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Instructions

write a Shell Programming (I/O, Decision making, Looping, Multi-level branching)

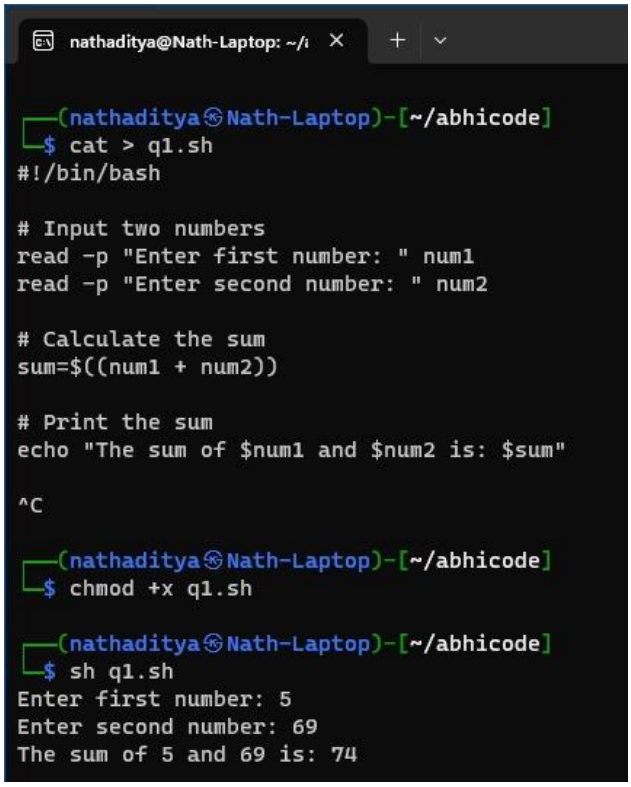
1. *Addition of TWO numbers*

```
#!/bin/bash

# Input two numbers
read -p "Enter first number: " num1
read -p "Enter second number: " num2

# Calculate the sum
sum=$((num1 + num2))

# Print the sum
echo "The sum of $num1 and $num2 is: $sum"
```



2. *Find the smallest of TWO numbers*

```
#!/bin/bash

# Input two numbers
read -p "Enter first number: " num1
read -p "Enter second number: " num2

# Check which is the smaller number
if [ $num1 -lt $num2 ]; then
  echo "$num1 is smaller than $num2"
else
  echo "$num2 is smaller than $num1"
```

fi

```
┌──(nathaditya㉿Nath-Laptop)-[~/abhicode]
└─$ cat > q2.sh
#!/bin/bash

# Input two numbers
read -p "Enter first number: " num1
read -p "Enter second number: " num2

# Check which is the smaller number
if [ $num1 -lt $num2 ]; then
  echo "$num1 is smaller than $num2"
else
  echo "$num2 is smaller than $num1"
fi

^C

┌──(nathaditya㉿Nath-Laptop)-[~/abhicode]
└─$ chmod +x q2.sh

┌──(nathaditya㉿Nath-Laptop)-[~/abhicode]
└─$ sh q2.sh
Enter first number: 9
Enter second number: 2
2 is smaller than 9
```

3. User is valid or not

```
#!/bin/bash

# Input the username
read -p "Enter username: " username

# Check if the user exists in the system
if id "$username" >/dev/null 2>&1; then
  echo "$username is a valid user"
else
  echo "$username is not a valid user"
fi
```

4. Write a Shell program to check the given year is leap year or not

```
#!/bin/bash

# Input the year
read -p "Enter year: " year

# Check if the year is a leap year
if [ $(($year % 400)) -eq 0 ] || ([ $(($year % 4)) -eq 0 ] && [ $(($year % 100)) -ne 0 ]); then
  echo "$year is a leap year"
else
  echo "$year is not a leap year"
fi
```

```
┌──(nathaditya㉿Nath-Laptop)-[~/abhicode]
└─$ cat > q4.sh
#!/bin/bash

# Input the year
read -p "Enter year: " year

# Check if the year is a leap year
if [ $(($year % 400)) -eq 0 ] || ([ $(($year % 4)) -eq 0 ] && [ $(($year % 100)) -ne 0 ]); then
  echo "$year is a leap year"
else
  echo "$year is not a leap year"
fi

^C

┌──(nathaditya㉿Nath-Laptop)-[~/abhicode]
└─$ sh q4.sh
Enter year: 2004
2004 is a leap year
```

5. Write a Shell program to find the factorial of a number

```
#!/bin/bash

# Input the number
read -p "Enter number: " num

# Initialize the factorial to 1
factorial=1

# Calculate the factorial
for i in $(seq 1 1 $num); do
  factorial=$((factorial * i))
done

# Print the factorial
echo "The factorial of $num is: $factorial"
```

```
┌──(nathaditya㉿Nath-Laptop)-[~/abhicode]
└─$ cat q5.sh
#!/bin/bash

# Input the number
read -p "Enter number: " num

# Initialize the factorial to 1
factorial=1

# Calculate the factorial
for i in $(seq 1 1 $num); do
  factorial=$((factorial * i))
done

# Print the factorial
echo "The factorial of $num is: $factorial"

┌──(nathaditya㉿Nath-Laptop)-[~/abhicode]
└─$ sh q5.sh
Enter number: 5
The factorial of 5 is: 120
```

6. Write a code to produce
   0
   1 0
   2 1 0
   3 2 1 0
   4 3 2 1 0
   5 4 3 2 1 0
   6 5 4 3 2 1 0
   7 6 5 4 3 2 1 0
   8 7 6 5 4 3 2 1 0
   9 8 7 6 5 4 3 2 1 0

```
#!/bin/bash

# Loop through the numbers from 0 to 9
for i in $(seq 0 1 9); do
  # Loop through the numbers from $i to 0
  for j in $(seq $i -1 0); do
    # Print the current number
    echo -n "$j "
  done
  # Move to a new line
  echo
```

done

```
┌──(nathaditya㉿Nath-Laptop)-[~/abhicode]
└─$ cat q6.sh
#!/bin/bash

# Loop through the numbers from 0 to 9
for i in $(seq 0 1 9); do
  # Loop through the numbers from $i to 0
  for j in $(seq $i -1 0); do
    # Print the current number
    echo -n "$j "
  done
  # Move to a new line
  echo
done

┌──(nathaditya㉿Nath-Laptop)-[~/abhicode]
└─$ sh q6.sh
0
1 0
2 1 0
3 2 1 0
4 3 2 1 0
5 4 3 2 1 0
6 5 4 3 2 1 0
7 6 5 4 3 2 1 0
8 7 6 5 4 3 2 1 0
9 8 7 6 5 4 3 2 1 0
```