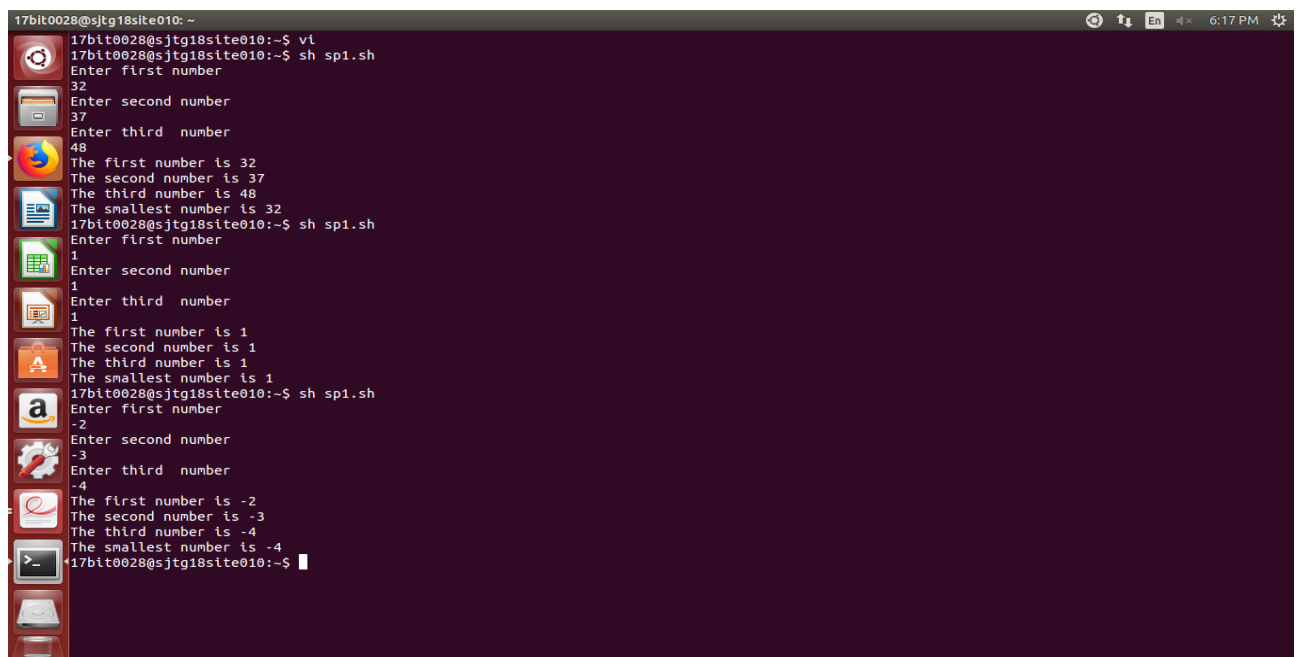
SCHOOL OF INFORMATION TECHNOLOGY AND ENGINEERING
B.Tech IT
OPERATING SYSTEMS

17BIT0028
SIDDHI SINGH

Shell Programs

Shell Program 1

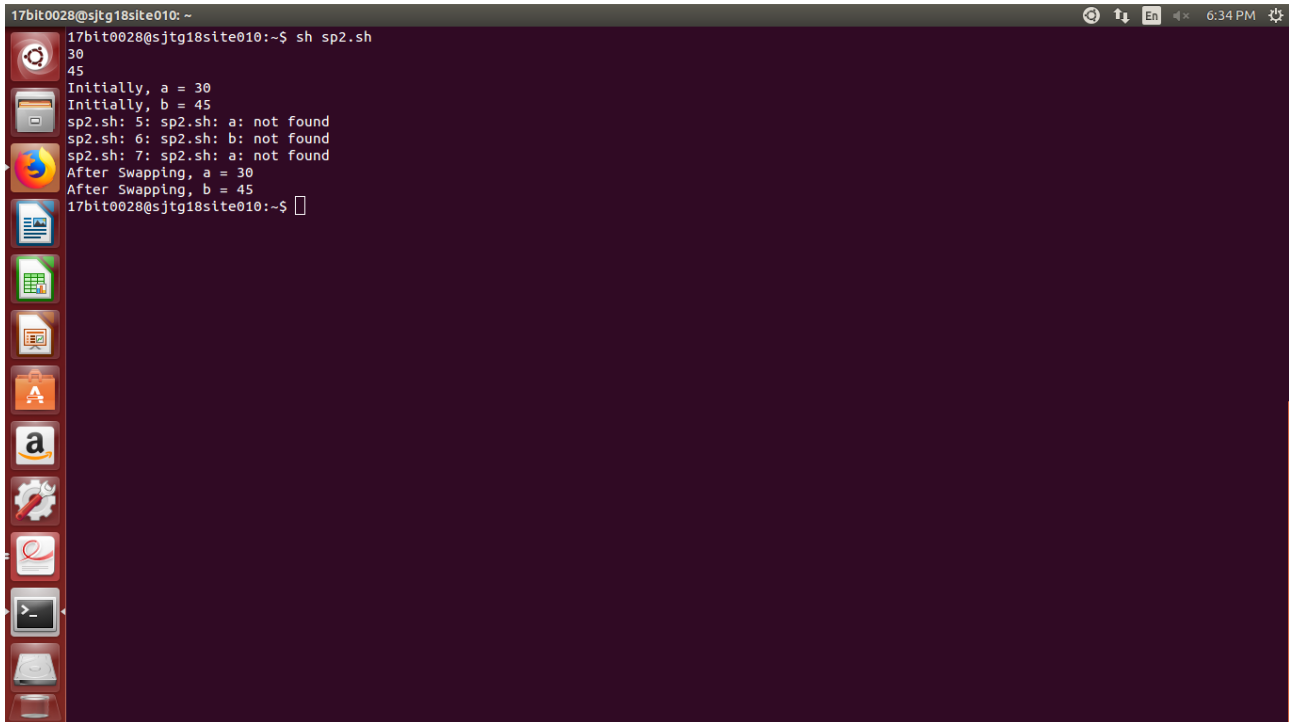
```
echo "Enter 1st numbner"
read a
echo "Enter 2nd number "
read b
echo "Enter 3rd number "
read c
echo "the 1st number is $a"
echo "the 2nd number is $b"
echo "the 3rd number is $c"
if [ $a -lt $b ]
then d=$a
else d=$b
fi
if [ $c -lt $d ]
then d=$c
fi
echo "The smallest number is $d"
```



```
17bit0028@sjtg18site010: ~
17bit0028@sjtg18site010:~$ vi
17bit0028@sjtg18site010:~$ sh sp1.sh
Enter first number
32
Enter second number
37
Enter third number
48
The first number is 32
The second number is 37
The third number is 48
The smallest number is 32
17bit0028@sjtg18site010:~$ sh sp1.sh
Enter first number
1
Enter second number
1
Enter third number
1
The first number is 1
The second number is 1
The third number is 1
The smallest number is 1
17bit0028@sjtg18site010:~$ sh sp1.sh
Enter first number
-2
Enter second number
-3
Enter third number
-4
The first number is -2
The second number is -3
The third number is -4
The smallest number is -4
17bit0028@sjtg18site010:~$
```

