Operating System

(4ITRC2)

IT IV Semester

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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
```
