

National University of Computer and Emerging Sciences



Laboratory Manual

for

Programming Fundamentals

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Lab Manual 02

Introduction

Objectives

After performing this lab, students shall be able to:

Write C++ programs with understanding of sequences, arithmetic operators including increment/decrement, shorthand /longhand, and data types.

Problems / Assignments

Problem 1:

Declare 3 variables of type `int`, calculate the average and store in variable of type `float`. Take the input from user. Divide the average with a random number. Check if the result is Even.

(Note: Do the task without using if -else)

Problem 2:

Take four variable of type String from the user and concatenate them using + operator.

Problem 3:

Write the code to find the size of following Variables:

- Int
- String
- Char
- Float
- Double
- Long int
- Short int

Problem 4:

Take the string from user convert it into int. Display the string and int together.

Problem 5:

Read 6 numbers and display percentage of even numbers and odd numbers.

Problem 6:

Convert your first name into ASCII and check if it's Odd or Even. Do the following Tasks:
Increase the ASCII value 4 times using ++ operator and convert back in string

Decrease the ASCII value 4 times using -- operator and convert back in string
(Note: Do the task without using if -else)

Problem 7:

Write a program that takes salary of a user and do the following tasks:

1. Calculate the gross salary for next 5 years with each year 3% increment and 1.5% tax deduction
2. Calculate the gross salary for next 5 years with each year 14% increment and 10% tax deduction
3. Calculate the gross salary for each off the next 5 years with 1st year 3% increment and 1.5% tax deduction in 2nd 14% increment and 10% tax deduction, 3rd year 3% increment and 1.5% tax deduction, 4th year 14% increment and 10% tax deduction and 5th year 3% increment and 1.5% tax deduction, also calculate the total gross salary for all 5 years and tell if it's even or odd.

(Note: Do the task without using if -else)

Brainstorming Activity:

1. 100 people stand in a circle in order 1 to 100. No. 1 has a sword. He kills the next person (i.e., No. 2) and gives the sword to the next living person (i.e., No. 3). All people do the same until only 1 survives. Which number survives to the end?

2. Using only a 4 minute and 7-minute hourglass or egg timer how would you measure exactly 9 minutes?

3. There are 100 light bulbs lined up in a row in a long room. Each bulb has its own switch and is currently switched off. The room has an entry door and an exit door. There are 100 people lined up outside the entry door. Each bulb is numbered consecutively from 1 to 100. So is each person.

Person No. 1 enters the room, switches on every bulb, and exits. Person No. 2 enters and flips the switch on every second bulb (turning off bulbs 2, 4, 6...). Person No. 3 enters and flips the switch on every third bulb (changing the state on bulbs 3, 6, 9...). This continues until all 100 people have passed through the room.

What is the final state of bulb No. 64? And how many of the light bulbs are illuminated after the 100th person has passed through the room?

4. Three humans, one big monkey and two small monkeys are to cross a river:
Only humans and the big monkey can row the boat.
At all times, the number of humans on either side of the river must be greater or equal to the number of monkeys on that side. (Or else the humans will be eaten by the monkeys!)
The boat only has room for 2 (monkeys or humans).
Monkeys can jump out of the boat when it's banked.