

```
#program 1

#!/bin/bash

valid_username="myusername"
valid_password="mypassword"

read -p "Enter username: " username
read -p "Enter password: " password
echo
if [ "$username" == "$valid_username" ] && [ "$password" == "$valid_password" ];then
echo "Valid username and password."
else
echo "Invalid username and password."
fi
```

```
#!/bin/bash
```

```
a=10
```

```
b=20
```

```
x="hello"
```

```
y="world"
```

```
echo "a+b: $((\$a+\$b))"
```

```
echo "a-b: $((\$a-\$b))"
```

```
echo "a%b: $((\$a\$\$b))"
```

```
echo "a/b: $((\$a/\$b))"
```

```
c=$x$y
```

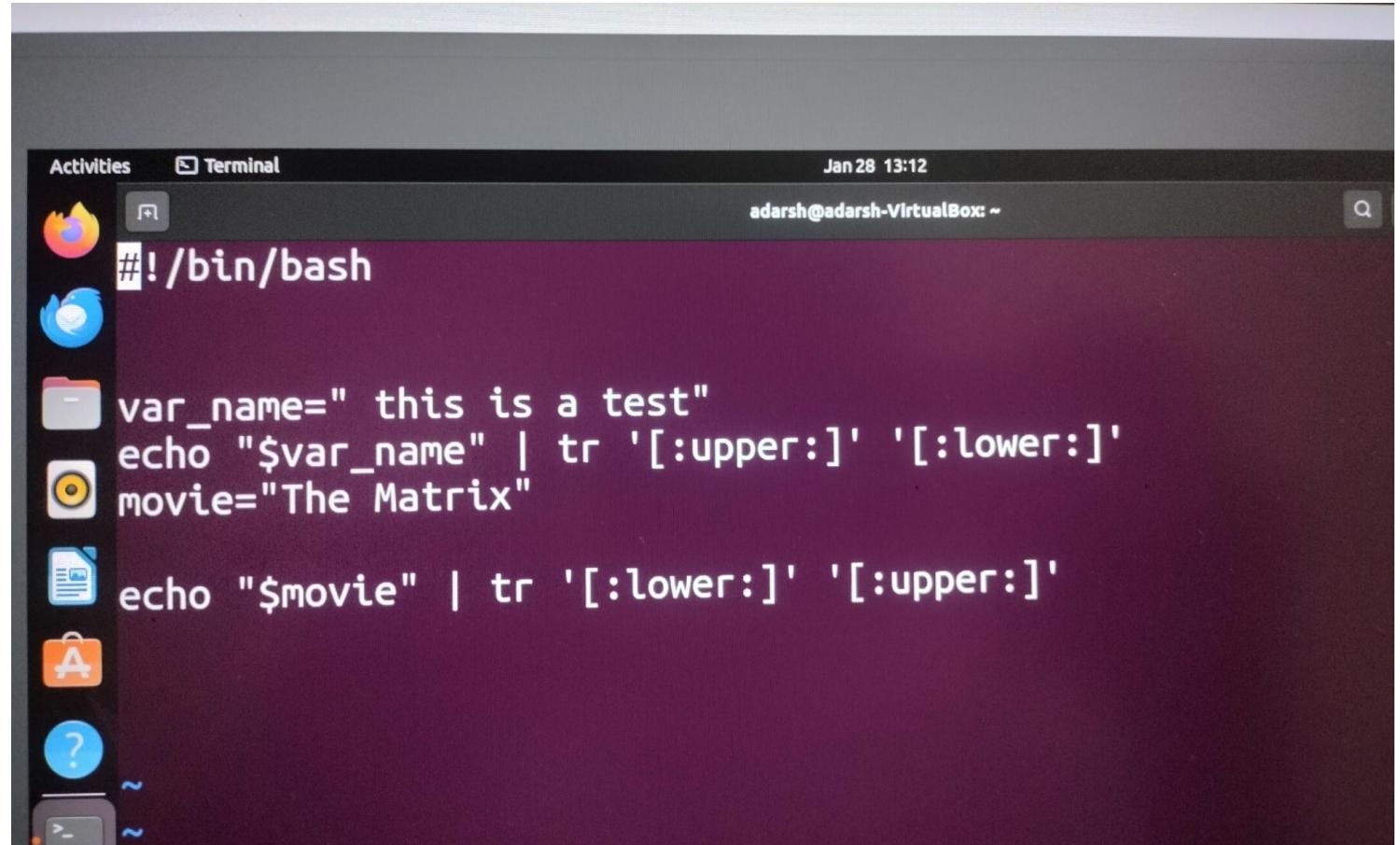
```
echo \$c
```

```
echo " a is equal to b"
```

```
else
```

```
echo " a is not equal to b"
```

```
fi
```

A screenshot of an Ubuntu desktop environment. The terminal window is open and shows the following command-line session:

