



1. Write a script called mycase, using the case utility to check the type of character entered by a user:
 - a. Upper Case.
 - b. Lower Case.
 - c. Number.
 - d. Nothing.

```
#!/bin/bash
echo "Enter a character: "
read c

case $c in
  [A-Z])
    echo "Upper Case"
    ;;
  [a-z])
    echo "Lower Case"
    ;;
  [0-9])
    echo "Number"
    ;;
  *)
    echo "Nothing"
    ;;
esac
```

```
nardine@nardine-VirtualBox:~$ vi mycase.sh
nardine@nardine-VirtualBox:~$ chmod +x mycase.sh
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a character:
n
Lower Case
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a character:
M
Upper Case
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a character:
2
Number
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a character:
*
Nothing
nardine@nardine-VirtualBox:~$
```

2. Enhanced the previous script, by checking the type of string entered by a user:
 - a. Upper Cases.
 - b. Lower Cases.
 - c. Numbers.
 - d. Mix.
 - e. Nothing.

```
#!/bin/bash
echo -n "Enter a string: "
read string
case "$string" in
  [A-Z]*)
    if [[ "$string" =~ ^[A-Z]+$ ]]; then
      echo "All Upper Case"
    else
      echo "Mix"
    fi
    ;;
  [a-z]*)
    if [[ "$string" =~ ^[a-z]+$ ]]; then
      echo "All Lower Case"
    else
      echo "Mix"
    fi
    ;;
  [0-9]*)
    if [[ "$string" =~ ^[0-9]+$ ]]; then
      echo "All Numbers"
    else
      echo "Mix"
    fi
    ;;
  *)
    echo "Nothing"
    ;;
esac
```

```
nardine@nardine-VirtualBox:~$ vi mycase.sh
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a string: NARDINE
All Upper Case
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a string: nardine
All Lower Case
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a string: 12345
All Numbers
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a string: NArDine123
Mix
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a string: NARDINE123
Mix
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a string: nardine123
Mix
nardine@nardine-VirtualBox:~$ ./mycase.sh
Enter a string: +*/
Nothing
nardine@nardine-VirtualBox:~$
```

3. Write a script called mychmod using for utility to give execute permission to all files and directories in your home directory.

```
nardine@nardine-VirtualBox:~$ vi mychmod.sh
nardine@nardine-VirtualBox:~$ chmod +x mychmod.sh
nardine@nardine-VirtualBox:~$ ./mychmod.sh
Execute permission added to dead.letter
Execute permission added to Desktop
Execute permission added to Documents
Execute permission added to Downloads
Execute permission added to Music
Execute permission added to mycase.sh
Execute permission added to mychmod.sh
Execute permission added to Pictures
Execute permission added to Public
Execute permission added to snap
Execute permission added to Templates
Execute permission added to Videos
nardine@nardine-VirtualBox:~$
```

```
#!/bin/bash
cd ~
for name in *
do
    if [ -f "$name" ] || [ -d "$name" ]; then
        chmod +x "$name"
        echo "Execute permission added to $name"
    fi
done
~
```

```
nardine@nardine-VirtualBox:~$ ls -l
total 48
-rwx--x--x 1 nardine nardine 175 Nov 19 14:55 dead.letter
drwxr-xr-x 2 nardine nardine 4096 Nov 13 13:47 Desktop
drwxr-xr-x 2 nardine nardine 4096 Nov 13 13:47 Documents
drwxr-xr-x 2 nardine nardine 4096 Nov 13 13:47 Downloads
drwxr-xr-x 2 nardine nardine 4096 Nov 13 13:47 Music
-rwxrwxr-x 1 nardine nardine 559 Dec 12 13:33 mycase.sh
-rwxrwxr-x 1 nardine nardine 167 Dec 12 13:41 mychmod.sh
drwxr-xr-x 2 nardine nardine 4096 Nov 13 13:47 Pictures
drwxr-xr-x 2 nardine nardine 4096 Nov 13 13:47 Public
drwx--x--x 3 nardine nardine 4096 Nov 13 13:47 snap
drwxr-xr-x 2 nardine nardine 4096 Nov 13 13:47 Templates
drwxr-xr-x 2 nardine nardine 4096 Nov 13 13:47 Videos
nardine@nardine-VirtualBox:~$
```

