**Assignment – 3**  
**Aim**: To create shell scripts for the following questions   
  
**To perform**: To code and solve the following  
  
 **To submit:** Give shell scripts for following:

**1. To find the largest of three numbers**

#!/bin/bash

echo "Enter three numbers:"

read num1 num2 num3

**if** [ $num1 -gt $num2 ] && [ $num1 -gt $num3 ]; **then**

echo "$num1 is the largest number."

**elif** [ $num2 -gt $num1 ] && [ $num2 -gt $num3 ]; **then**

echo "$num2 is the largest number."

**else**

echo "$num3 is the largest number."

**fi**

**2. To check if a year is a leap year**

#!/bin/bash

echo "Enter a year:"

read year

**if** [ $(($year % 4)) -eq 0 ] && ([ $(($year % 100)) -ne 0 ] || [ $(($year % 400)) -eq 0 ]); **then**

echo "$year is a leap year."

**else**

echo "$year is not a leap year."

**fi**

**3. To check if angles form a valid triangle**

#!/bin/bash

echo "Enter three angles of a triangle:"

read angle1 angle2 angle3

sum=$((angle1 + angle2 + angle3))

**if** [ $sum -eq 180 ] && [ $angle1 -gt 0 ] && [ $angle2 -gt 0 ] && [ $angle3 -gt 0 ]; **then**

echo "The angles form a valid triangle."

**else**

echo "The angles do not form a valid triangle."

**fi**

**4. To check if a character is an alphabet, digit, or special character**

bash

#!/bin/bash

echo "Enter a character:"

read char

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

echo "$char is an alphabet."

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

echo "$char is a digit."

**else**

echo "$char is a special character."

**fi**

**5. To calculate profit or loss**

bash

#!/bin/bash

echo "Enter cost price and selling price:"

read cp sp

**if** [ $sp -gt $cp ]; **then**

profit=$((sp - cp))

echo "Profit: $profit"

**elif** [ $cp -gt $sp ]; **then**

loss=$((cp - sp))

echo "Loss: $loss"

**else**

echo "No profit, no loss."

**fi**

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

bash

#!/bin/bash

echo "Even numbers:"

**for** i **in** {1..10}; **do**

**if** [ $(($i % 2)) -eq 0 ]; **then**

echo $i

**fi**

**done**

echo "Odd numbers:"

**for** i **in** {1..10}; **do**

**if** [ $(($i % 2)) -ne 0 ]; **then**

echo $i

**fi**

**done**

**7. To print the multiplication table of a given number**

bash

#!/bin/bash

echo "Enter a number:"

read num

**for** i **in** {1..10}; **do**

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

**done**

**8. To find factorial of an integer**

#!/bin/bash

echo "Enter an integer:"

read num

factorial=1

**for** ((i=1; i<=num; i++)); **do**

factorial=$((factorial \* i))

**done**

echo "Factorial of $num is $factorial."

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

#!/bin/bash

sum=0

**for** i **in** {1..10}; **do**

**if** [ $(($i % 2)) -eq 0 ]; **then**

sum=$(($sum + $i))

**fi**

**done**

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

**10. To print the sum of digits 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: $sum"

**11. Basic calculator (addition, subtraction, multiplication, division)**

#!/bin/bash

echo "Enter two numbers:"

read num1 num2

echo "Choose operation (+, -, \*, /):"

read op

**case** "$op" **in**

"+") result=$(($num1 + $num2)) ;;

"-") result=$(($num1 - $num2)) ;;

"\*") result=$(($num1 \* $num2)) ;;

"/") result=$(($num1 / $num2)) ;;

\*) echo "Invalid operation"; exit ;;

**esac**

echo "Result: $result"

**12. To print days of the week**

#!/bin/bash

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

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

echo "$day"

**done**

**13. To print starting four months having 31 days**

#!/bin/bash

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

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

echo "$month"

**done**

**Functions for Advanced Tasks:**

**(a) To check if a number is Armstrong:**

is\_armstrong() {

num=$1

sum=0

temp=$num

**while** [ $temp -gt 0 ]; **do**

digit=$(($temp % 10))

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

temp=$(($temp / 10))

**done**

**if** [ $sum -eq $num ]; **then**

echo "$num is an Armstrong number."

**else**

echo "$num is not an Armstrong number."

**fi**

}

is\_armstrong <number>

**(b) To check if a number is palindrome:**

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**

}

is\_palindrome <number>

**(c) To print Fibonacci series up to n terms:**

fibonacci() {

n=$1

a=0

b=1

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

echo "$a"

next=$((a + b))

a=$b

b=$next

**done**

}

fibonacci <terms>

**(d) To check if a number is prime:**

is\_prime() {

num=$1

**if** [ $num -le 1 ]; **then**

echo "$num is not prime."; return;

**fi**

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

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

echo "$num is composite."; return;

**fi**

**done**

echo "$number Prime."

}

is\_prime <number>