

**LAB IMPLEMENTATION RECORD**

**OPERATING SYSTEM AND CONCEPTS**

BCSC 0856

**Institute of Engineering & Technology**

**B. TECH CS HONORS**

**(2022-23)**

**Submitted By Submitted To**

###### Shiva Srivastava Mr. Pappu Kumar Bhagat

###### (2115800023)

###### 

**Department of Computer Engineering & Applications**

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**Department of Computer Engineering and Applications,**

**GLA University, 17 km. Stone NH#2,**

**Mathura-Delhi Road, Chaumuha, Mathura – 281406, UP**

**CERTIFICATE**

This is to certify that I, **Shiva Srivastava**, have done hands-on implementation of all the practical’s mentioned in this Lab Implementation Record File under the supervision of **Mr. Pappu Kumar Bhagat,** I have submitted the file in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology (Computer Science & Engineering) Honors.

**Signature of Supervisor:**

**Name of Supervisor:** Mr. Pappu Kumar Bhagat

**Date: 02-05-2023**

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**Basic Problems on Bash Scripting Language:**

**Programs:**

1. Program to find the sum of square of individual digits of a number.

Program:

Result:

*#!/bin/bash*

*echo "Enter a number: "*

*read num*

*sum=0*

*while [ $num -gt 0 ]*

*do*

*digit=$(( num % 10 ))*

*sum=$(( sum + digit\*digit ))*

*num=$(( num / 10 ))*

*done*

*echo "Sum of square of digits: $sum"*

Enter a number:

1234

Sum of square of digits: 30

1. Program to find the sum of cube of individual digits of a number.

Program:

*#!/bin/bash*

*echo "Enter a number: "*

*read num*

*sum=0*

*while [ $num -gt 0 ]*

*do*

*digit=$(( num % 10 ))*

*sum=$(( sum + digit\*digit\*digit ))*

*num=$(( num / 10 ))*

*done*

*echo "Sum of cube of digits: $sum"*

Result:

Enter a number:

1234

Sum of cube of digits: 100

1. Program to execute various UNIX commands using case statements set of numbers.

Result:

*#!/bin/bash*

*echo "Enter a number corresponding to the command to execute:"*

*echo "1. List files in the current directory"*

*echo "2. Show the current date and time"*

*echo "3. Show the current user"*

*echo "4. Show the current working directory"*

*echo "5. Exit"*

*read num*

*case $num in*

*1) ls -l ;;*

*2) date ;;*

*3) whoami ;;*

*4) pwd ;;*

*5) exit ;;*

*\*) echo "Invalid input" ;;*

*esac*

Enter a number corresponding to the command to execute:

1. List files in the current directory

2. Show the current date and time

3. Show the current user

4. Show the current working directory

5. Exit

2

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1. Program to count the number of vowels in a line of text.

*#!/bin/bash*

*echo "Enter a line of text: "*

*read line*

*vowel\_count=0*

*for (( i=0; i<${#line}; i++ )); do*

*char="${line:$i:1}"*

*case $char in*

*([aeiouAEIOU])vowel\_count=$((vowel\_count+1)) ;;*

*esac*

*done*

*echo "Number of vowels: $vowel\_count"*

Result:

Enter a line of text:

The quick brown fox jumps over the lazy dog.

Number of vowels: 11

1. Program to display student grades.

*#!/bin/bash*

*echo "Enter the student's name: "*

*read name*

*echo "Enter the student's marks in 3 subjects (separated by spaces): "*

*read marks1 marks2 marks3*

*average=$(( (marks1+marks2+marks3) / 3 ))*

*echo "$name's grades:"*

*echo "Subject 1: $marks1"*

*echo "Subject 2: $marks2"*

*echo "Subject 3: $marks3"*

*echo "Average marks: $average"*

*if [ $average -ge 90 ]*

*then*

*echo "Grade: A+"*

*elif [ $average -ge 80 ]*

*then*

*echo "Grade: A"*

*elif [ $average -ge 70 ]*

*then*

*echo "Grade: B"*

*elif [ $average -ge 60 ]*

*then*

*echo "Grade: C"*

*else*

*echo "Grade: F"*

*fi*

Result:

