

C++ PROGRAMMING LAB



Prepared by:

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Roll No: 25_____

Batch: 2023-27

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Ex	List of Experiment
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p. No	
1	Write a program to find the roots of a quadratic equation.
2	Write a program to calculate the power of a number using a loop.
3	Write a program to check if a given string, is a palindrome.
4	Write a program that simulates a simple ATM machine, allowing users to check their balance, deposit, or withdraw money using a switch statement.
5	Write a program that finds the largest among three numbers using nested if-else statements
6	Write a program that determines the grade of a student based on their marks of 5 subjects using if-else-if ladder.
7	Write a program to find the sum of digits of a number until it becomes a single digit number.
8	Write a program to print a Pascal's triangle using nested loops.
9	Write a program to calculate the sum of series $1/1! + 2/2! + 3/3! + \dots + N/N!$ using nested loops.
10	Write a program to create an array of strings and display them in alphabetical order.
11	Write a program that checks if an array is sorted in ascending order.
12	Write a program to calculate the sum of elements in each row of a matrix.
13	Write a program to generate all possible permutations of a string.
14	<p>Create a C++ program to print the following pattern:</p> <pre> ***** * * * * * *</pre>

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15	<p>Write a C++ program to display the following pattern:</p> <pre> 1 232 34543 4567654 34543 232 </pre>
16	<p>Write a program to creating an inventory management system for a small store. The system should use object-oriented principles in C++. Your program should have the following features:</p> <ul style="list-style-type: none"> • Create a Product class that represents a product in the inventory. Each Product object should have the following attributes: <ul style="list-style-type: none"> • Product ID (an integer) • Product Name (a string) • Price (a floating-point number) • Quantity in stock (an integer) • Implement a parameterized constructor for the Product class to initialize the attributes when a new product is added to the inventory.
17	<p>Write a program to manage student records. Create a class Student with attributes such as name, roll number, and marks. Implement methods for displaying student details, adding new students, and calculating the average marks of all students in the record system.</p>
18	<p>Write a program that implements a basic calculator. Use a class Calculator with methods to perform addition, subtraction, multiplication, and division of two numbers. The program should allow the user to input two numbers and select an operation to perform.</p>
19	<p>Write a program to simulate a simple online shop. Create a class Product with attributes like name, price, and quantity in stock. Implement methods for adding products to the shopping cart, calculating the total cost, and displaying the contents of the cart.</p>

20	Write a program to manage student grades for a classroom. Create a class Student with attributes for student name and an array to store grades. Implement methods for adding grades, calculating the average grade, and displaying the student's name and grades. Use constructors and destructors to initialize and release resources.

Name of Student: Shikha singh

_____ **Roll Number: 25**

_____ **Experiment No:**

7

Title:

7. Write a program to find the sum of digits of a number until it becomes a single digit number.

Theory:

Input:

- The program starts by asking the user to input a positive integer.
- **Validation:**
 - It checks if the entered number is positive. If the number is not positive, it prompts the user to enter a positive number and exits with an error code.
- **Iteration:**
 - The program uses a while loop to iteratively add the numbers starting from the user-entered number until it becomes 1.
 - Inside the loop, the current userNumber is added to the sum, and then userNumber is decremented by 1.
- **Sum:**
 - The sum of the numbers is accumulated during each iteration of the loop.
- **Output:**
 - Finally, the program prints the sum of the numbers.

Code:

