Columbia College
Vancouver, Canada

Introduction to Computer Science and Programming 1
CSCI120

Chapter1-Lab

Note: This document has been designed and developed as part of an initiative for creating an OER (Open Education Resource) package for the course CSCI 120 at Columbia College.

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Requirements

- For each of the following problems,
  - Design an algorithm
  - Draw a flowchart to represent the algorithm
  - Test your flowchart using the tracing table (hand tracing approach) using one or two sample inputs.
- To provide the answer you can
  - Either use just a pen and paper and please scan your papers and insert it in the designated area on this paper.
  - Or you can use www.draw.io online tool to create the flowchart and export the image and insert it here.

# Of Students in the Group:		
Student 1	*First name, last name*	*Student-ID*
Student 2	*First name, last name*	*Student-ID*
Student 3	*First name, last name*	*Student-ID*
Student 4	*First name, last name*	*Student-ID*

Problem1

Design a flowchart and algorithm that takes three numbers such as Num1, Num2 and Num3 and finds the minimum number between all three input numbers.

Problem2

- Design an algorithm and a flowchart which receives a number and prints all numbers to which the input number is divisible. For instance, if the input is 20, then the algorithm should return 1,2,4,5,10,20, because number 20 is divisible to all these numbers.

Problem3

- Design an algorithm and a flowchart which receives a number and calculate the total sum of all numbers from 1 to the input numbers. For instance, if the user has entered number 8, the flowchart calculates the total numbers from 1 to 8 which 1+2+3+4+5+6+7+8 = 36

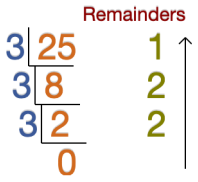
Problem4

- Design an algorithm and a flowchart that receives a number and converts the number to base 3. For instance, if the user enters 25 then it converts 25 to base 3 which is

$$(25)_{10} = (221)_3$$

DESCRIPTIONS

Divide the number repeatedly by 3 until the quotient becomes 0.



- When 25 is divided by 3, the quotient is 8 and the remainder is 1.
- When 8 is divided by 3, the quotient is 2 and the remainder is 2.
- When 2 is divided by 3, the quotient is 0 and the remainder is 2.

Write the remainders **from bottom to top**.

$$(25)_{10} = (221)_3$$

Reference: https://madformath.com/calculators/basic-math/base-converters/decimal-to-base-3-converter-with-steps/decimal-to-base-3-converter-with-steps

Problem5

- Design an algorithm and a flowchart which receives a number in base 2 from input and converts it to base 10.