Operating System Lab

(4ITRC2)

IT IV Semester

Submitted by

Himanshu Priyadarshi Ahirwar

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Jasneet Kaur

Department of Information Technology

Institute of Engineering and Technology

Devi Ahilya Vishwavidhyalaya, Indore (M.P.) India

(www.iet.dauniv.ac.in**)**

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Shell Scripts

Q1. To find Largest of Three Numbers

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Largest of Three Numbers".sh
```

```
 GNU nano 7.2                                  Largest of Three Numbers.sh *
#!/bin/bash
echo "Enter three numbers:"
read a b c

if [ $a -ge $b ] && [ $a -ge $c ]; then
    echo "$a is the largest"
elif [ $b -ge $a ] && [ $b -ge $c ]; then
    echo "$b is the largest"
else
    echo "$c is the largest"
fi
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Largest of Three Numbers".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Largest of Three Numbers".sh
Enter three numbers:
8 9 5
9 is the largest
```

Q2. To find a year is leap year or not.

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Check Leap Year".sh
```

```
 GNU nano 7.2                                  Check Leap Year.sh
#!/bin/bash
echo "Enter 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
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Check Leap Year".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Check Leap Year".sh
Enter year:
1904
1904 is a leap year
```

Q3. To input angles of a triangle and find out whether it is valid triangle or not

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Check Valid Triangle".sh
```

```
  GNU nano 7.2                          Check Valid Triangle.sh *
#!/bin/bash
echo "Enter three angles of triangle:"
read a b c
sum=$((a + b + c))

if [ $sum -eq 180 ] && [ $a -gt 0 ] && [ $b -gt 0 ] && [ $c -gt 0 ]; then
    echo "Valid triangle"
else
    echo "Invalid triangle"
fi
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Check Valid Triangle".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Check Valid Triangle".sh
Enter three angles of triangle:
60 75 60
Invalid triangle
```

Q4. To check whether a character is alphabet, digit or special character.

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Character Type Check".sh
```

```
  GNU nano 7.2                          Character Type Check.sh *
#!/bin/bash
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
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Character Type Check".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Character Type Check".sh
Enter a character:
@
Special character
```

Q5. To calculate profit or loss

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Calculate Profit or Loss".sh
```

```
  GNU nano 7.2                          Calculate Profit or Loss.sh *
#!/bin/bash
echo "Enter cost price:"
read cp
echo "Enter selling price:"
read 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
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Calculate Profit or Loss".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Calculate Profit or Loss".sh
Enter cost price:
1000
Enter selling price:
1500
Profit: 500
```

Q6. To print all even and odd number from 1 to 10

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Print Even and Odd Numbers 1 to 10".sh
```

```
  GNU nano 7.2                  Print Even and Odd Numbers 1 to 10.sh *
#!/bin/bash
echo "Even numbers:"
for i in {1..10}
do
    if (( i % 2 == 0 )); then
        echo -n "$i "
    fi
done

echo -e "\nOdd numbers:"
for i in {1..10}
do
    if (( i % 2 != 0 )); then
        echo -n "$i "
    fi
done
echo
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Print Even and Odd Numbers 1 to 10".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Print Even and Odd Numbers 1 to 10".sh
Even numbers:
2 4 6 8 10
Odd numbers:
1 3 5 7 9
```

Q7. To print table of a given number

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Print Table of a Given Number".sh
```

```
  GNU nano 7.2                    Print Table of a Given Number.sh *
#!/bin/bash
echo "Enter a number:"
read n

for i in {1..10}
do
    echo "$n * $i = $((n * i))"
done
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Print Table of a Given Number".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Print Table of a Given Number".sh
Enter a number:
4
4 * 1 = 4
4 * 2 = 8
4 * 3 = 12
4 * 4 = 16
4 * 5 = 20
4 * 6 = 24
4 * 7 = 28
4 * 8 = 32
4 * 9 = 36
4 * 10 = 40
```

Q8. To find factorial of a given integer

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Find Factorial".sh
```

```
  GNU nano 7.2                          Find Factorial.sh *
#!/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"
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Find Factorial".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Find Factorial".sh
Enter a number:
7
Factorial of 7 is 5040
```

Q9. To print sum of all even numbers from 1 to 10.

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Sum of Even Numbers from 1 to 10".sh
```

```
  GNU nano 7.2                  Sum of Even Numbers from 1 to 10.sh *
#!/bin/bash
sum=0
for i in {1..10}
do
    if (( i % 2 == 0 )); then
        sum=$((sum + i))
    fi
done
echo "Sum of even numbers from 1 to 10 is: $sum"
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Sum of Even Numbers from 1 to 10".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Sum of Even Numbers from 1 to 10".sh
Sum of even numbers from 1 to 10 is: 30
```

Q10. To print sum of digit of any number.

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Sum of Digits of a Number".sh
```

```
  GNU nano 7.2                    Sum of Digits of a Number.sh *
#!/bin/bash
echo "Enter a number:"
read num
sum=0

while [ $num -ne 0 ]
do
    digit=$((num % 10))
    sum=$((sum + digit))
    num=$((num / 10))
done

echo "Sum of digits is $sum"
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Sum of Digits of a Number".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Sum of Digits of a Number".sh
Enter a number:
567
Sum of digits is 18
```