Enter the student's name:

shiva srivastava

Enter the student's marks in 3 subjects (separated by spaces):

85 92 89

shiva srivastava's grades:

Subject 1: 85

Subject 2: 92

Subject 3: 89

Average marks: 88

Grade: A

6) Program to find the smallest number from a set of numbers:

*#!/bin/bash*

*# Read input numbers*

*read -p "Enter the numbers separated by space: " numbers*

*# Set the first number as the minimum*

*min=$1*

*# Iterate through the numbers and update the minimum value*

*for num in ${numbers[@]}*

*do*

*if [ $num -lt $min ]*

*then*

*min=$num*

*fi*

*done*

*# Print the minimum value*

*echo "The smallest number is: $min"*

Result:

Enter the numbers separated by space: 5 2 7 1 8

The smallest number is: 1

1. Program to find the smallest number from a set of numbers.

Program:

*#!/bin/bash*

*# Read input number*

*read -p "Enter a number: " num*

*# Set the first digit as the minimum*

*min=${num:0:1}*

*# Iterate through the digits and update the minimum value*

*for digit in $(echo $num | fold -w1)*

*do*

*if [ $digit -lt $min ]*

*then*

*min=$digit*

*fi*

*done*

*# Print the minimum value*

*echo "The smallest digit is: $min"*

Result:

Enter the numbers separated by space: 5 2 7 1 8

The smallest number is: 1

1. Program to find the smallest digit from a number.

Program:

*#!/bin/bash*

*# Read input number*

*read -p "Enter a number: " num*

*# Set the first digit as the minimum*

*min=${num:0:1}*

*# Iterate through the digits and update the minimum value*

*for digit in $(echo $num | fold -w1)*

*do*

*if [ $digit -lt $min ]*

*then*

*min=$digit*

*fi*

*done*

*# Print the minimum value*

*echo "The smallest digit is: $min"*

Result:

Enter a number: 72385

The smallest digit is: 2

1. Program to find all numbers between 50 and 100, which are divisible by 3 and not divisible

Program:

Result:

51 54 57 63 66 69 72 78 81 84 87 93 96 99

*#!/bin/bash*

*# Loop through numbers between 50 and 100*

*for (( i=50; i<=100; i++ ))*

*do*

*# Check if the number is divisible by 3 and not divisible by 5*

*if [ $(( i % 3 )) -eq 0 ] && [ $(( i % 5 )) -ne 0 ]*

*then*

*echo $i*

*fi*

*done*

1. Program to find the sum of digits of a number until a single digit is obtained.

Result:

*#!/bin/bash*

*# Read input number*

*read -p "Enter a number: " num*

*# Define function to compute the digit sum*

*function digit\_sum() {*

*local sum=0*

*for digit in $(echo $1 | fold -w1)*

*do*

*sum=$(( sum + digit ))*

*done*

*echo $sum*

*}*

*# Loop until the number becomes a single digit*

*while [ ${#num} -gt 1 ]*

*do*

*num=$(digit\_sum $num)*

*done*

*# Print the final single digit*

*echo "The sum of digits until a single digit is: $num"*

Enter a number: 789

The sum of digits until a single digit is: 6

1. Program to find the second highest number from a set of numbers.

Program:

*#!/bin/bash*

*# Initialize the array of numbers*

*nums=(23 45 11 56 89 4 76)*

*# Sort the array in descending order*

*sorted\_nums=($(printf '%s\n' "${nums[@]}" | sort -n -r))*

*# Find the second highest number*

*second\_highest=${sorted\_nums[1]}*

*echo "The second highest number is: $second\_highest"*

Result:

The second highest number is: 76