

## 4ITRC2 Operating System Lab

### Lab Assignment 3

**Q:** Give shell scripts for following:

1. To find Largest of Three Numbers

```
#!/bin/bash
echo "Enter three numbers:"
read a b c

if [ $a -ge $b ] && [ $a -ge $c ]; then
    echo "$a is the largest"
elif [ $b -ge $a ] && [ $b -ge $c ]; then
    echo "$b is the largest"
else
    echo "$c is the largest"
fi
```

2. To find a year is leap year or not.

```
#!/bin/bash
echo "Enter year:"
read year

if (( year % 400 == 0 )) || (( year % 4 == 0 && year % 100 != 0 )); then
    echo "$year is a leap year"
else
    echo "$year is not a leap year"
fi
```

3. To input angles of a triangle and find out whether it is valid triangle or not

```
#!/bin/bash
echo "Enter three angles:"
read a b c

sum=$((a + b + c))
if [ $sum -eq 180 ] && [ $a -gt 0 ] && [ $b -gt 0 ] && [ $c -gt 0 ]; then
    echo "Valid triangle"
else
    echo "Invalid triangle"
fi
```

4. To check whether a character is alphabet, digit or special character.

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

if [[ $char =~ [a-zA-Z] ]]; then
    echo "Alphabet"
elif [[ $char =~ [0-9] ]]; then
    echo "Digit"
else
    echo "Special Character"
fi
```

5. To calculate profit or loss

```
#!/bin/bash
echo "Enter cost price:"
read cp
echo "Enter selling price:"
read sp

if [ $sp -gt $cp ]; then
    profit=$((sp - cp))
    echo "Profit of Rs. $profit"
elif [ $cp -gt $sp ]; then
    loss=$((cp - sp))
    echo "Loss of Rs. $loss"
else
    echo "No profit no loss"
fi
```

6. To print all even and odd number from 1 to 10

```
#!/bin/bash
echo "Even numbers:"
for ((i=1;i<=10;i++)); do
    if (( i % 2 == 0 )); then echo $i; fi
done

echo "Odd numbers:"
for ((i=1;i<=10;i++)); do
    if (( i % 2 != 0 )); then echo $i; fi
done
```

7. To print table of a given number

```
#!/bin/bash
echo "Enter a number:"
read n

for ((i=1;i<=10;i++)); do
    echo "$n * $i = $((n*i))"
done
```

8. To find factorial of a given integer

```
#!/bin/bash
echo "Enter a number:"
read n
fact=1

for ((i=1;i<=n;i++)); do
    fact=$((fact * i))
done

echo "Factorial of $n is $fact"
```

9. To print sum of all even numbers from 1 to 10.

```
#!/bin/bash
sum=0
for ((i=2;i<=10;i+=2)); do
    sum=$((sum + i))
done

echo "Sum of even numbers from 1 to 10 is $sum"
```

10. To print sum of digit of any number.

```
#!/bin/bash
echo "Enter a number:"
read num
sum=0

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

echo "Sum of digits is $sum"
```

11. To make a basic calculator which performs addition, subtraction, Multiplication, division

```
#!/bin/bash
echo "Enter two numbers:"
read a b
echo "Choose operation (+ - * /):"
read op

case $op in
    +) echo "$a + $b = $((a + b))" ;;
    -) echo "$a - $b = $((a - b))" ;;
    \*) echo "$a * $b = $((a * b))" ;;
    /) echo "$a / $b = $((a / b))" ;;
    *) echo "Invalid operation" ;;
esac
```

```

/)
    if [ $b -ne 0 ]; then
        echo "$a / $b = $((a / b))"
    else
        echo "Cannot divide by zero"
    fi ;;
*) echo "Invalid operation" ;;
esac

```

12. To print days of a week.

```

#!/bin/bash
echo "Days of the week:"
days=("Sunday" "Monday" "Tuesday" "Wednesday" "Thursday"
"Friday" "Saturday")
for day in "${days[@]}"; do
    echo "$day"
done

```

13. To print starting 4 months having 31 days.

```

#!/bin/bash
echo "Months with 31 days:"
echo -e "January\nMarch\nMay\nJuly"

```

14. Using functions,

a. To find given number is Armstrong number or not

```

#!/bin/bash
is_armstrong() {
    num=$1
    sum=0
    temp=$num
    while [ $temp -gt 0 ]; do
        digit=$((temp % 10))
        sum=$((sum + digit**3))
        temp=$((temp / 10))
    done

    if [ $sum -eq $num ]; then
        echo "$num is an Armstrong number"
    else
        echo "$num is not an Armstrong number"
    fi
}

echo "Enter number:"
read n
is_armstrong $n

```

b. To find whether a number is palindrome or not

```
#!/bin/bash
is_palindrome() {
    num=$1
    reverse=0
    temp=$num
    while [ $temp -gt 0 ]; do
        digit=$((temp % 10))
        reverse=$((reverse * 10 + digit))
        temp=$((temp / 10))
    done

    if [ $reverse -eq $num ]; then
        echo "$num is a palindrome"
    else
        echo "$num is not a palindrome"
    fi
}

echo "Enter a number:"
read n
is_palindrome $n
```

- c. To print Fibonacci series upto n terms

```
#!/bin/bash
echo "Enter number of terms:"
read n
a=0
b=1

echo "Fibonacci Series:"
for ((i=0;i<n;i++)); do
    echo -n "$a "
    fn=$((a + b))
    a=$b
    b=$fn
done
echo
```

- d. To find given number is prime or composite

```
#!/bin/bash
echo "Enter a number:"
read n

if [ $n -lt 2 ]; then
    echo "$n is neither prime nor composite"
    exit
fi

for ((i=2;i*i<=n;i++)); do
```

```
        if ((n % i == 0)); then
            echo "$n is composite"
            exit
        fi
    done
    echo "$n is prime"
```

e. To convert a given decimal number to binary equivalent

```
#!/bin/bash
echo "Enter a decimal number:"
read dec
bin=""
while [ $dec -gt 0 ]; do
    rem=$((dec % 2))
    bin="$rem$bin"
    dec=$((dec / 2))
done
echo "Binary: $bin"
```

YASHASVI SHARMA 23I4079