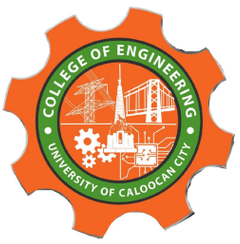
UNIVERSITY OF CALOOCAN CITY
COMPUTER ENGINEERING DEPARTMENT



Data Structure and Algorithm

Laboratory Activity No. 3

Translating Algorithm to Program

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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 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

II. 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

III. Results

Algorithm

1. Start
2. Input test_scores
3. If test_scores % 2 = 0, then find the sum
4. Output the sum

Flowchart

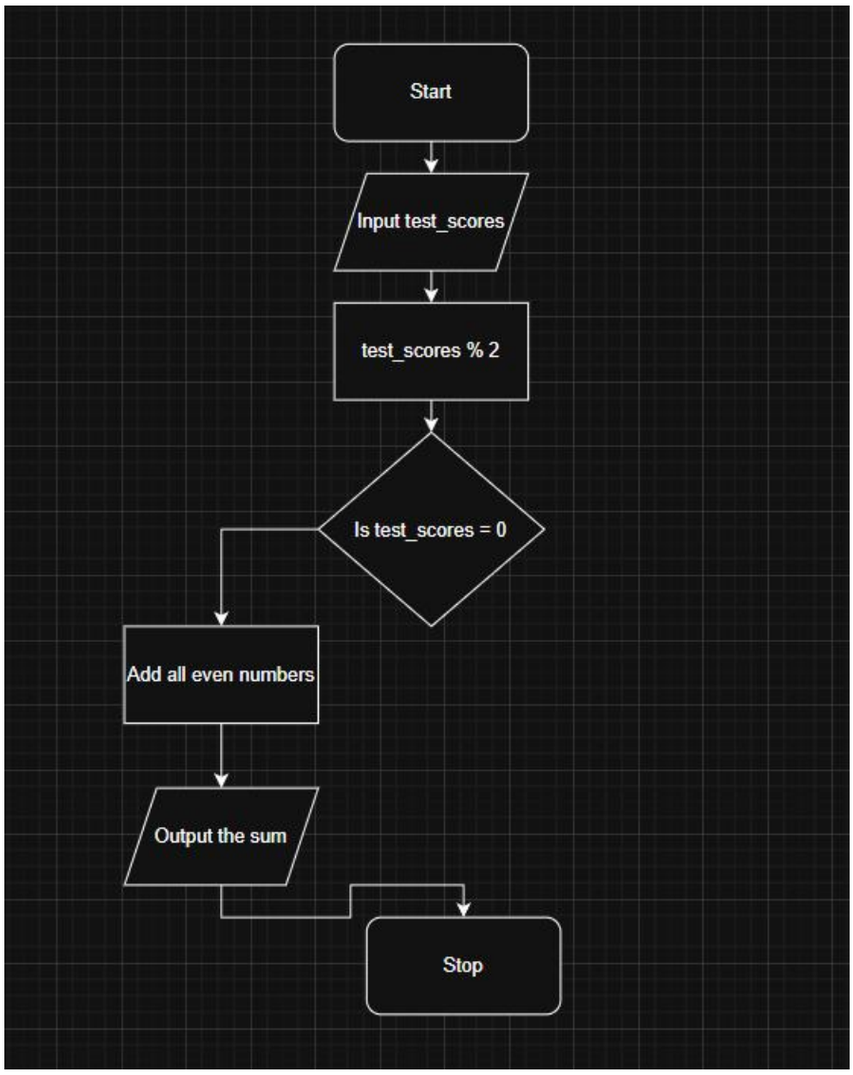

Figure 1. Flowchart

The flowchart starts by taking a list of test scores. It then goes through each score one by one and checks if the score is an even number by seeing if it can be divided by 2 without a remainder. If the score is even, the flowchart adds it to a total sum. After checking all the scores, it shows the final sum of all the even numbers and then stops. This process helps to find the total of just the even test scores from the list.

```
test_scores = [26, 49, 98, 87, 62, 75]
sum = 0

for scores in test_scores:
  if scores % 2 == 0:
    sum += scores

print(f"The sum of all even scores is {sum}.")
```

```
The sum of all even scores is 186.
```

Figure 2. Source Code

The python source code goes through a list of test scores and adds up only the even numbers. It starts with a total sum of zero and checks each score one by one. If a score is even (meaning it can be divided by 2 with no remainder), it adds that score to the total sum. After checking all the scores, the code prints out the total sum of all the even scores.

IV. Conclusion

This laboratory activity made me go back on how to use the algorithm for planning and the use of flowchart to visualize especially on if-else statements. On turning the algorithm and flowchart into python code. It made me go back to basics such as looping the list which this time is called test_scores and by checking if its even or odd by using the modulo operator if the output is 0 or any other numbers. I also incremented it to add all even numbers and printing the sum of all even numbers by using the f-string since i'm combining strings with the variable. Overall, this laboratory activity enhances my basics and to go back and master the use of algorithm and flowchart on solving a problem.

References

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