Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute of Technology
(An Autonomous Institute affiliated to Savitribai
Phule Pune University)

Operating System Lab

Assignment No. - 2

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Roll No : 21

Problem :

Shell Programming

1. Basic Arithmetic Operations
2. Control Statements
3. Looping
4. Command Line Argument
5. Functions
6. Array
7. String Operations

1. Basic Arithmetic Operations

Addition, Subtraction, Multiplication, Module, Division

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> cat basic_arithmatics.sh
#!/bin/bash

echo "Hello World";
echo -e "Enter the value of the a: \c"
read a
echo -e "Enter the value of the b: \c"
read b

echo "Addition: $(($a+$b))"
echo "Subtraction: $(($a-$b))"
echo "Multiplication: $(($a*$b))"
echo "Division: $(($a/$b))"
echo "Module: $(($a%$b))"

kali@kali ~/D/g/V/O/Assignment-2 (main)> ./basic_arithmatics.sh
Hello World
Enter the value of the a: 10
Enter the value of the b: 5
Addition: 15
Subtraction: 5
Multiplication: 50
Division: 2
Module: 0
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./basic_arithmatics.sh
Hello World
Enter the value of the a: 20
Enter the value of the b: 4
Addition: 24
Subtraction: 16
Multiplication: 80
Division: 5
Module: 0
kali@kali ~/D/g/V/O/Assignment-2 (main)>
```

2. Control Statement

If-else : Even and Odd

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> cat control-statement.sh
#!/bin/bash

echo -e "Enter a number: \c"
read a

if [ $((a % 2)) -eq 0 ];
then
    echo "$a is a even number"
else
    echo "$a is a odd number"
fi



kali@kali ~/D/g/V/O/Assignment-2 (main)> ./control-statement.sh
Enter a number: 10
10 is a even number
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./control-statement.sh
Enter a number: 3
3 is a odd number
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./control-statement.sh
Enter a number: 42352
42352 is a even number
kali@kali ~/D/g/V/O/Assignment-2 (main)>
```

Switch Case

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> cat switch_case.sh
#!/bin/bash

echo "Switch Case"
echo -e "Enter a number between 1-5: \c"
read n

case $n in
1)
    echo "You entered 1"
    ;;
2)
    echo "You entered 2"
    ;;
3)
    echo "You entered 3"
    ;;
4)
    echo "You entered 4"
    ;;
5)
    echo "You entered 5"
    ;;
esac
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./switch_case.sh
Switch Case
Enter a number between 1-5: 5
You entered 5
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./switch_case.sh
Switch Case
Enter a number between 1-5: 3
You entered 3
```

3. Looping

Use of While loop and For loop

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> cat looping.sh
#!/bin/bash

echo -e "For Loop: \c"
n=$1
for((i=0;i<n;i++))
do
  echo -e "$i \c"
done

echo -e "\nWhile Loop: \c"
n=$1
i=0
while [ $i -ne $n ]
do
  echo -e "$i \c"
  i=$(($i + 1))
done
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./looping.sh 10
For Loop: 0 1 2 3 4 5 6 7 8 9
While Loop: 0 1 2 3 4 5 6 7 8 9 ⏎
```

Fibonacci Series using for loop

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> cat fibonaaci.sh
#!/bin/bash

echo "Fibonaaci Series"
a=0
b=1
n=$1
for((i=0;i<n;i++))
do
  c=$(($a+$b))
  a=$b
  b=$c
  echo $c
done

kali@kali ~/D/g/V/O/Assignment-2 (main)> ./fibonaaci.sh 7
Fibonaaci Series
1
2
3
5
8
13
21
```

4. Command Line Argument

Addition of numbers

```
kali@kali ~/D/g/V/O/Assignment-2 (main) [1]> cat argument.sh
#!/bin/bash

n=$#
i=0
for i in "$@"
do
  sum=$(($sum+$i))
done

echo $sum

kali@kali ~/D/g/V/O/Assignment-2 (main)> ./argument.sh 10 39 74 28 27 38
216
```

Palindrome

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> cat palindrome.sh
#!/bin/bash

n=$1
a=$1
reverse=0
while [ $n -ne 0 ]
do
    remainder=$((n%10))
    reverse=$(($reverse*10+$remainder))
    n=$((n/10))
done

if(($a == $reverse))
then
  echo "$a is a Palindrome"
else
  echo "$a is Not a Palindrome"
fi
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./palindrome.sh 1234567654321
1234567654321 is a Palindrome
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./palindrome.sh 1234
1234 is Not a Palindrome
```

5. Functions

Factorial of a number using function

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> cat function1.sh
#!/bin/bash

function factorial (){
  x=$1
  fact=1
  for((i=1;i<=$x;i++))
  do
    fact=`expr $fact \* $i`
  done

  echo "Factorial of $x is $fact"
}

echo -e "Factorial Number: \c"
read a

factorial a
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./function1.sh
Factorial Number: 5
Factorial of a is 120
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./function1.sh
Factorial Number: 30
Factorial of a is 265252859812191058636308480000000
```

6. Array

Taking array as input from user and performing insertion, deletion and display operations

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> cat array1.sh
#!/bin/bash

val () {
  value=$1
  for i in "${value[@]}";
  do
    echo "$i";
  done
}

echo -e "Enter the list of array: \c"
read -a data
total=${#data[@]}
for i in "${data[@]}";
do
  echo "$i";
done
echo -e "For Insertion enter element: \c"
read e

data[total++]=$e
for i in "${data[@]}";
do
  echo "$i";
done

echo -e "Enter position for deletion of element: \c"
read d

unset data[--d]
for i in "${data[@]}";
do
  echo "$i";
done
```

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> ./array1.sh
Enter the list of array: 59 37 92 04 38 20 47 32
59
37
92
04
38
20
47
32
For Insertion enter element: 432
59
37
92
04
38
20
47
32
432
Enter position for deletion of element: 4
59
37
92
38
20
47
32
432
```

7. String Operation

String concatenation, length, uppercase to lowercase, lowercase to uppercase and slicing

```
kali@kali ~/D/g/V/O/Assignment-2 (main)> cat string.sh
#!/bin/bash

string="Hello World "
string2="Welcome to Shell Programming"
length=`expr length "$string"`
echo "String 1 = $string"
echo "String 2 = $string2"
echo "Length of the String1 = `expr length "$string"`"
echo "Length of the String2 = `expr length "$string2"`"
echo "Concat: $string$string2"
echo "Lowercase: ${string,,} ${string2,,}"
echo "Uppercase: ${string^^} ${string2^^}"
echo "Slicing: ${string:0:5} ${string2:11:20}"



kali@kali ~/D/g/V/O/Assignment-2 (main)> ./string.sh
String 1 = Hello World
String 2 = Welcome to Shell Programming
Length of the String1 = 12
Length of the String2 = 28
Concat: Hello World Welcome to Shell Programming
Lowercase: hello world  welcome to shell programming
Uppercase: HELLO WORLD  WELCOME TO SHELL PROGRAMMING
Slicing: Hello Shell Programming
```