Data Structure and Algorithm

Laboratory Activity No. 3

Translating Algorithm to Program

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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 tasks 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
* Writing an efficient Python program from translated algorithms

# Methods

• Design an algorithm and the corresponding flowchart (Note: You may use LucidChart or any application) for adding the test scores as given below if the number is even: 26,49,98,87,62,75

• Translate the algorithm to a Python program (using Google Colab)

• Save your source codes to GitHub

# Results

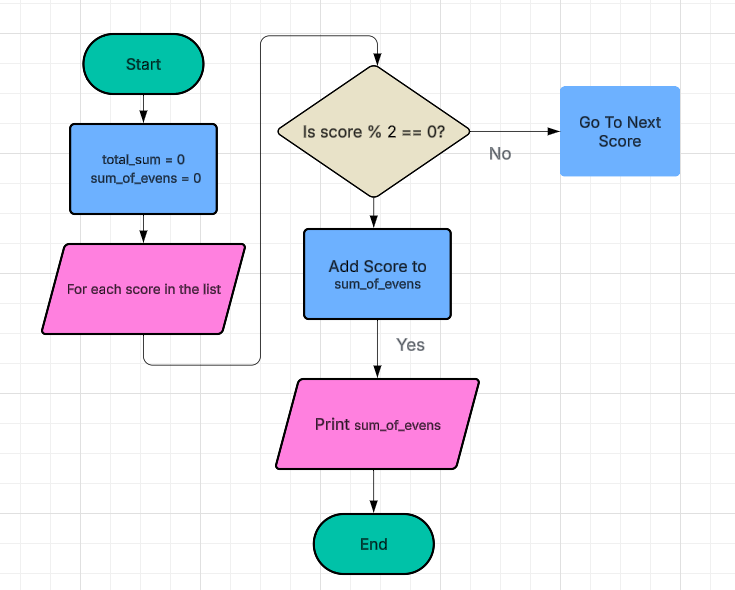


Figure 1 Screenshot of program

This flowchart shows how a program adds only the even numbers from a list of scores. It starts with a total of zero, then checks each score one by one. If a score is even (can be divided by 2 with no leftovers), the program adds it to the total. If it's not even, it skips that number and moves to the next one. After going through all the scores, the program shows the final total of the even numbers and then ends.

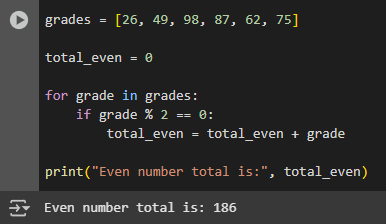


Figure 2 Screenshot of program

grades = [26, 49, 98, 87, 62, 75]

total\_even = 0

for grade in grades:

if grade % 2 == 0:

total\_even = total\_even + grade

print("Even number total is:", total\_even)

This program looks at a list of numbers (which are grades) and adds up only the even ones. It starts with a total of zero. Then, it checks each number in the list. If the number can be divided by 2 with no leftovers (that means it's even), the program adds it to the total. At the end, it shows the total of all the even numbers.

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:

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.

# Conclusion

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

During this exercise, we created a basic set of instructions (an algorithm) to sum only the even numbers on a list of exam scores.

The algorithm goes through each score individually. When the number is even (such as 26 or 98), it includes that number in the total. Otherwise, it skips it.

We also created a flowchart to illustrate how the steps take place in sequence. This allows us to visualize easily how the computer proceeds with the steps: checking, deciding, and adding.

We did the programming in Python. The code runs well and sums up all even scores. We can also modify it easily for using different numbers the next time!

**References**

[1] Admin and Admin, “Flowchart to find the sum of even numbers from 1 to n,” *TestingDocs.com*, Dec. 14, 2024. <https://www.testingdocs.com/questions/flowchart-to-find-the-sum-of-even-numbers-from-1-to-n/?utm_source=chatgpt.com>