Data Structure and Algorithm

Laboratory Activity No. 2

Algorithm Analysis and Flowchart

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# 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

# Methods

* 1. Explain algorithm and flowchart

-x, x<0

x, x ≥ 0

* 1. Write algorithm to find the result of equation: f (x) = and draw its flowchart
  2. Write a short recursive Python function that finds the minimum and maximum values in a sequence without using any loops

# Results

A.

An algorithm is a set of clear and step-by-step instructions that are followed to solve a particular problem or to perform a task. Also written in a way that even someone without technical knowledge can understand. Algorithms are also written by pseudocode to help plan the logic before writing code.

Flowchart is a visual representation of an algorithm. It uses by shape like ovals, arrow and etc. To show the step by steps and flow of the process.

B.

1.Start  
2. Read Value of x  
3. Check if x < 0  
4. If YES, set f = -x  
5. If NO, set f= x  
6. Display value of f  
7. End

A diagram of a function

AI-generated content may be incorrect.

Figure 1 Screenshot of program

This flowchart shows the step-by-steps it will start from start then we going to input x and next step if the x is less than 0 if Yes it will show the f= -x it means it the value will be negative if No it show f=x the value is positive after verify the value the next step will be display the value and the last is the end.

C.

A screenshot of a computer program

AI-generated content may be incorrect.  
Figure 2 Screenshot of program

This code does not use any loops because the recursive function is to solve the problem and it’s breaking down the list into smaller parts and comparing the values and it will be step-by-step.

# Conclusion

The conclusion expresses the summary of the whole laboratory report as perceived by the authors of the report.

In this task I learned or helped me to build a strong logic like the flowchart that I make not only logic and also problem solving and basic programming techniques.

**References**

W3Schools Python Recursion: <https://www.w3schools.com/python/gloss_python_function_recursion.asp>

Python Programming: An Introduction to Computer Science by John Zelle

https://www.krishnagudi.com/wp-content/uploads/2023/05/Python-Programming-An-Introduction-to-Computer-Science-John-M.-Zelle.pdf