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 That Add Even Numbers**

```
# sum variable
sum = 0

# List of test scores
numbers = [26, 49, 98, 87, 62, 75]

# Loop through each number in the list
for number in numbers:
    # Check if the number is even
    if number % 2 == 0:
        # Add even number to the sum
        sum = sum + number

print("The sum of even numbers is:", sum)
```

```
The sum of even numbers is: 186
```

Figure 1 screenshot of program

This code shows a simple way to find the sum of even numbers from a list. It starts by setting the total sum to 0, then checks each number in the list one by one using a loop. Inside the loop, it checks if a number is even by using `number % 2 == 0`. If it's even, the number gets added to the total sum. After the loop, it prints the final result. In this case, the list is `[26, 49, 98, 87, 62, 75]`. The even numbers here are 26, 98, and 62. When we add them together, we get 186, which matches the output.

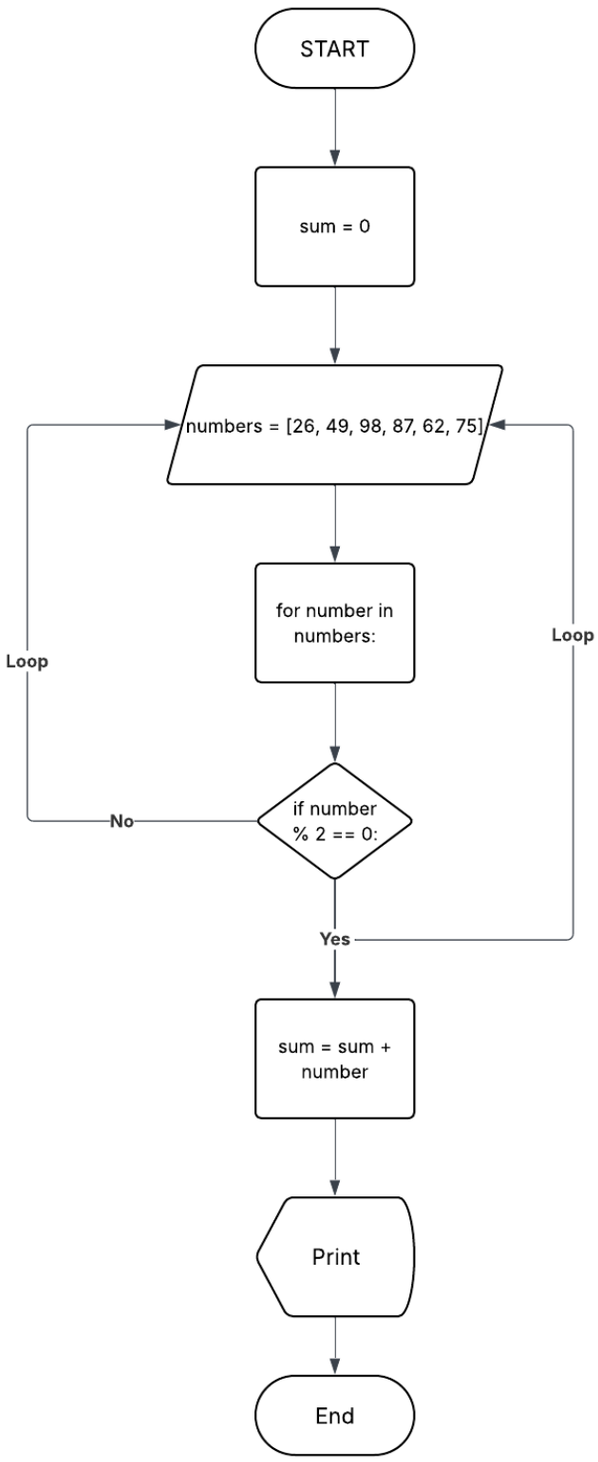


Figure 2 flowchart

This flowchart shows how to find the sum of all even numbers in a list. First, the program starts by setting the sum to 0. Then, it creates a list of numbers: [26, 49, 98, 87, 62, 75]. Next, the program goes through each number in the list one by one. For every number, it checks if the number is even. A number is even if when divided by 2, the remainder is 0. If it's even, the program adds it to the total sum. If it's odd, the program just skips that number and goes to the next one. After checking all the numbers, the program prints the final value of the sum, which is the total of all the even numbers. Then, the program ends.

## Algorithm

Step 1: Start

Step 2: Set sum = 0

Step 3: Create a list called numbers = [26, 49, 98, 87, 62, 75]

Step 4: For each number in numbers, do the following:

a. If number % 2 == 0:

   i. Add number to sum

b. Else:

   i. Skip the number

Step 5: Print the value of sum

Step 6: End

# IV. Conclusion

In this lab activity, I learned how to solve a problem by using an algorithm and turning it into a Python program. I made a step by step plan to add only the even numbers from a list. Then, I wrote the program in Python and it worked correctly. I also made a flowchart to show how the steps work. This activity helped me practice writing clear instructions and turning them into code. I also learned how important it is to plan before coding. I was able to follow the objectives and finish the task properly.

# References

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

[2] Real Python, “Python ‘for’ Loops (Definite Iteration),” *Realpython.com*, Jan. 30, 2019. https://realpython.com/python-for-loop/