4. Write a script called mybackup using for utility to create a backup of only files in your home directory.

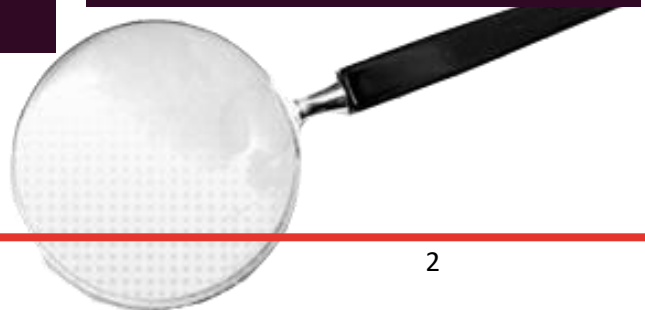
```
nardine@nardine-VirtualBox:~$ vi mybackup.sh
nardine@nardine-VirtualBox:~$ chmod +x mybackup.sh
nardine@nardine-VirtualBox:~$ ./mybackup.sh
Backup created for file dead.letter
Backup created for file mybackup.sh
Backup created for file mycase.sh
Backup created for file mychmod.sh
nardine@nardine-VirtualBox:~$ ls -R
.:
Backup dead.letter Desktop Documents Downloads Music mybackup.sh mycase.sh
mychmod.sh Pictures Public snap Templates Videos

./Backup:
dead.letter.copy mybackup.sh.copy mycase.sh.copy mychmod.sh.copy

./Desktop:

./Documents:
```

```
#!/bin/bash
cd ~
mkdir ~/Backup
for name in *
do
    if [ -f $name ];
    then
        cp $name ./Backup/$name.copy
        echo "Backup created for file $name"
    fi
done
~
~
```



5. Write a script called mymail using for utility to send a mail to all users in the system.

Note: write the mail body in a file called mtemplate.

```
nardine@nardine-VirtualBox:~$ vi mtemplate
nardine@nardine-VirtualBox:~$ vi mymail.sh
nardine@nardine-VirtualBox:~$ chmod +x mymail.sh
nardine@nardine-VirtualBox:~$ ./mymail.sh
```

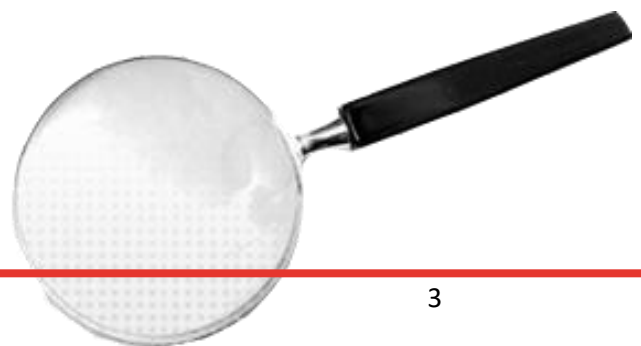
```
Mail sent to root
Mail sent to daemon
Mail sent to bin
Mail sent to sys
Mail sent to sync
Mail sent to games
Mail sent to man
Mail sent to lp
Mail sent to mail
Mail sent to news
Mail sent to uuco
```

```
#!/bin/bash
for user in $(awk -F: '{print $1}' /etc/passwd)
do
    mailx $user < mtemplate
    echo "Mail sent to $user"
done
~
```

```
"Hello from Admin"
~
```

```
nardine@nardine-VirtualBox:~$ mailx
"/var/mail/nardine": 3 messages 3 new
>N 1 Nardine William Tue Dec 12 14:21 13/473
N 2 Nardine William Tue Dec 12 14:23 13/473
N 3 Nardine William Tue Dec 12 14:28 13/468
? 3
Return-Path: <nardine@nardine-VirtualBox>
X-Original-To: nardine
Delivered-To: nardine@nardine-VirtualBox.com
Received: by nardine-VirtualBox (Postfix, from userid 1000)
        id 92F9E149E5F; Tue, 12 Dec 2023 14:28:13 +0200 (EET)
To: nardine@nardine-VirtualBox.com
User-Agent: mail (GNU Mailutils 3.14)
Date: Tue, 12 Dec 2023 14:28:13 +0200
Message-Id: <20231212122813.92F9E149E5F@nardine-VirtualBox>
From: Nardine William <nardine@nardine-VirtualBox>

"Hello from Admin"
```