Shell Program 2

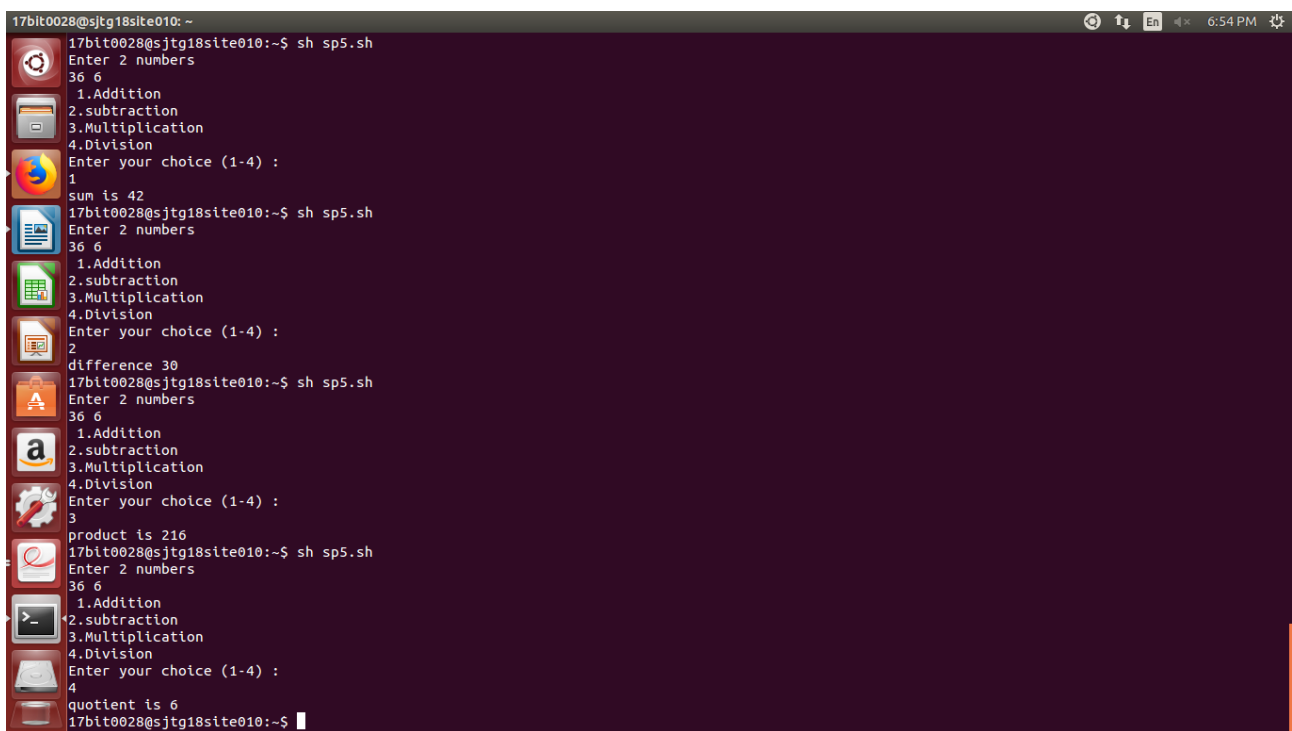
```
read a
read b
echo " Initially, a = $a "
echo " Initially, b = $b "
a=`expr $a + $b`
b=`expr $a - $b`
a=`expr $a - $b`
echo " After Swapping, a = $a "
echo " After Swapping, b = $b "
```



```
17bit0028@sjtg18site010: ~  
17bit0028@sjtg18site010:~$ sh sp2.sh  
30  
45  
Initially, a = 30  
Initially, b = 45  
sp2.sh: 5: sp2.sh: a: not found  
sp2.sh: 6: sp2.sh: b: not found  
sp2.sh: 7: sp2.sh: a: not found  
After Swapping, a = 30  
After Swapping, b = 45  
17bit0028@sjtg18site010:~$
```

Shell Program 3

```
echo Enter 2 numbers
read a b
echo " 1.Addition
2.subtraction
3.Multiplication
4.Division
Enter your choice (1-4) : "
read c
case $c in
1) echo sum is `expr $a + $b`
;;2) echo difference `expr $a - $b`
;;
3) echo product is `expr $a \* $b`
;;
4) echo quotient is `expr $a / $b`
;;
esac
```

