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

Present the visualized procedures done. Also present the results with corresponding data visualizations such as graphs, charts, tables, or image . Please provide insights, commentaries, or explanations regarding the data. If an explanation requires the support of literature such as academic journals, books, magazines, reports, or web articles please cite and reference them using the IEEE format.

Please take note of the styles on the style ribbon as these would serve as the style format of this laboratory report. The body style is Times New Roman size 12, line spacing: 1.5. Body text should be in Justified alignment, while captions should be center-aligned. Images should be readable and include captions. Please refer to the sample below:

Image

Figure 1 Screenshot of program

If an image is taken from another literature or intellectual property, please cite them accordingly in the caption. Always keep in mind the Honor Code [1] of our course to prevent failure due to academic dishonesty.

**(A.) 1.0 ALGORITHM**

The word Algorithm means "*A set of finite rules or instructions to be followed in calculations or other problem-solving operations*" Or "*A procedure for solving a mathematical problem in a finite number of steps that frequently involves recursive operations"*. (geeksforgeeks.org)

Algorithm is a structured or systematic procedure that is followed in creating a program in order to run it think of it as a cooking recipe if you will not follow the recipe and procedures provided by that book you won’t be able to cook a dish properly unless you follow it’s procedure you will have a good and satisfying result.

**(A.) 1.1 FLOWCHART**

Flowcharts are graphical representations of data, algorithms, or processes, providing a visual approach to understanding code. (geeksforgeeks.org). Flowchart is another structured/systematic procedure that programmers used before doing the coding part but it uses shapes and lines as visuals and they used it to have a visualization of how the program will function and what will the program look like.

**(B.) ALGORITHIM & FLOWCHART VISUALIZATION**

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**(C.) RECURSSIVE CODE SNIPPET**

**A screen shot of a computer program

AI-generated content may be incorrect.**

# Conclusion

# Understanding of algorithms and their visual representation through flowcharts is crucial for effective programming. F(x) demonstrates a systematic approach to problem-solving, which is essential for translating a logical procedure into code. Similarly, the recursive Python function for finding the minimum and maximum values shows how algorithms can be implemented into code to solve problems efficiently without relying on traditional loops. All three components algorithm, flowchart, and code work together to provide a comprehensive method for developing and understanding computational solutions.

**References**

[1] Co Arthur O.. “University of Caloocan City Computer Engineering Department Honor Code,” UCC-CpE Departmental Policies, 2020.

GeeksforGeeks, “What is an Algorithm | Introduction to Algorithms,” *GeeksforGeeks*, Jul. 11, 2025. <https://www.geeksforgeeks.org/dsa/introduction-to-algorithms/>

GeeksforGeeks, “What is a Flowchart and its Types?,” *GeeksforGeeks*, Apr. 07, 2025. <https://www.geeksforgeeks.org/computer-science-fundamentals/what-is-a-flowchart-and-its-types/>