

3a)

i)

Aim: To write a shell script to build a basic calculator

Program:

```
Select haresh@haresh: /mnt/c/WINDOWS/OS_lab
#!/bin/bash

echo "***** BASIC CALCULATOR *****"
echo "Choose an operation:"
echo "1. Addition (+)"
echo "2. Subtraction (-)"
echo "3. Multiplication (*)"
echo "4. Division (/)"

read -p "Enter your choice [1-4]: " choice

read -p "Enter first number: " num1
read -p "Enter second number: " num2

case $choice in
  1)
    result=$((echo "$num1 + $num2" | bc))
    echo "Result: $num1 + $num2 = $result"
    ;;
  2)
    result=$((echo "$num1 - $num2" | bc))
    echo "Result: $num1 - $num2 = $result"
    ;;
  3)
    result=$((echo "$num1 * $num2" | bc))
    echo "Result: $num1 * $num2 = $result"
    ;;
  4)
    if [ "$num2" == "0" ]; then
      echo "Error: Division by zero!"
    else
      result=$((echo "scale=2; $num1 / $num2" | bc))
      echo "Result: $num1 / $num2 = $result"
    fi
    ;;
  *)
    echo "Invalid choice!"
    ;;
esac

"calc.sh" 40L, 837B 40,0-1 All
```

Output:

```
***** BASIC CALCULATOR *****
Choose an operation:
1. Addition (+)
2. Subtraction (-)
3. Multiplication (*)
4. Division (/)
Enter your choice [1-4]: 1
Enter first number: 1
Enter second number: 2
Result: 1 + 2 = 3
```

ii)

Aim: To write a shell script to test a given year is leap or not using conditional statement.

Program:

```
#!/bin/bash

read -p "Enter a year: " year

if (( year % 400 == 0 )); then
    echo "$year is a leap year."
elif (( year % 100 == 0 )); then
    echo "$year is not a leap year."
elif (( year % 4 == 0 )); then
    echo "$year is a leap year."
else
    echo "$year is not a leap year."
fi
```

Output:

```
Enter a year: 2024
leapyear.sh: 5: year: not found
leapyear.sh: 7: year: not found
leapyear.sh: 9: year: not found
2024 is not a leap year.
```

3b)

i) To write a shell script to reverse a digit

Program:

```
#!/bin/bash

read -p "Enter a number: " num

reverse=0

while [ $num -gt 0 ]
do
    rem=$(( num % 10 ))
    reverse=$(( reverse * 10 + rem ))
    num=$(( num / 10 ))
done

echo "Reversed number: $reverse"
```

Output:

```
reverseDigit.sh: 1: #!/bin/bash: not found
Enter a number: 123
Reversed number: 321
```

ii) To generate a Fibonacci series using a for loop

Program:

```
#!/bin/bash
read -p "Enter the number of terms: " n
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
```

Output:

```
Fibonacci Series up to 7 terms:
0 1 1 2 3 5 8
```