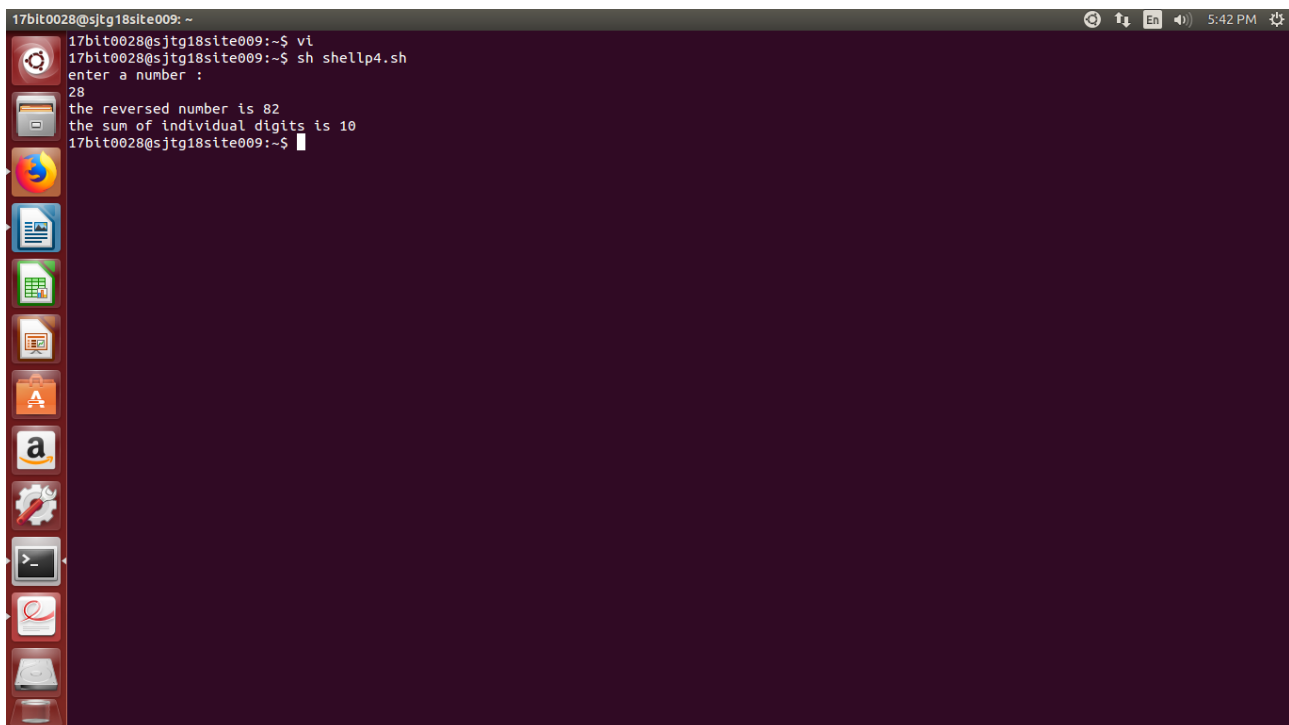


The image shows a terminal window with a dark purple background and a sidebar of application icons on the left. The terminal displays the execution of a shell script named 'sp5.sh'. The script prompts the user to enter two numbers and a choice from 1 to 4. It then performs the corresponding arithmetic operation and displays the result. The operations shown are addition (36 + 6 = 42), subtraction (36 - 6 = 30), multiplication (36 * 6 = 216), and division (36 / 6 = 6). The terminal output is as follows:

```
17bit0028@sjtg18site010: ~
17bit0028@sjtg18site010:~$ sh sp5.sh
Enter 2 numbers
36 6
 1.Addition
2.subtraction
3.Multiplication
4.Division
Enter your choice (1-4) :
1
sum is 42
17bit0028@sjtg18site010:~$ sh sp5.sh
Enter 2 numbers
36 6
 1.Addition
2.subtraction
3.Multiplication
4.Division
Enter your choice (1-4) :
2
difference 30
17bit0028@sjtg18site010:~$ sh sp5.sh
Enter 2 numbers
36 6
 1.Addition
2.subtraction
3.Multiplication
4.Division
Enter your choice (1-4) :
3
product is 216
17bit0028@sjtg18site010:~$ sh sp5.sh
Enter 2 numbers
36 6
 1.Addition
2.subtraction
3.Multiplication
4.Division
Enter your choice (1-4) :
4
quotient is 6
17bit0028@sjtg18site010:~$
```

Shell Program 4

```
echo "enter a number :"  
read n  
sum1=0  
sum=0  
while [ $n -ne 0 ]  
do  
r=`expr $n % 10`  
n=`expr $n / 10`  
sum=`expr $sum \* 10`  
sum=`expr $sum + $r`  
sum1=`expr $sum1 + $r`  
done  
echo the reversed number is $sum  
echo the sum of individual digits is $sum1
```