6. Write a script called chkmail to check for new mails every 10 seconds. Note: mails are saved in /var/mail/username.

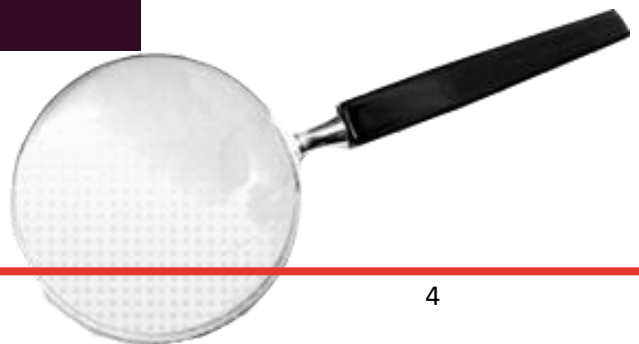
Bonus:

Open a talk session to a certain user when she/he logs into the system.

```
#!/bin/bash
while true;
do
    if [ -s /var/mail/nardine ];
    then
        echo "New mail"
    else
        echo "No new mail."
    fi
    sleep 10
done
```

```
nardine@nardine-VirtualBox:~$ vi chkmail.sh
nardine@nardine-VirtualBox:~$ chmod +x chkmail.sh
nardine@nardine-VirtualBox:~$ mailx
"/var/mail/nardine": 2 messages 2 unread
>U  1 Nardine William    Tue Dec 12 14:23  16/536
  U  2 Nardine William    Tue Dec 12 14:28  15/487
? q
Held 2 messages in /var/mail/nardine
nardine@nardine-VirtualBox:~$ ./chkmail.sh
New mail
New mail
^Z
[7]+  Stopped                  ./chkmail.sh
```

```
nardine@nardine-VirtualBox:~$ mailx
No mail for nardine
nardine@nardine-VirtualBox:~$ ./chkmail.sh
No new mail.
No new mail.
^Z
[8]+  Stopped                  ./chkmail.sh
nardine@nardine-VirtualBox:~$ vi chkmail.sh
nardine@nardine-VirtualBox:~$
```



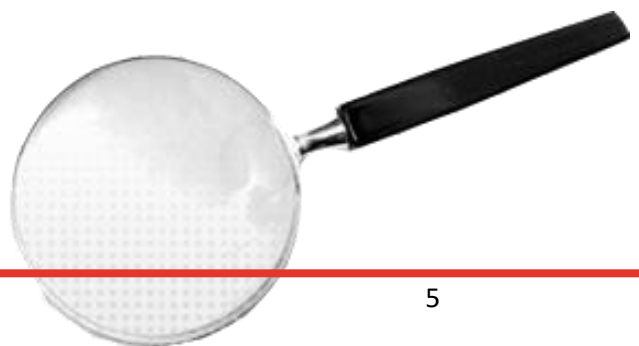
7. What is the output of the following script?

```
typeset -i n1
typeset -i n2
n1=1
n2=1
while test $n1 -eq $n2
do
    n2=$((n2+1))
    print $n1
    if [ $n1 -gt $n2 ]
    then
        break
    else
        continue
    fi
    n1=$((n1+1))
    print $n2
done
```

#1st iteration: test=true
 #2nd iteration: test=false
 #Now value of n2=2
 #1 #print on screen: 1
 #Condition=false
 #It will enter the else statement
 #Go back to while again
 #Exit while loop after only one iteration

The output that is printed on screen is:

1



8. Create the following menu:

- a. Press 1 to ls
- b. Press 2 to ls -a
- c. Press 3 to exit

Using select utility then while utility.

