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

An flowchart is a visual presentation of an algorithm using symbols or shapes to illustrate each step clearly. On the other hand, Algorithm is an step by step process used to solve a problem or perform a task written in a logical sequence. Those two are helpful to us, programmers to furthermore understand how a program should work by breaking down complex problems into easier parts.

B.

Algorithm:

**Start**: Begin the process.

**Input:** Get a numerical value, which we'll call x.

**Check Condition:** Determine if x is less than 0.

**If YES:** If x is negative, set the output value f(x) to −x (which makes it positive).

**If NO:** If x is zero or positive, set the output value f(x) to x.

**Output:** Display the final value of f(x).

**End:** Terminate the process.

A diagram of a function

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Figure 1 Screenshot of program

This image shows the flowchart that find the value of function f(x). It shows how the decision works. In this flowchart it checks if x is less than 0, if the user input a number that higher than 0, it goes straight to output, If not, it turns to condition of yes.

C.

A screenshot of a computer program

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Figure 2 Screenshot of program

The image shows a Python program that uses recursion to find the minimum and maximum values in a list. It compares each element with the rest of the list step by step until it finds the smallest and largest values, without using any loops. The result is printed at the end.

# Conclusion

In conclusion, algorithm and flowchart are essential in programming and programming. An algorithm makes a clear and logical sequence of steps to accomplish an complex problem, while a flowchart are connected in algorithm but representing it visually making it more easier to understand the process. Together, they create a good foundation in constructing a programming that benefits especially to beginners. It also serves to reduce errors making less time constructing your program.

**References**

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