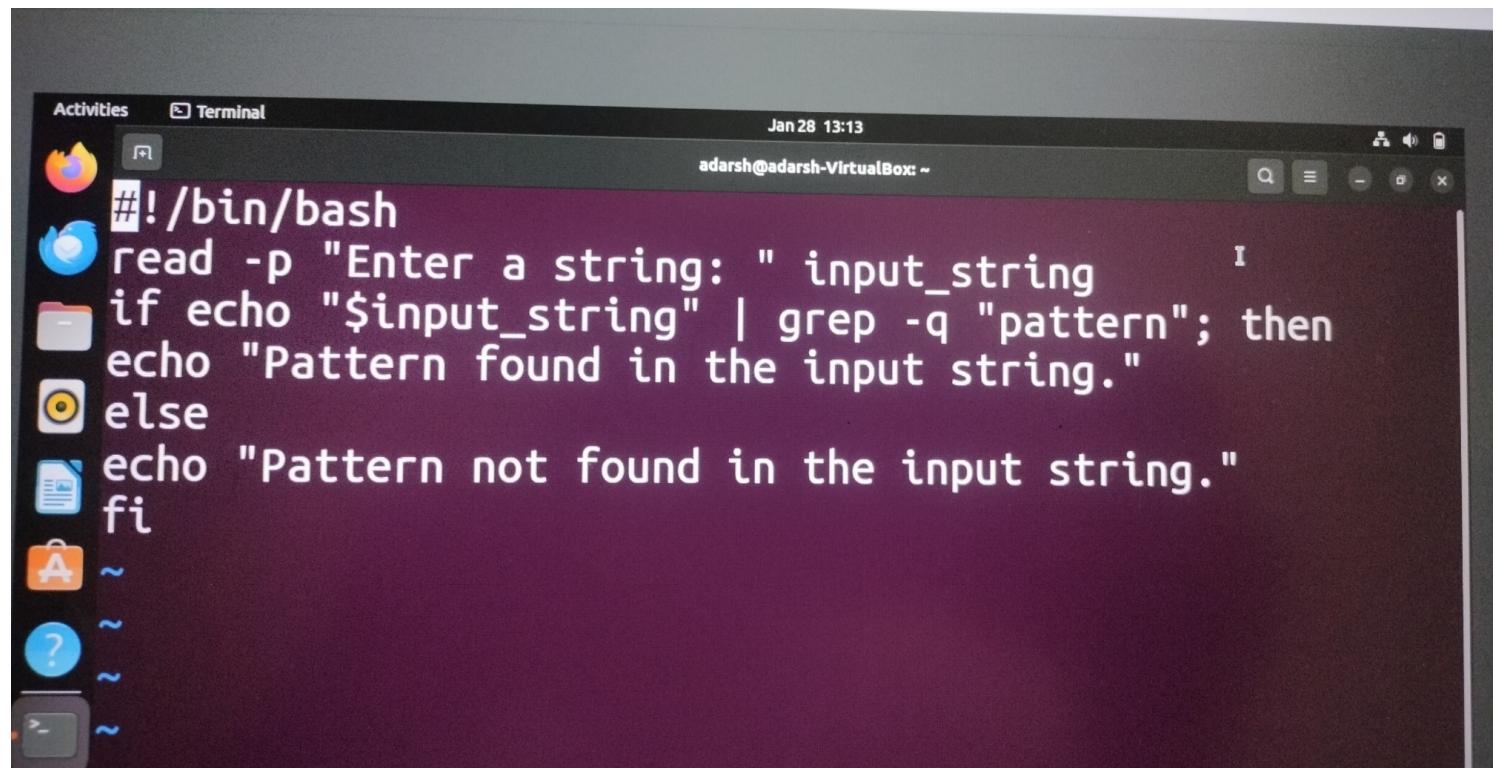
```
#!/bin/bash
var_name=" this is a test"
echo "$var_name" | tr '[:upper:]' '[:lower:]'
movie="The Matrix"

echo "$movie" | tr '[:lower:]' '[:upper:]'
```

The terminal window has a dark purple background. The top bar shows "Activities" and "Terminal" icons, the date "Jan 28 13:12", and the user "adarsh@adarsh-VirtualBox: ~". The bottom of the terminal window shows two tilde symbols (~) indicating the end of the command history.

