

# **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
}
```

```
        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
```