

Lab 4

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23BCP203

D3 – G6

OS Lab

Title: Introduction to shell scripting with functions and command line arguments.

Task: Write a below listed shell scrips

- ✚ Write a shell script and create functions to find the largest of three numbers and also find the total average.

```
kali@kali: ~/OSLab
File Actions Edit View Help
GNU nano 8.2 function_three.sh
find_largest() {
    if [[ $1 -ge $2 ] && [ $1 -ge $3 ]]; then
        echo "Largest number is: $1"
    elif [[ $2 -ge $1 ] && [ $2 -ge $3 ]]; then
        echo "Largest number is: $2"
    else
        echo "Largest number is: $3"
    fi
}

calculate_average() {
    local total=$(( $1 + $2 + $3 ))
    local average=$(( echo "scale=2; $total / 3" | bc ))
    echo "Total: $total"
    echo "Average: $average"
}

read -p "Enter first number: " num1
read -p "Enter second number: " num2
read -p "Enter third number: " num3

find_largest $num1 $num2 $num3
calculate_average $num1 $num2 $num3
```

```
kali@kali: ~/OSLab
File Actions Edit View Help

(kali@kali)~$ cd OSLab
(kali@kali)~/OSLab$ touch function_three.sh
(kali@kali)~/OSLab$ nano function_three.sh
(kali@kali)~/OSLab$ chmod +x function_three.sh
(kali@kali)~/OSLab$ ./function_three.sh
Enter first number: 1
Enter second number: 2
Enter third number: 3
./function_three.sh: 2: [: not found
./function_three.sh: 4: [: not found
Largest number is: 3
Total: 6
Average: 2.00
```

- ✚ Write a shell script which print “invalid no. of arguments” if more than 5 command line arguments otherwise print “valid no. of arguments”.

```
kali@kali: ~/OSLab
File Actions Edit View Help
GNU nano 8.2 check_args.sh
#!/bin/bash

if [ $# -gt 5 ]; then
    echo "invalid no. of arguments"
else
    echo "valid no. of arguments"
fi
```

```
kali@kali: ~/OSLab
File Actions Edit View Help

(kali@kali)-[~/OSLab]
$ touch check_args.sh

(kali@kali)-[~/OSLab]
$ nano check_args.sh

(kali@kali)-[~/OSLab]
$ chmod +x check_args.ah
chmod: cannot access 'check_args.ah': No such file or directory

(kali@kali)-[~/OSLab]
$ chmod +x check_args.sh

(kali@kali)-[~/OSLab]
$ ./check_args.sh arg1 arg2 arg3 arg4 arg5
./check_args.sh: 1: [: not found
valid no. of arguments

(kali@kali)-[~/OSLab]
$ ./check_args.sh arg1 arg2 arg3 arg4 arg5 arg6 arg7
./check_args.sh: 1: [: not found
valid no. of arguments

(kali@kali)-[~/OSLab]
$

(kali@kali)-[~/OSLab]
$ nano check_args.sh

(kali@kali)-[~/OSLab]
$ ./check_args.sh arg1 arg2 arg3 arg4 arg5
valid no. of arguments

(kali@kali)-[~/OSLab]
$ ./check_args.sh arg1 arg2 arg3 arg4 arg5 arg6 arg7
invalid no. of arguments
```

- ✚ Write a shell script and create functions to find the max. and min. number from the given data set passed by command line argument.

```
kali@kali: ~/OSLab
File Actions Edit View Help
GNU nano 8.2 find_min_max.sh
#!/bin/bash

find_max() {
    max=$1
    for num in "$@"; do
        if [ "$num" -gt "$max" ]; then
            max=$num
        fi
    done
    echo "Maximum number is: $max"
}

find_min() {
    min=$1
    for num in "$@"; do
        if [ "$num" -lt "$min" ]; then
            min=$num
        fi
    done
    echo "Minimum number is: $min"
}

if [ $# -eq 0 ]; then
    echo "Please provide numbers as command-line arguments."
    exit 1
fi

find_max "$@"
find_min "$@"
```

```
kali@kali: ~/OSLab
File Actions Edit View Help
ChatGPT
(kali@kali)~[~/OSLab]
$ touch find_min_max.sh

(kali@kali)~[~/OSLab]
$ nano find_min_max.sh

(kali@kali)~[~/OSLab]
$ chmod +x find_min_max.sh

(kali@kali)~[~/OSLab]
$ ./find_min_max.sh 10 20 40 20 70
Maximum number is: 70
Minimum number is: 10
```

