

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.

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_____ **Experiment No:**

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Title:

6. Write a program that determines the grade of a student based on their marks of 5

subjects using if-else-if ladder.

Theory:

If-else-if ladder:

In C++, the if-else-if ladder is a series of if and else-if statements where each condition is checked sequentially. The first true condition encountered is executed, and subsequent conditions are ignored. This structure is useful for checking multiple conditions in a systematic manner.

2. Grade Determination:

The program calculates the average marks of 5 subjects and then uses an if-else-if ladder to determine the

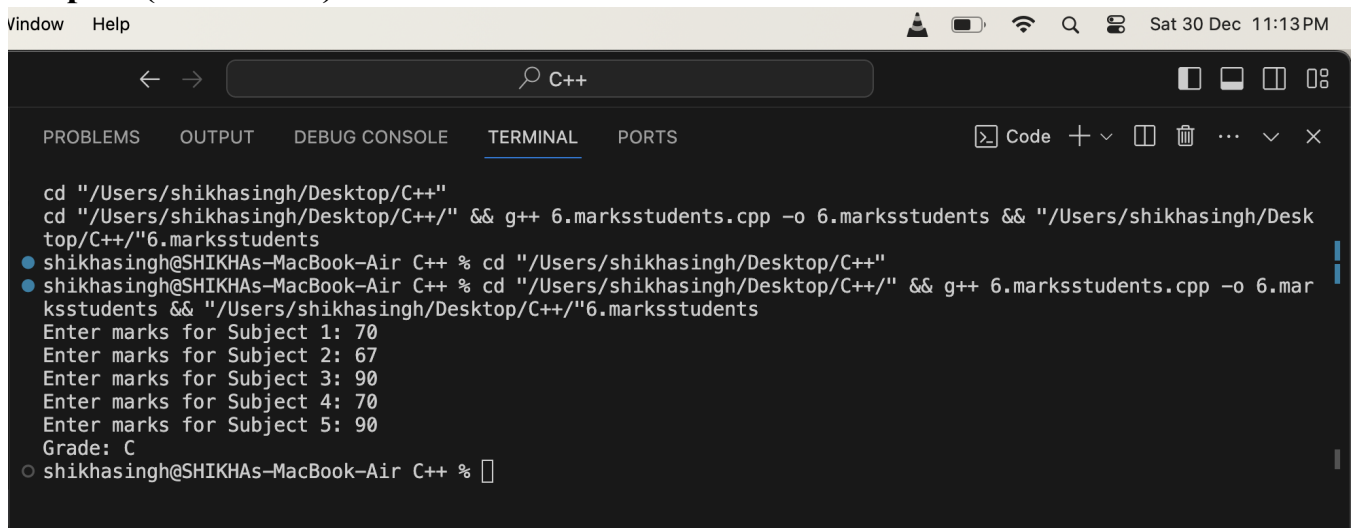
corresponding grade based on the average. The ladder is structured such that higher grades correspond to higher average marks.

Code:

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

    int subject1, subject2, subject3, subject4, subject5;
    cout << "Enter marks for Subject 1: ";
    cin >> subject1;
    cout << "Enter marks for Subject 2: ";
    cin >> subject2;
    cout << "Enter marks for Subject 3: ";
    cin >> subject3;
    cout << "Enter marks for Subject 4: ";
    cin >> subject4;
    cout << "Enter marks for Subject 5: ";
    cin >> subject5;
    float average = (subject1 + subject2 + subject3 + subject4 + subject5) / 5.0;
    if (average >= 90) {
        cout << "Grade: A\n";
    } else if (average >= 80) {
        cout << "Grade: B\n";
    } else if (average >= 70) {
        cout << "Grade: C\n";
    } else if (average >= 60) {
        cout << "Grade: D\n";
    } else {
        cout << "Grade: F\n";
    }
    return 0;
}
```

Output: (screenshot)



The screenshot shows a macOS terminal window with a dark background. The title bar at the top indicates the window is titled 'Window' and 'Help'. The system status bar at the top right shows the date and time as 'Sat 30 Dec 11:13 PM'. The terminal window has a search bar at the top with 'C++' entered. Below the search bar, there are tabs for 'PROBLEMS', 'OUTPUT', 'DEBUG CONSOLE', 'TERMINAL', and 'PORTS'. The 'TERMINAL' tab is selected. The terminal content shows the following commands and output:

```
cd "/Users/shikhasingh/Desktop/C++"  
cd "/Users/shikhasingh/Desktop/C++/" && g++ 6.marksstudents.cpp -o 6.marksstudents && "/Users/shikhasingh/Desktop/C++/"6.marksstudents  
shikhasingh@SHIKHAS-MacBook-Air C++ % cd "/Users/shikhasingh/Desktop/C++"  
shikhasingh@SHIKHAS-MacBook-Air C++ % cd "/Users/shikhasingh/Desktop/C++/" && g++ 6.marksstudents.cpp -o 6.marksstudents && "/Users/shikhasingh/Desktop/C++/"6.marksstudents  
Enter marks for Subject 1: 70  
Enter marks for Subject 2: 67  
Enter marks for Subject 3: 90  
Enter marks for Subject 4: 70  
Enter marks for Subject 5: 90  
Grade: C  
shikhasingh@SHIKHAS-MacBook-Air C++ %
```

Test Case: Any two (screenshot)