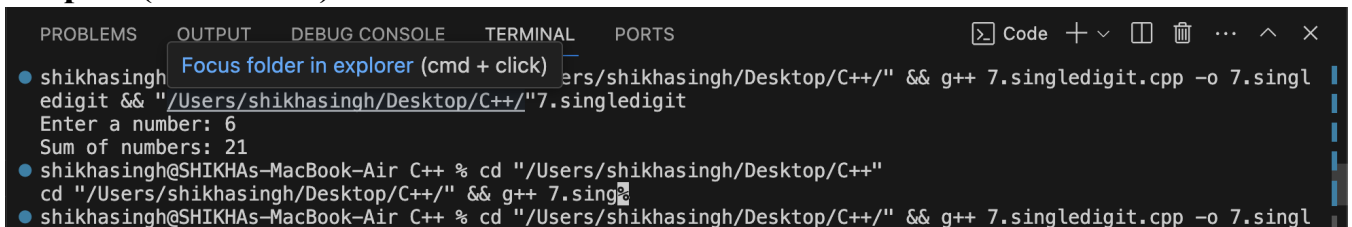
```
#include <iostream>
using namespace std;
int main() {

    cout << "Enter a number: ";
    int userNumber;
    cin >> userNumber;

    if (userNumber <= 0) {
        cout << "Please enter a positive number.\n";
        return 1;
    }
    int sum = 0;

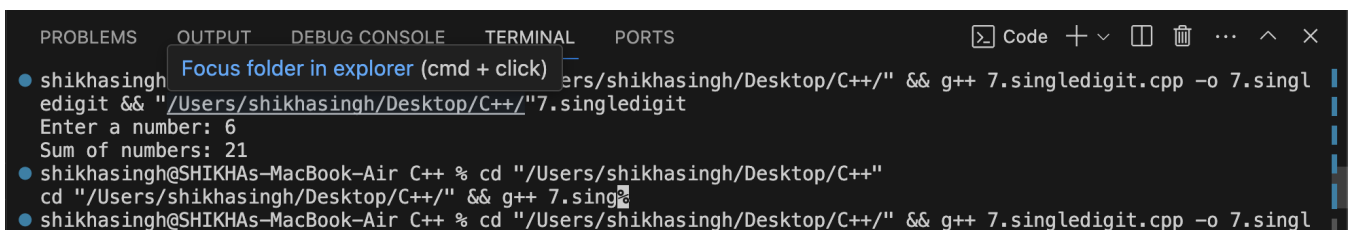
    while (userNumber != 0) {
        sum += userNumber;
        userNumber--;
    }
    cout << "Sum of numbers: " << sum << endl;
    return 0;
}
```

Output: (screenshot)



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
shikhasingh Focus folder in explorer (cmd + click) /Users/shikhasingh/Desktop/C++/" && g++ 7.singledigit.cpp -o 7.singl
edigit && "/Users/shikhasingh/Desktop/C++/"7.singledigit
Enter a number: 6
Sum of numbers: 21
shikhasingh@SHIKHAs-MacBook-Air C++ % cd "/Users/shikhasingh/Desktop/C++"
cd "/Users/shikhasingh/Desktop/C++/" && g++ 7.singl
shikhasingh@SHIKHAs-MacBook-Air C++ % cd "/Users/shikhasingh/Desktop/C++/" && g++ 7.singledigit.cpp -o 7.singl
```

Test Case: Any two (screenshot)



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
shikhasingh Focus folder in explorer (cmd + click) /Users/shikhasingh/Desktop/C++/" && g++ 7.singledigit.cpp -o 7.singl
edigit && "/Users/shikhasingh/Desktop/C++/"7.singledigit
Enter a number: 6
Sum of numbers: 21
shikhasingh@SHIKHAs-MacBook-Air C++ % cd "/Users/shikhasingh/Desktop/C++"
cd "/Users/shikhasingh/Desktop/C++/" && g++ 7.singl
shikhasingh@SHIKHAs-MacBook-Air C++ % cd "/Users/shikhasingh/Desktop/C++/" && g++ 7.singledigit.cpp -o 7.singl
```

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
shikhasingh@SHIKHAS-MacBook-Air C++ % cd "/Users/shikhasingh/Desktop/C++"
shikhasingh@SHIKHAS-MacBook-Air C++ % cd "/Users/shikhasingh/Desktop/C++/" && g++ 7.singl
edigit && "/Users/shikhasingh/Desktop/C++/"7.singledigit
Enter a number: 7
Sum of numbers: 28
shikhasingh@SHIKHAS-MacBook-Air C++ %
```

Conclusion: This program demonstrates

a basic use of a loop in C++ to perform

iterative addition. It emphasizes the

importance of validating user input to

ensure it meets the expected criteria. The

loop continues until the userNumber

becomes 1, and the sum of the numbers is

then printed.