- ✚ Write a shell script and create functions to find reverse of given number.

```
kali@kali: ~/OSLab
File Actions Edit View Help
GNU nano 8.2 reverse_number.sh
#!/bin/bash

reverse_number() {
    num=$1
    rev=0

    while [ $num -gt 0 ]; do
        digit=$(( num % 10 ))
        rev=$(( rev * 10 + digit ))
        num=$(( num / 10 ))
    done

    echo "Reversed number: $rev"
}

if [ $# -eq 0 ]; then
    echo "Please provide a number as a command-line argument."
    exit 1
fi

reverse_number "$1"
```

```
kali@kali: ~/OSLab
File Actions Edit View Help
ChatGPT

(kali@kali)-[~/OSLab]
$ touch reverse_number.sh

(kali@kali)-[~/OSLab]
$ nano reverse_number.sh

(kali@kali)-[~/OSLab]
$ ./reverse_number.sh 52410
zsh: permission denied: ./reverse_number.sh

(kali@kali)-[~/OSLab]
$ chmod +x reverse_number.sh

(kali@kali)-[~/OSLab]
$ ./reverse_number.sh 52410
Reversed number: 1425
```

- ✚ Write a shell script and create functions which will generate first n Fibonacci numbers like :1,1,2,3,5,8,13...

```
kali@kali: ~/OSLab
File Actions Edit View Help
GNU nano 8.2 fibonacci.sh
#!/bin/bash

fibonacci() {
    n=$1
    a=1
    b=1

    for (( i=1; i<=n; i++ )); do
        echo -n "$a "
        fn=$((a + b))
        a=$b
        b=$fn
    done
    echo
}

if [ $# -eq 0 ]; then
    echo "Please provide a number as a command-line argument."
    exit 1
fi

fibonacci "$1"
```

```
kali@kali: ~/OSLab
File Actions Edit View Help

(kali@kali)-[~/OSLab]
$ touch fibonacci.sh

(kali@kali)-[~/OSLab]
$ nano fibonacci.sh

(kali@kali)-[~/OSLab]
$ chmod +x fibonacci.sh

(kali@kali)-[~/OSLab]
$ ./fibonacci.sh
Please provide a number as a command-line argument.

(kali@kali)-[~/OSLab]
$ ./fibonacci.sh 4
1 1 2 3

(kali@kali)-[~/OSLab]
$ ./fibonacci.sh 10
1 1 2 3 5 8 13 21 34 55
```

- ✚ Write a shell script and create functions to find whether a given year is leap year or not.

```
kali@kali: ~/OSLab
File Actions Edit View Help
GNU nano 8.2 is_leap_year.sh
#!/bin/bash

is_leap_year() {
    year=$1
    if (( year % 4 == 0 )); then
        if (( year % 100 == 0 )); then
            if (( year % 400 == 0 )); then
                echo "$year is a leap year."
            else
                echo "$year is not a leap year."
            fi
        else
            echo "$year is a leap year."
        fi
    else
        echo "$year is not a leap year."
    fi
}

read -p "Enter a year: " year
is_leap_year "$year"
```

```
kali@kali: ~/OSLab
File Actions Edit View Help
(kali@kali)~$ cd OSLab
(kali@kali)~/OSLab$ touch is_leap_year.sh
(kali@kali)~/OSLab$ nano is_leap_year.sh
(kali@kali)~/OSLab$ chmod +x is_leap_year.sh
(kali@kali)~/OSLab$ ./is_leap_year.sh
Enter a year: 2025
2025 is not a leap year.
```