Lab Assignment -3

1. Find the largest of three numbers

```
echo "Enter three numbers:"
read a b c
if [ $a -gt $b ] && [ $a -gt $c ]; then
   echo "Largest number is $a"
elif [ $b -gt $a ] && [ $b -gt $c ]; then
   echo "Largest number is $b"
else
   echo "Largest number is $c"
fi
```

2. Check if a year is a leap year

```
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 angles form a valid triangle

```
echo "Enter three angles:"
read x y z
sum=$((x + y + z))
if [ $sum -eq 180 ]; then
   echo "Valid Triangle"
else
```

```
    echo "Invalid Triangle"
fi
```

4. Check if a character is alphabet, digit, or special character

```
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. Calculate profit or loss

```
echo "Enter Cost Price and Selling Price:"
read cp sp
diff=$((sp - cp))
if [ $diff -gt 0 ]; then
    echo "Profit: $diff"
elif [ $diff -lt 0 ]; then
    echo "Loss: ${diff#-}"
else
    echo "No Profit No Loss"
fi
```

6. Print all even and odd numbers from 1 to 10

```
echo "Even numbers:"
for ((i=2; i<=10; i+=2)); do echo $i; done
echo "Odd numbers:"
```

```
for ((i=1; i<=10; i+=2)); do echo $i; done
```

7. Print table of a given number

```
echo "Enter a number:"
read num
for ((i=1; i<=10; i++)); do
    echo "$num x $i = $((num * i))"
done
```

8. Find factorial of a number

```
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. Print sum of all even numbers from 1 to 10

```
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. Print sum of digits of a number

```
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. Basic calculator

```
echo "Enter two numbers:"
read a b
echo "Enter 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 a week

```
echo "Days of the week:"
echo -e "Sunday\nMonday\nTuesday\nWednesday\nThursday\nFriday\nSaturday"
```

13. Print first 4 months with 31 days

```
echo "January\nMarch\nMay\nJuly"
```

14a. Check if a number is an Armstrong number

```
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
}
```

14b. Check if a number is a palindrome

```
is_palindrome() {
    num=$1
    rev=$(echo $num | rev)
    if [ "$num" -eq "$rev" ]; then
        echo "$num is a palindrome."
    else
        echo "$num is not a palindrome."
    fi
}
```

14c. Print Fibonacci series up to n terms

```
fibonacci() {
    n=$1
```

```
    a=0
    b=1
    echo -n "$a $b "
    for ((i=2; i<n; i++)); do
        c=$((a + b))
        echo -n "$c "
        a=$b
        b=$c
    done
    echo
}
```

14d. Check if a number is prime or composite

```
is_prime() {
    num=$1
    if [ $num -lt 2 ]; then echo "Not prime"; 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"
}
```

14e. Convert decimal to binary

```
dec_to_bin() {
    num=$1
    echo "Binary equivalent: $(echo "obase=2; $num" | bc)"}
```