Using Select:

```
#!/bin/bash
PS3="Enter your choice: "
select choice in "Press 1 to ls" "Press 2 to ls -a" "Press 3 to exit"
do
case $REPLY in
1) ls
;;
2) ls -a
;;
3) exit
;;
*) echo $REPLY is not one of the choices
;;
esac
done
```

```
nardine@nardine-VirtualBox:~$ vi select.sh
nardine@nardine-VirtualBox:~$ chmod +x select.sh
nardine@nardine-VirtualBox:~$ ./select.sh
1) Press 1 to ls
2) Press 2 to ls -a
3) Press 3 to exit
Enter your choice: 1
Backup      Desktop    mbox      mybackup.sh  mymail.sh  select.sh  Videos
chkmail.sh  Documents  mtemplate mycase.sh    Pictures    snap
dead.letter Downloads  Music      mychmod.sh   Public      Templates
Enter your choice: 2
.            .local    .sudo_as_admin_successful
..           mbox      Templates
Backup       mtemplate .vboxclient-clipboard-tty2-control.pid
.bash_history Music     .vboxclient-clipboard-tty2-service.pid
.bash_logout mybackup.sh .vboxclient-draganddrop-tty2-control.pid
.bashrc      mycase.sh .vboxclient-draganddrop-tty2-service.pid
.cache       mychmod.sh .vboxclient-hostversion-tty2-control.pid
chkmail.sh   mymail.sh .vboxclient-seamless-tty2-control.pid
.config      .pam_environment .vboxclient-seamless-tty2-service.pid
dead.letter  Pictures  .vboxclient-vmvga-session-tty2-control.pid
Desktop      .profile .vboxclient-vmvga-session-tty2-service.pid
Documents    Public    Videos
Downloads    select.sh
.lessht      snap
Enter your choice: 4
4 is not one of the choices
Enter your choice: 3
nardine@nardine-VirtualBox:~$
```


Using While:

```

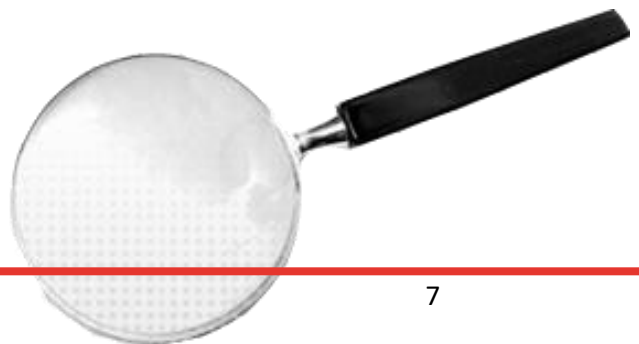
nardine@nardine-VirtualBox:~$ vi Menu.sh
nardine@nardine-VirtualBox:~$ chmod +x Menu.sh
nardine@nardine-VirtualBox:~$ ./Menu.sh
Menu:
Press 1 to ls
Press 2 to ls -a
Press 3 to exit
Enter your choice: 1
Backup      Documents  mtemplate  mychmod.sh  select.sh
chkmail.sh  Downloads  Music      mymail.sh   snap
dead.letter mbox       mybackup.sh Pictures     Templates
Desktop     Menu.sh    mycase.sh  Public      Videos
Menu:
Press 1 to ls
Press 2 to ls -a
Press 3 to exit
Enter your choice: 2
.            .local      snap
..           mbox       .sudo_as_admin_successful
Backup       Menu.sh     Templates
.bash_history mtemplate  .vboxclient-clipboard-tty2-control.pid
.bash_logout  Music     .vboxclient-clipboard-tty2-service.pid
.bashrc       mybackup.sh .vboxclient-draganddrop-tty2-control.pid
.cache        mycase.sh  .vboxclient-draganddrop-tty2-service.pid
chkmail.sh    mychmod.sh .vboxclient-hostversion-tty2-control.pid
.config       mymail.sh  .vboxclient-seamless-tty2-control.pid
dead.letter   .pam_environment .vboxclient-seamless-tty2-service.pid
Desktop       Pictures   .vboxclient-vmtoolsd-session-tty2-control.pid
Documents     .profile  .vboxclient-vmtoolsd-session-tty2-service.pid
Downloads     Public    Videos
.lessshst     select.sh
Menu:
Press 1 to ls
Press 2 to ls -a
Press 3 to exit
Enter your choice: 5
5 is not one of the choices
Menu:
Press 1 to ls
Press 2 to ls -a
Press 3 to exit
Enter your choice: 3
nardine@nardine-VirtualBox:~$

