**Lab Assignment 3**

**Aim:** To create shell scripts for the following questions.

**To Perform:** To code and solve the following problems.

**To Submit:** Provide shell scripts for the following:

**1. Find the Largest of Three Numbers.**

echo "Enter three numbers: "

read a b c

if [ $a -ge $b ] && [ $a -ge $c ]; then

echo "Largest number is $a"

elif [ $b -ge $a ] && [ $b -ge $c ]; then

echo "Largest number is $b"

else

echo "Largest number is $c"

fi

**2. Check if a Year is a Leap Year.**

#!/bin/bash

echo "Enter a year:"

read year

if (( (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0) )); then

echo "$year is a leap year."

else

echo "$year is not a leap year."

Fi

**3. Check if Triangle is Valid.**

#!/bin/bash

echo "Enter three angles of a triangle:"

read a b c

sum=$((a + b + c))

if [ $sum -eq 180 ]; then

echo "It is a valid triangle."

else

echo "It is not a valid triangle."

fi

**4. Check Character Type.**

#!/bin/bash

echo "Enter a character:"

read char

if [[ "$char" =~ [a-zA-Z] ]]; then

echo "It is an alphabet."

elif [[ "$char" =~ [0-9] ]]; then

echo "It is a digit."

else

echo "It is a special character."

Fi

**5. Calculate Profit or Loss.**

#!/bin/bash

echo "Enter Cost Price:"

read cp

echo "Enter Selling Price:"

read sp

if [ $sp -gt $cp ]; then

echo "Profit: $(($sp - $cp))"

elif [ $cp -gt $sp ]; then

echo "Loss: $(($cp - $sp))"

else

echo "No Profit, No Loss."

fi

**6. Print Even and Odd Numbers from 1 to 10.**

#!/bin/bash

echo "Even numbers:"

for i in {2..10..2}; do echo $i; done

echo "Odd numbers:"

for i in {1..9..2}; do echo $i; done

**7. Print Multiplication Table**

#!/bin/bash

echo "Enter a number:"

read n

for i in {1..10}; do

echo "$n x $i = $((n \* i))"

done

**8. Factorial of a Number.**

#!/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. Sum of Even Numbers from 1 to 10.**

#!/bin/bash

sum=0

for i in {2..10..2}; do

sum=$((sum + i))

done

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

**10. Sum of Digits of a Number.**

#!/bin/bash

echo "Enter a number:"

read num

sum=0

while [ $num -gt 0 ]; do

sum=$((sum + num % 10))

num=$((num / 10))

done

echo "Sum of digits is $sum"

**11. Basic Calculator.**

#!/bin/bash

echo "Enter two numbers:"

read a b

echo "Choose operation: + - \* /"

read op

case $op in

"+") echo "Result: $((a + b))" ;;

"-") echo "Result: $((a - b))" ;;

"\*") echo "Result: $((a \* b))" ;;

"/") echo "Result: $((a / b))" ;;

\*) echo "Invalid operation" ;;

Esac

**12. Print Days of the Week**

#!/bin/bash

days=("Sunday" "Monday" "Tuesday" "Wednesday" "Thursday" "Friday"

"Saturday")

for day in "${days[@]}"; do echo $day; done

**13. Print First 4 Months with 31 Days**

#!/bin/bash

months=("January" "March" "May" "July")

for month in "${months[@]}"; do echo $month; done

**14. Using Functions**

**(a) Check Armstrong Number**

#!/bin/bash

is\_armstrong() {

num=$1 sum=0 n=${#num}

for (( i=0; i<n; i++ )); do

digit=${num:i:1}

sum=$((sum + digit\*\*n))

done

[[ $sum -eq $num ]] && echo "$num is an Armstrong number" || echo

"$num is not an Armstrong number"

}

echo "Enter a number:"

read num

is\_armstrong $num

**(b) Check Palindrome**

#!/bin/bash

is\_palindrome() {

num=$1 rev=$(echo $num | rev)

[[ $num -eq $rev ]] && echo "$num is a palindrome" || echo "$num is

not a palindrome"

}

echo "Enter a number:"

read num

is\_palindrome $num

**(c) Fibonacci Series**

#!/bin/bash

fibonacci() {

a=0 b=1

echo -n "$a $b"

for (( i=2; i<$1; i++ )); do

c=$((a + b))

echo -n " $c"

a=$b

b=$c

done

echo

}

echo "Enter number of terms:"

read n

fibonacci $n

**(d) Check Prime or Composite**

#!/bin/bash

is\_prime() {

num=$1

if [ $num -lt 2 ]; then

echo "$num is neither prime nor composite"

return

fi

for (( i=2; i\*i<=num; i++ )); do

if [ $((num % i)) -eq 0 ]; then

echo "$num is composite"

return

fi

done

echo "$num is prime"

}

echo "Enter a number:"

read num

is\_prime $num

**(e) Convert Decimal to Binary**

#!/bin/bash

decimal\_to\_binary() {

num=$1 binary=""

while [ $num -gt 0 ]; do

binary=$((num % 2))$binary

num=$((num / 2))

done

echo "Binary: $binary"

}

echo "Enter a decimal number:"

read num

decimal\_to\_binary $num