Assignment 2

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ECE

Question 1: To write a program to identify whether the given number is positive or negative using shell programming.

Answer 1:

```
1  #! /bin/bash
2  echo "Enter a number:"
3  read num
4  if [ $num -gt 0 ]; then
5      echo "The number is positive."
6  elif [ $num -lt 0 ]; then
7      echo "The number is negative."
8  else
9      echo "The number is zero."
10 fi
```

```
(base) navneetyadav@Navneets-MacBook-Air OS_labs %  /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q1.sh"
Enter a number:
4
The number is positive.
(base) navneetyadav@Navneets-MacBook-Air OS_labs %  /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q1.sh"
Enter a number:
-3
The number is negative.
```

Question 2: To find the largest and smallest of three numbers using shell programming**.**

Answer 2:

```
#!/bin/bash
echo "Enter three numbers:"
read a b c
largest=$a
smallest=$a
if [$b -gt $largest ]; then
    largest=$b
fi
if [ $c -gt $largest ]; then
    largest=$c
fi
if [ $b -lt $smallest ]; then
    smallest=$b
fi
if [ $c -lt $smallest l; then
    smallest=$c
fi
echo "Largest: $largest"
echo "Smallest: $smallest"
```

```
(base) navneetyadav@Navneets-MacBook-Air OS_labs % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q2.sh"
Enter three numbers:
2 3 4
/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q2.sh: line 6: [3: command not found
/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q2.sh: line 15: [: missing `]'
Largest: 4
Smallest: 2
(base) navneetyadav@Navneets-MacBook-Air OS_labs % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q2.sh"
Enter three numbers:
-2 5 9
/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q2.sh: line 6: [5: command not found
/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q2.sh: line 15: [: missing `]'
Largest: 9
Smallest: -2
```

Question 3: To find the sum and average of N numbers using shell programming.

Answer 3:

```bash
#!/bin/bash
echo "Enter the count of numbers:"
read n
sum=0
for ((i=1; i<=n; i++)); do
    echo "Enter number $i:"
    read num
    sum=$((sum + num))
done
avg=$(echo "scale=2; $sum / $n" | bc)
echo "Sum: $sum"
echo "Average: $avg"
```

```
(base) navneetyadav@Navneets-MacBook-Air OS_labs % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q3.sh"
Enter the count of numbers:
3
Enter number 1:
3
Enter number 2:
6
Enter number 3:
4
Sum: 13
Average: 4.33
```

Question 4: To find the factorial of the given number using shell programming**.**

Answer 4:

```bash
#!/bin/bash
echo "Enter a number:"
read num
fact=1
for ((i=1; i<=num; i++)); do
    fact=$((fact * i))
done
echo "Factorial: $fact"
```

```
(base) navneetyadav@Navneets-MacBook-Air OS_labs % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q4.sh"
Enter a number:
6
Factorial: 720
```

Question 5: To write a program to find the sequence of odd numbers present up to given n number.

Answer 5:

```bash
#!/bin/bash
echo "Enter a number:"
read n
echo "Odd numbers up to $n:"
for ((i=1; i<=n; i+=2)); do
    echo $i
done
```

```
(base) navneetyadav@Navneets-MacBook-Air OS_labs % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q5.sh"
Enter a number:
10
Odd numbers up to 10:
1
3
5
7
9
```

Question 6: To write a program to find the sum of series using shell programming.

S=1^2+2^2+3^2+...+n^2

Answer 6:

```bash
#!/bin/bash
echo "Enter a number:"
read n
sum=0
for ((i=1; i<=n; i++)); do
    sum=$((sum + i*i))
done
echo "Sum of series: $sum"
```

```
(base) navneetyadav@Navneets-MacBook-Air OS_labs % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q6.sh"
Enter a number:
6
Sum of series: 91
```

Question 7: To write a shell program to perform the arithmetic operation using switch case.

Answer 7:

```bash
#!/bin/bash
# Shell script to perform arithmetic operations using switch-case
read -p "Enter the first number: " num1
read -p "Enter the second number: " num2

echo "Choose an operation:"
echo "1. Addition (+)"
echo "2. Subtraction (-)"
echo "3. Multiplication (*)"
echo "4. Division (/)"
echo "5. Modulus (%)"
read -p "Enter your choice (1-5): " operation

case $operation in
    1)
        result=$((num1 + num2))
        echo "Result: $num1 + $num2 = $result"
        ;;
    2)
        result=$((num1 - num2))
        echo "Result: $num1 - $num2 = $result"
        ;;
    3)
        result=$((num1 * num2))
        echo "Result: $num1 * $num2 = $result"
        ;;
    4)
        if [ "$num2" -ne 0 ]; then
            result=$(echo "scale=2; $num1 / $num2" | bc)
            echo "Result: $num1 / $num2 = $result"
        else
            echo "Error: Division by zero is not allowed."
        fi
        ;;
    5)
        if [ "$num2" -ne 0 ]; then
            result=$((num1 % num2))
            echo "Result: $num1 % $num2 = $result"
        else
            echo "Error: Modulus by zero is not allowed."
        fi
        ;;
    *)
        echo "Invalid operation. Please choose a valid option (1-5)."
        ;;
esac

```

```
(base) navneetyadav@Navneets-MacBook-Air OS_labs % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q7.sh"
Enter the first number: 9
Enter the second number: 7
Choose an operation:
1. Addition (+)
2. Subtraction (-)
3. Multiplication (*)
4. Division (/)
5. Modulus (%)
Enter your choice (1-5): 1
Result: 9 + 7 = 16
```

Question 8: To write a shell program to find the length of the string.