```

```

#!/bin/bash
while true;
do
echo "Menu:"
echo "Press 1 to ls"
echo "Press 2 to ls -a"
echo "Press 3 to exit"
read -p "Enter your choice: " choice
case $choice in
1) ls
;;
2) ls -a
;;
3) exit
;;
*)
echo "$choice is not one of the choices"
;;
esac
done

```



9. Write a script called myarr that ask a user how many elements he wants to enter in an array, fill the array and then print it.

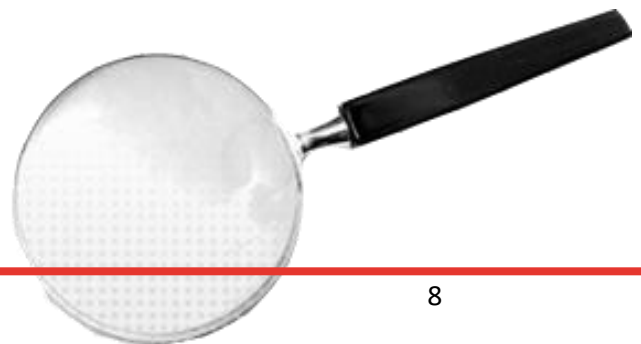
```
#!/bin/bash
read -p "Enter the number of elements: " num
if ! [[ $num =~ ^[0-9]+$ ]]; then
    echo "Invalid input"
    exit 1
fi
array=()
for ((i = 0; i < num; i++));
do
    read -p "Enter element $((i + 1)): " element
    array+=("$element")
done
echo "Array= ${array[@]}"
~
~
```

```
nardine@nardine-VirtualBox:~$ vi myarr
nardine@nardine-VirtualBox:~$ chmod +x myarr
nardine@nardine-VirtualBox:~$ ./myarr
Enter the number of elements: 5
Enter element 1: 4
Enter element 2: 6
Enter element 3: 2
Enter element 4: 1
Enter element 5: 8
Array= 4 6 2 1 8
```

10. Write a script called myavg that calculate average of all numbers entered by a user.
Note: use arrays

```
#!/bin/bash
read -p "Enter the number of elements: " num
if ! [[ $num =~ ^[1-9]+$ ]]; then
    echo "Invalid input"
    exit 1
fi
array=()
for ((i = 0; i < num; i++));
do
    read -p "Enter element $((i + 1)): " element
    array+=("$element")
done
sum=0
for number in "${array[@]}";
do
    sum=$((sum + number))
done
average=$((sum / num))
echo "Average= $average"
~
```

```
nardine@nardine-VirtualBox:~$ vi myavg.sh
nardine@nardine-VirtualBox:~$ chmod +x myavg.sh
nardine@nardine-VirtualBox:~$ ./myavg.sh
Enter the number of elements: 3
Enter element 1: 1
Enter element 2: 2
Enter element 3: 3
Average= 2
nardine@nardine-VirtualBox:~$ ./myavg.sh
Enter the number of elements: 2
Enter element 1: 8
Enter element 2: 4
Average= 6
nardine@nardine-VirtualBox:~$ ./myavg.sh
Enter the number of elements: n
Invalid input
nardine@nardine-VirtualBox:~$ ./myavg.sh
Enter the number of elements: 0
Invalid input
nardine@nardine-VirtualBox:~$
```



11. Write a function called `mysq` that calculate square if its argument.

```
#!/bin/bash
mysq() {
    local num=$1
    local sq=$((num * num))
    echo "Square of $num = $sq"
}

read -p "Enter a number: " num
mysq "$num"
~
```

```
nardine@nardine-VirtualBox:~$ vi mysql.sh
nardine@nardine-VirtualBox:~$ chmod +x mysql.sh
nardine@nardine-VirtualBox:~$ ./mysql.sh
Enter a number: 2
Square of 2 = 4
nardine@nardine-VirtualBox:~$ ./mysql.sh
Enter a number: 3
Square of 3 = 9
nardine@nardine-VirtualBox:~$
```