Activities Terminal Jan 28 13:12 adarsh@adarsh-VirtualBox: ~

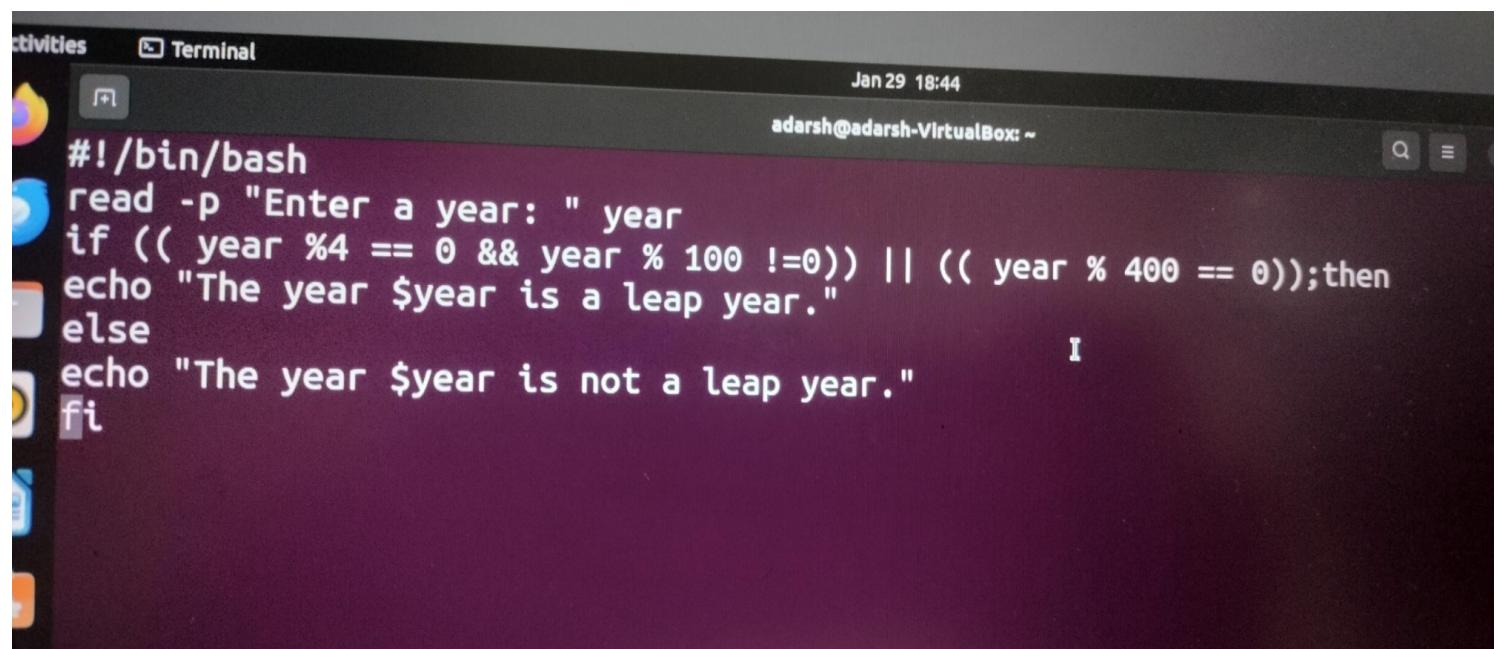
```
#!/bin/bash
read -p "Enter a file path: " file_path
if [ -d "$file_path" ]; then
echo "The file is a directory."
else
echo "The file is not a directory."
fi
~
```

A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window is titled 'Terminal' and has the command 'ls' running. The background shows the Unity interface with various icons in the dock and a file manager window. The terminal output is as follows:

```
Activities Terminal Jan 28 13:13 adarsh@adarsh-VirtualBox: ~
#!/bin/bash
read -p "Enter a string: " input_string
if echo "$input_string" | grep -q "pattern"; then
echo "Pattern found in the input string."
else
echo "Pattern not found in the input string."
fi
~
```

Activities Terminal Jan 29 18:43  
adarsh@adarsh-VirtualBox: ~

```
#!/bin/bash
args=("$@")
num_args=$#
for((i=num_args-1;i>=0;i--)); do
echo "${args[$i]}"
done
```

A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window is titled 'Terminal' and has a dark background. The command line shows a bash script for determining leap years. The script reads a year from the user, checks if it's divisible by 4 but not by 100, or if it's divisible by 400, and then prints a message indicating whether it's a leap year or not.

```
#!/bin/bash
read -p "Enter a year: " year
if (( year %4 == 0 && year % 100 !=0)) || (( year % 400 == 0));then
echo "The year $year is a leap year."
else
echo "The year $year is not a leap year."
fi
```

```
#!/bin/bash
echo "Enter first number."
read n1
echo "Enter second number."
read n2
m=$n1
n=$n2
r=$n2
while [ $r -ne 0 ];do
    r=$(( n1%n2 ))
    if [ $r -eq 0 ];then
        break
    else
        ((n1=$n2))
        ((n2=$r))
    fi
done

echo "GCD of %d and %d is %d \n" $m $n $r
echo "LCM of %d and %d is %d \n" $m $n $(((m*n)/r))
```

```
#!/bin/bash
# function to check if a number is prime

is_prime() {
    number=$1
    if((number<2));then
        return 1
    fi

    for((i=2;i*i<=number;i++));do

        if((number %i == 0));then
            return 1
        fi
    done
    return 0
}
read -p "Enter a number: " input_number

if is_prime "$input_number"; then
    echo "$input_number is a prime number."
else
    echo "$input_number is not a prime number."
fi
```

```
#!/bin/bash
read -p "Enter a string: " input_string

clean_string=$(echo "$input_string" | tr -dc '[:alnum:]' | tr '[:upper:]' '[:lower:]')

reverse_string=$(echo "$clean_string" | rev)
if [ "$clean_string" = "$reverse_string" ]; then
echo "The string '$input_string' is a palindrome."
else
echo "The string '$input_string' is not a palindrome."
fi
~
```