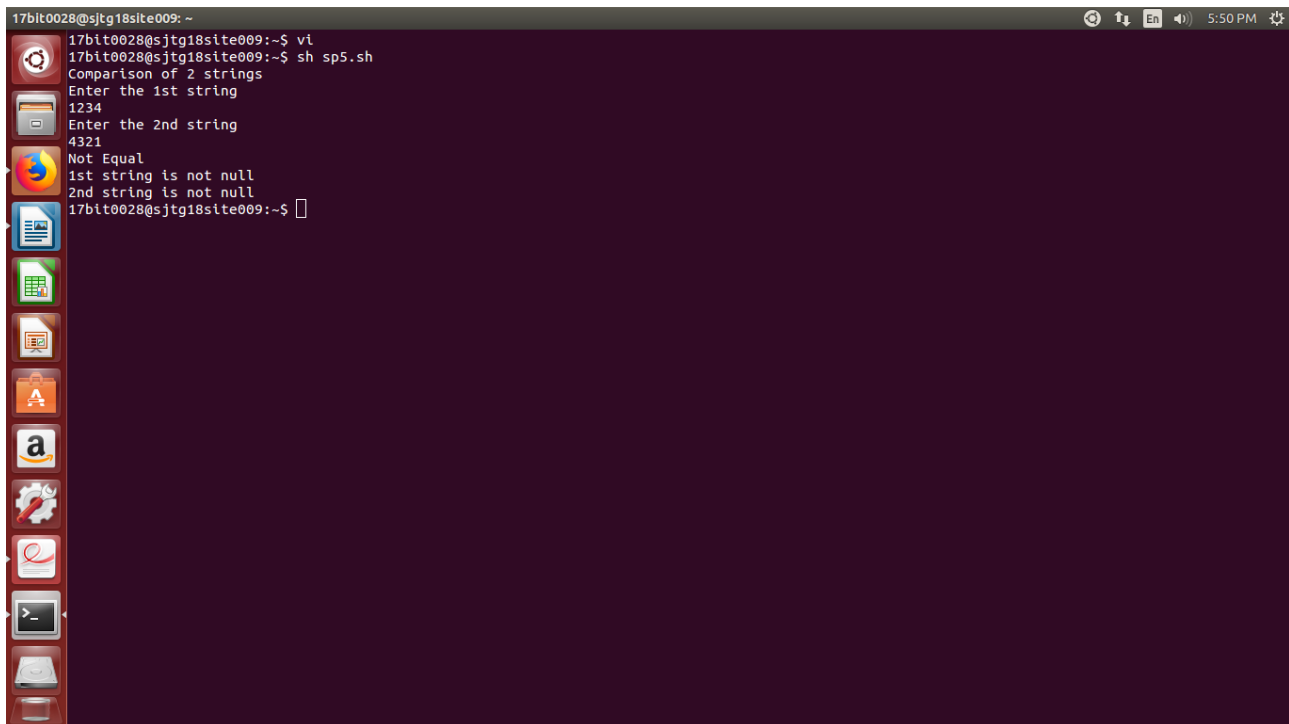
The screenshot shows a terminal window with a dark purple background and a light blue border. The window title is "17bit0028@sjtg18site009: ~". The terminal output is as follows:

```
17bit0028@sjtg18site009:~$ vi  
17bit0028@sjtg18site009:~$ sh shellp4.sh  
enter a number :  
28  
the reversed number is 82  
the sum of individual digits is 10  
17bit0028@sjtg18site009:~$
```

The terminal window has a sidebar on the left with various application icons, including a terminal, a file manager, a web browser, and a text editor. The top of the window shows system status icons and the time "5:42 PM".