Answer 8:

```
1  #!/bin/bash
2  echo "Enter a string:"
3  read str
4  echo "Length of the string: ${#str}"
```

```
(base) navneetyadav@Navneets-MacBook-Air OS_labs %  /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assign
ment_2/q8.sh"
Enter a string:
Navneet
Length of the string: 7
```

Question 9: To write a shell program to perform various pattern search using file.

Answer 9:

```bash
#!/bin/bash
echo "Enter the name of the file (with extension):"
read file

if [! -f "$file" ]; then
    echo "File not found!"
    exit 1
fi

echo "Choose the type of pattern search you want to perform:"
echo "1. Search for a specific word"
echo "2. Search for a word (case insensitive)"
echo "3. Count occurrences of a word"
echo "4. Search for a pattern with regular expression"
echo "5. Display lines containing a specific word"
echo "6. Search and display lines without a specific word"
read choice

case $choice in
    1)
        echo "Enter the word to search for:"
        read word
        grep -w "$word" "$file"
        ;;
    2)
        echo "Enter the word to search for (case insensitive):"
        read word
        grep -iw "$word" "$file"
        ;;
    3)
        echo "Enter the word to count occurrences of:"
        read word
        count=$(grep -o -w "$word" "$file" | wc -l)
        echo "The word '$word' appears $count times."
        ;;
    4)
        echo "Enter the regular expression to search for:"
        read regex
        grep -E "$regex" "$file"
        ;;
    5)
        echo "Enter the word to display lines containing it:"
        read word
        grep -w "$word" "$file"
        ;;
    6)
        echo "Enter the word to search and display lines without it:"
        read word
        grep -vw "$word" "$file"
        ;;
    *)
        echo "Invalid choice. Please select a valid option."
        ;;
esac
```

```
(base) navneetyadav@Navneets-MacBook-Air Assignment_2 % cd "/Users/navneetyadav/Desktop/OS_labs/Assignment_2"
bash q9.sh
Enter the name of the file (with extension):
test_file.txt
q9.sh: line 5: [!: command not found
Choose the type of pattern search you want to perform:
1. Search for a specific word
2. Search for a word (case insensitive)
3. Count occurrences of a word
4. Search for a pattern with regular expression
5. Display lines containing a specific word
6. Search and display lines without a specific word
2
Enter the word to search for (case insensitive):
This
This side Navneet Yadav
```

Question 10: To write a shell program to perform sum of series using switch case.

Answer 10:

```bash
#!/bin/bash
echo "Choose the type of series sum you want to calculate:"
echo "1. Sum of squares of numbers up to N (1² + 2² + 3² + ... + N²)"
echo "2. Sum of cubes of numbers up to N (1³ + 2³ + 3³ + ... + N³)"
echo "Enter your choice (1/2):"
read choice

echo "Enter the value of N:"
read N

sum=0

case $choice in
    1)
        for (( i=1; i<=N; i++ )); do
            sum=$((sum + i*i))
        done
        echo "The sum of squares of numbers up to $N is: $sum"
        ;;
    2)
        for (( i=1; i<=N; i++ )); do
            sum=$((sum + i*i*i))
        done
        echo "The sum of cubes of numbers up to $N is: $sum"
        ;;
    *)
        echo "Invalid choice! Please select a valid option."
        ;;
esac
```

```
(base) navneetyadav@Navneets-MacBook-Air Assignment_2 % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q10.sh"
Choose the type of series sum you want to calculate:
1. Sum of squares of numbers up to N (1² + 2² + 3² + ... + N²)
2. Sum of cubes of numbers up to N (1³ + 2³ + 3³ + ... + N³)
Enter your choice (1/2):
1
Enter the value of N:
6
The sum of squares of numbers up to 6 is: 91
(base) navneetyadav@Navneets-MacBook-Air Assignment_2 % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q10.sh"
Choose the type of series sum you want to calculate:
1. Sum of squares of numbers up to N (1² + 2² + 3² + ... + N²)
2. Sum of cubes of numbers up to N (1³ + 2³ + 3³ + ... + N³)
Enter your choice (1/2):
2
Enter the value of N:
5
The sum of cubes of numbers up to 5 is: 225
```

Question 11: To write a shell program to check whether a given number is palindrome or not.

Answer 11:

```bash
#!/bin/bash
echo "Enter a number:"
read num
reverse=$(echo $num | rev)
if [ "$num" = "$reverse" ]; then
    echo "$num is a palindrome."
else
    echo "$num is not a palindrome."
fi
```

```
(base) navneetyadav@Navneets-MacBook-Air Assignment_2 % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q11.sh"
Enter a number:
656
656 is a palindrome.
```

Question 12: To write a program to check whether a login is connected or not.

Answer 12:

```bash
#!/bin/bash
echo "Enter the username to check if they are logged in:"
read username

if who | grep -w "$username" > /dev/null; then
    echo "User $username is currently logged in."
else
    echo "User $username is not logged in."
fi

```

```
(base) navneetyadav@Navneets-MacBook-Air Assignment_2 % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q12.sh"
Enter the username to check if they are logged in:
navneetyadav
User navneetyadav is currently logged in.
(base) navneetyadav@Navneets-MacBook-Air Assignment_2 % /bin/bash "/Users/navneetyadav/Desktop/OS_labs/Assignment_2/q12.sh"
Enter the username to check if they are logged in:
newlogin
User newlogin is not logged in.
```