UNIVERSITY OF CALOOCAN CITY
COMPUTER ENGINEERING DEPARTMENT

Data Structure and Algorithm

Laboratory Activity No. 2

Algorithm Analysis and Flowchart

Submitted by:
Villanueva, Bryan O.

Instructor:
Engr. Maria Rizette H. Sayo

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I. Objectives

Introduction

Data structure is a systematic way of organizing and accessing data, and an algorithm is a step-by-step procedure for performing some task in a finite amount of time. These concepts are central to computing, but to be able to classify some data structures and algorithms as “good,” we must have precise ways of analyzing them.

This laboratory activity aims to implement the principles and techniques in:

- Writing a well-structured procedure in programming
- Writing algorithm that best suits to solve computing problems to improve the efficiency of computers
- Convert algorithms into flowcharting symbols

II. Methods

A. Explain algorithm and flowchart

B. Write algorithm to find the result of equation: $f(x) = \begin{cases} -x, & x<0 \\ x, & x \geq 0 \end{cases}$ and draw its flowchart

C. Write a short recursive Python function that finds the minimum and maximum values in a sequence without using any loops

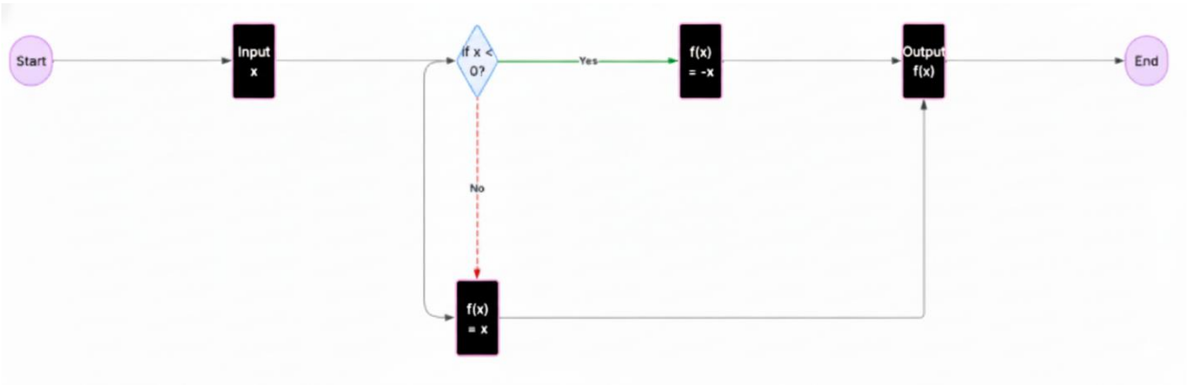
III. Results

A. The flowchart and algorithm show how to get the absolute value of a number. First, a number x is entered. Then the program checks a condition: if x is less than 0, it changes the value to -x to make it positive. If x is already 0 or above, the value stays the same. After that, the final non-negative value is displayed. Both the algorithm and the flowchart outline this step-by-step method of turning any number into its positive form.

B.

1. Start
2. Input a number, let's call it x.
3. Check if x is less than 0.
4. If it is, then f(x) is -x.
5. Otherwise (if x is greater than or equal to 0), f(x) is x.
6. Output the result, f(x).
7. End

C.



IV. Conclusion

In this activity, I was able to understand the importance of writing clear procedures, choosing the right algorithm, and converting them into flowcharts. By practicing these skills, I learned how to organize data better and how to solve problems in a more efficient way. This helped me see how proper algorithms and flowcharts can make programming easier and more effective. Overall, the activity improved my understanding of data structures and algorithms and how they are used in real computing tasks.