Shell Program 5

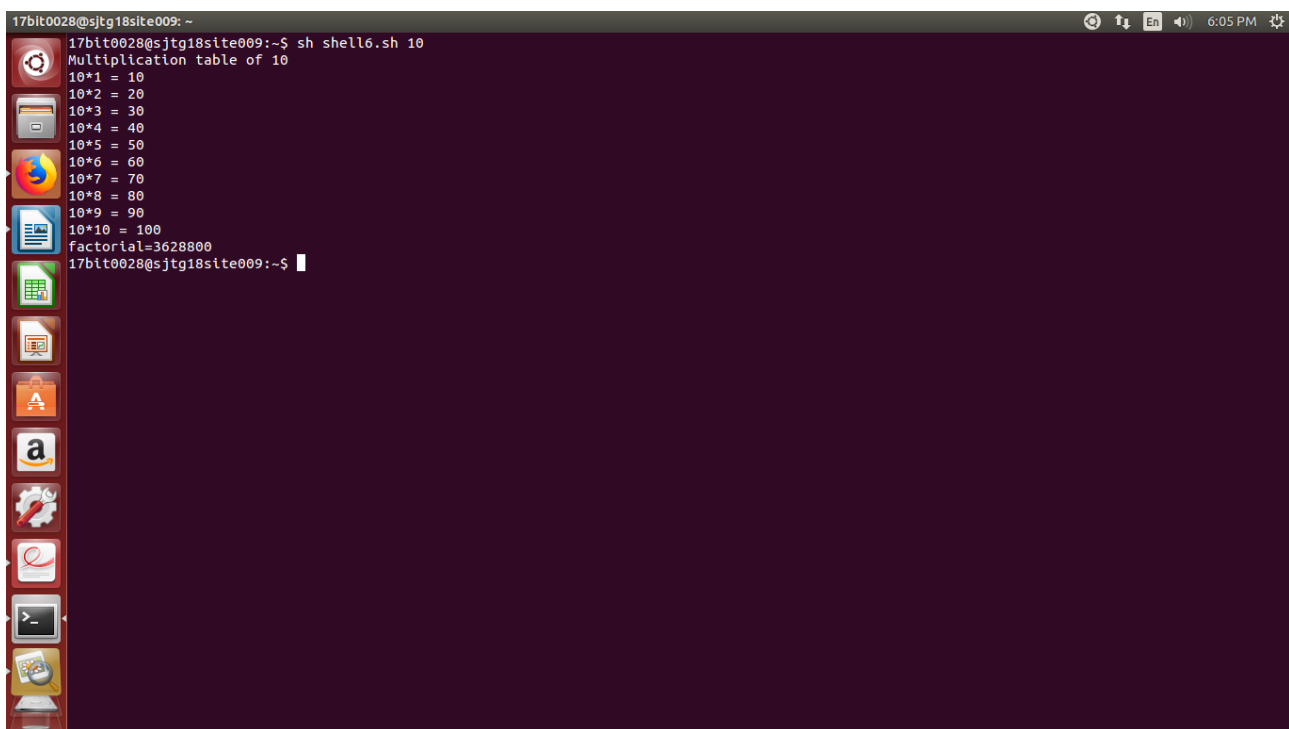
```
echo Comparison of 2 strings
echo Enter the 1st string
read s1
echo Enter the 2nd string
read s2
if [ $s1 = $s2 ]
then echo Equal
else echo Not Equal
fi
if [ -z $s1 ]
then echo 1st string is null
else echo 1st string is not null
fi
if [ -z $s2 ]
then echo 2nd string is null
else echo 2nd string is not null
fi
```

A screenshot of a terminal window with a dark purple background. The window title is "17bit0028@sjtg18site009: ~". The terminal shows the execution of a script named "sp5.sh". The script prompts for two strings, "1234" and "4321", and outputs "Not Equal", "1st string is not null", and "2nd string is not null". The left sidebar of the terminal window contains various application icons. The top status bar shows system icons and the time "5:50 PM".

```
17bit0028@sjtg18site009: ~
17bit0028@sjtg18site009:~$ vi
17bit0028@sjtg18site009:~$ sh sp5.sh
Comparison of 2 strings
Enter the 1st string
1234
Enter the 2nd string
4321
Not Equal
1st string is not null
2nd string is not null
17bit0028@sjtg18site009:~$
```

Shell Program 6

```
echo Multiplication table of $1
c=`expr $1 - 1`
for (( i=1 ; i<=10 ; i++ ))
do
echo $1*$i = `expr $1 \* $i`
done
c=1
for(( i=1 ; i<=$1 ; i++ ))
do
c=`expr $c \* $i`
done
echo factorial=$c
```



```
17bit0028@sjtg18site009: ~
17bit0028@sjtg18site009:~$ sh shell6.sh 10
Multiplication table of 10
10*1 = 10
10*2 = 20
10*3 = 30
10*4 = 40
10*5 = 50
10*6 = 60
10*7 = 70
10*8 = 80
10*9 = 90
10*10 = 100
factorial=3628800
17bit0028@sjtg18site009:~$
```

