**4ITRC2 Operating System Lab**

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**Lab 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 Largest of Three Numbers

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

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

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

5. To calculate profit or loss

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

7. To print table of a given number

8. To find factorial of a given integer

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

10. To print sum of digit of any number.

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

division

12. To print days of a week.

13. To print starting 4 months having 31 days.

14. Using functions,

a. To find given number is Amstrong number or not

b. To find whether a number is palindrome or not

c. To print Fibonacci series upto n terms

d. To find given number is prime or composite

e. To convert a given decimal number to binary equivalent

# 1. Find the largest of three numbers

Ashutosh Chandoriya

23I4121

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:"

Ashutosh Chandoriya

23I4121

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

Ashutosh Chandoriya

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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

Ashutosh Chandoriya

23I4121

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."

Ashutosh Chandoriya

23I4121

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

}

Ashutosh Chandoriya

23I4121

# 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)"

}