Q11. To make a basic calculator which performs addition, subtraction, Multiplication, division

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Basic Calculator".sh
```

```
  GNU nano 7.2                                Basic Calculator.sh *
#!/bin/bash

echo "Enter first number:"
read a
echo "Enter second number:"
read b

echo "Choose operation: + - * /"
read op

case $op in
    +) echo "Result: $((a + b))" ;;
    -) echo "Result: $((a - b))" ;;
    \*) echo "Result: $((a * b))" ;;      # use \* to escape *
    /)
        if [ $b -ne 0 ]; then
            echo "Result: $((a / b))"
        else
            echo "Cannot divide by zero"
        fi
        ;;
    *) echo "Invalid operation" ;;
esac
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Basic Calculator".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Basic Calculator".sh
Enter first number:
9
Enter second number:
5
Choose operation: + - * /
*
Result: 45
```

Q12. To print days of a week.

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Print Days of the Week".sh
```

```
  GNU nano 7.2                        Print Days of the Week.sh *
#!/bin/bash

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

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

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Print Days of the Week".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Print Days of the Week".sh
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
```

Q13. To print starting 4 months having 31 days.

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "First 4 months having 31 days".sh
```

```
  GNU nano 7.2                        First 4 months having 31 days.sh
#!/bin/bash

echo "Months with 31 days:"
months=("January" "March" "May" "July")
for month in "${months[@]}"
do
    echo "$month"
done
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "First 4 months having 31 days".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"First 4 months having 31 days".sh
Months with 31 days:
January
March
May
July
```

Q14. Using functions,

a. To find given number is Amstrong number or not

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Armstrong Numbers".sh
```

```
  GNU nano 7.2                                  Armstrong Numbers.sh
#!/bin/bash

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
}

echo "Enter a number:"
read n
is_armstrong $n
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Armstrong Numbers".sh
Enter a number:
153
153 is an Armstrong number
```

b. To find whether a number is palindrome or not

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Palindrome Number".sh
```

```
  GNU nano 7.2                                  Palindrome Number.sh *
#!/bin/bash

is_palindrome() {
    num=$1
    rev=0
    temp=$num

    while [ $temp -gt 0 ]
    do
        digit=$((temp % 10))
        rev=$((rev * 10 + digit))
        temp=$((temp / 10))
    done

    if [ $rev -eq $num ]; then
        echo "$num is a palindrome"
    else
        echo "$num is not a palindrome"
    fi
}

echo "Enter a number:"
read n
is_palindrome $n
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Palindrome Number".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Palindrome Number".sh
Enter a number:
1331
1331 is a palindrome
```

c. To print Fibonacci series upto n terms

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Fibnoacci Series".sh
```

```
  GNU nano 7.2                                  Fibnoacci Series.sh
#!/bin/bash

fibonacci() {
    n=$1
    a=0
    b=1

    echo "Fibonacci series up to $n terms:"
    for ((i=0; i<n; i++))
    do
        echo -n "$a "
        fn=$((a + b))
        a=$b
        b=$fn
    done
    echo
}

echo "Enter number of terms:"
read n
fibonacci $n
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Fibnoacci Series".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Fibnoacci Series".sh
Enter number of terms:
5
Fibonacci series up to 5 terms:
0 1 1 2 3
```

d. To find given number is prime or composite

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Prime or Composite".sh
```

```
  GNU nano 7.2                                  Prime or Composite.sh
#!/bin/bash

is_prime() {
    num=$1
    if [ $num -lt 2 ]; then
        echo "$num is neither prime nor composite"
        return
    fi

    for ((i=2; i<=num/2; i++))
    do
        if ((num % i == 0)); then
            echo "$num is composite"
            return
        fi
    done
    echo "$num is prime"
}

echo "Enter a number:"
read n
is_prime $n
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Prime or Composite".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Prime or Composite".sh
Enter a number:
93
93 is composite
```

e. To convert a given decimal number to binary equivalent

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ nano "Decimal to Binary Conversion".sh
```

```
  GNU nano 7.2                    Decimal to Binary Conversion.sh
#!/bin/bash

dec_to_bin() {
    num=$1
    bin=""
    while [ $num -gt 0 ]
    do
        rem=$((num % 2))
        bin="${rem}${bin}"
        num=$((num / 2))
    done

    if [ -z "$bin" ]; then
        bin=0
    fi

    echo "Binary: $bin"
}

echo "Enter a decimal number:"
read n
dec_to_bin $n
```

```
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ chmod +x "Decimal to Binary Conversion".sh
himanshu@VivoBook-ASUSLaptop-X509DAP-M509DA:~$ ./"Decimal to Binary Conversion".sh
Enter a decimal number:
7
Binary: 111
```