Shell Program 7

echo Reversing command line arguments

for i in \$*

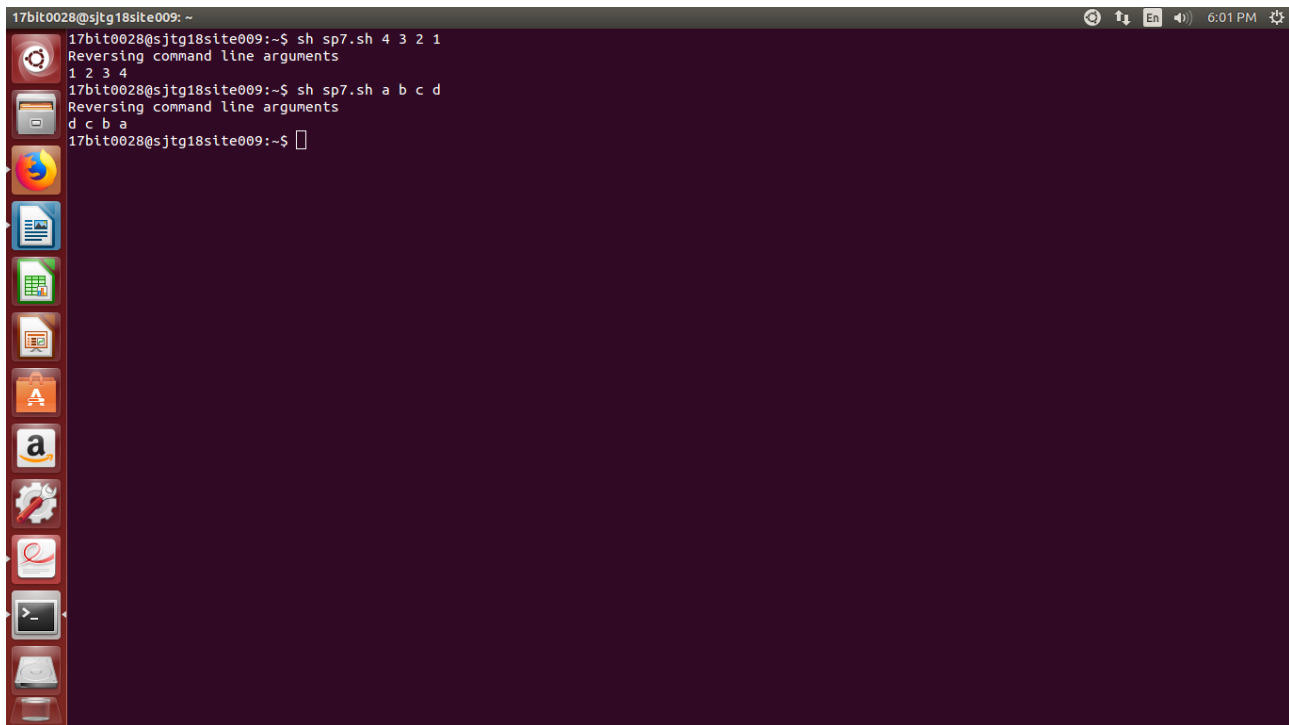
do

a=\$i

b="\$a \$b"

done

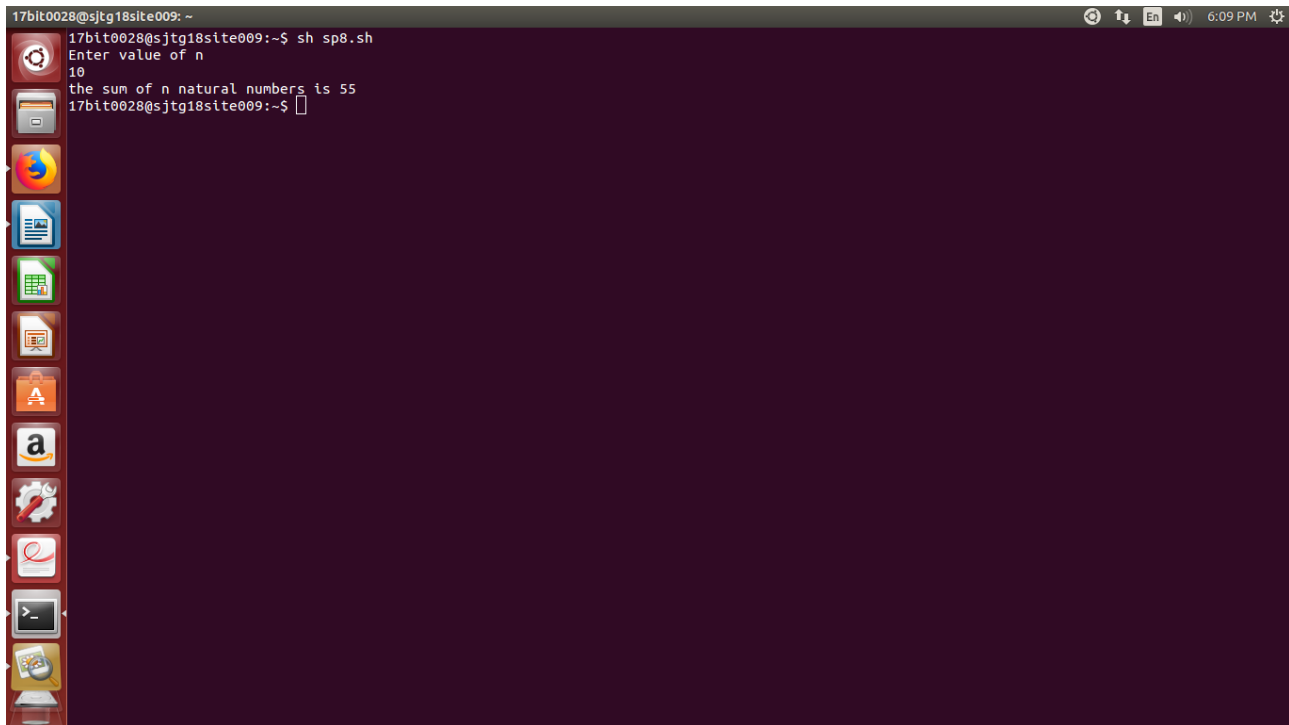
echo \$b

A terminal window with a dark purple background and a light blue title bar. The title bar contains the text "17bit0028@sjtg18site009: ~" and system icons on the right. The terminal shows the execution of a shell script named "sp7.sh". The first run with arguments "4 3 2 1" produces the output "Reversing command line arguments" followed by "1 2 3 4". The second run with arguments "a b c d" produces the output "Reversing command line arguments" followed by "d c b a". The prompt "17bit0028@sjtg18site009:~\$" is visible at the end of each command line. On the left side of the terminal window, there is a vertical dock with various application icons including a gear, a folder, a web browser, a document, a spreadsheet, a presentation, a shopping bag, an Amazon logo, a wrench and screwdriver, a red circle with a white 'e', a terminal icon, a laptop, and a smartphone.

```
17bit0028@sjtg18site009: ~  
17bit0028@sjtg18site009:~$ sh sp7.sh 4 3 2 1  
Reversing command line arguments  
1 2 3 4  
17bit0028@sjtg18site009:~$ sh sp7.sh a b c d  
Reversing command line arguments  
d c b a  
17bit0028@sjtg18site009:~$
```

Shell Program 8

```
echo Enter value of nread n
c=1
s=0
while [ $c -le $n ]
do
s=`expr $s + $c`
c=`expr $c + 1`
done
echo "the sum of n natural numbers is $s"
```

A screenshot of a Linux desktop environment with a dark purple background. On the left side, there is a vertical dock containing several application icons: a red circular icon, a file manager icon, a Firefox browser icon, a LibreOffice Writer icon, a LibreOffice Calc icon, a LibreOffice Impress icon, an Amazon logo, a gear icon, a red circular icon, a terminal icon, and a game controller icon. The terminal window is open, showing the command prompt '17bit0028@sjtg18site009: ~'. The user has entered 'sh sp8.sh', and the terminal displays the output of the script: 'Enter value of n', '10', and 'the sum of n natural numbers is 55'. The terminal window has a title bar with standard Linux window controls and a system tray on the right showing the time as 6:09 PM.

```
17bit0028@sjtg18site009: ~
17bit0028@sjtg18site009:~$ sh sp8.sh
Enter value of n
10
the sum of n natural numbers is 55
17bit0028@sjtg18site009:~$
```


PROCESSES

```
#include <unistd.h>
#include <sys/types.h>
#include <errno.h>
#include <stdio.h>
#include <sys/wait.h>
#include <stdlib.h>

int var_glb; /* A global variable*/

int main(void)
{
    pid_t childPID;
    int var_lcl = 0;

    childPID = fork();

    if(childPID >= 0) // fork was successful

    {
        if(childPID == 0) // child process
        {
            var_lcl++;
            var_glb++;
            printf("\n Child Process :: var_lcl = [%d], var_glb[%d]\n", var_lcl, var_glb);
        }
        else //Parent process
        {
            var_lcl = 10;
            var_glb = 20;
            printf("\n Parent process :: var_lcl = [%d], var_glb[%d]\n", var_lcl, var_glb);
        }
    }
    else // fork failed
    {
        printf("\n Fork failed, quitting!!!!!!\n");
        return 1;
    }
    return 0;
}
```

```
17bit0028@sjtg18site009: ~  
17bit0028@sjtg18site009:~$ cc parent.c  
17bit0028@sjtg18site009:~$ ./a.out  
Parent process :: var_lcl = [10], var_glb[20]  
Child Process :: var_lcl = [1], var_glb[1]  
17bit0028@sjtg18site009:~$
```