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

```
Step 1: Start
Step 2: Initialize, scores = [26, 49, 98, 87, 62, 75]
Step 3: Declare that sum = 0
Step 4: Declare that index = 0
Step 5: While index < length of scores:
   If scores[index] is even
      Add scores to sum
      Print scores[index]
   Increment index by 1
Step 6: Output sum
Step 7: End
```

We first have to initialize the scores of the test using a list data type, then we’ll set the variable of sum to 0, and the index to 0 it’ll check first if the index is less than the length of the list. Then we’ll check if it's odd or not it will add to the sum of the number until all of the scores are checked then it will print the output.

Flowchart

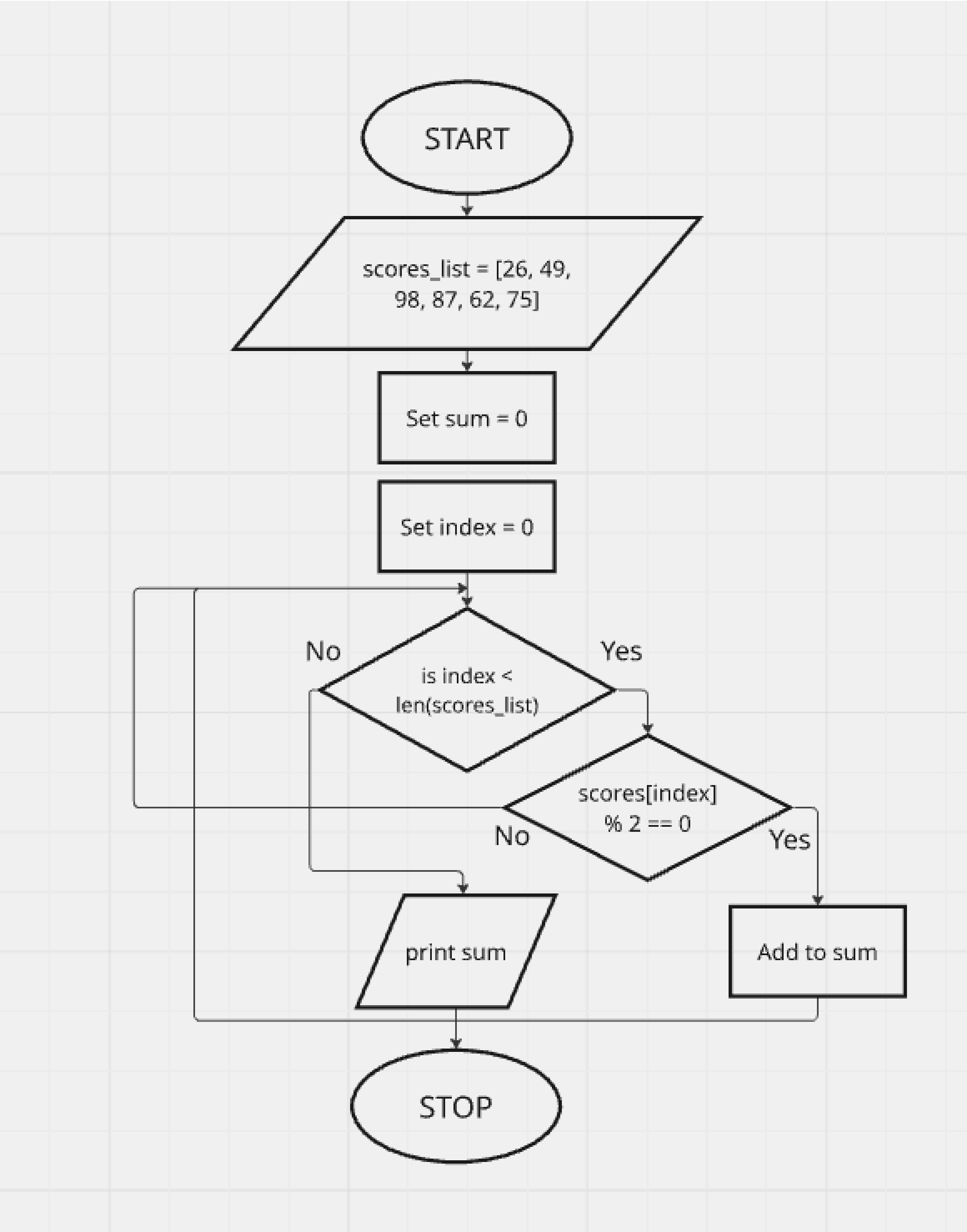
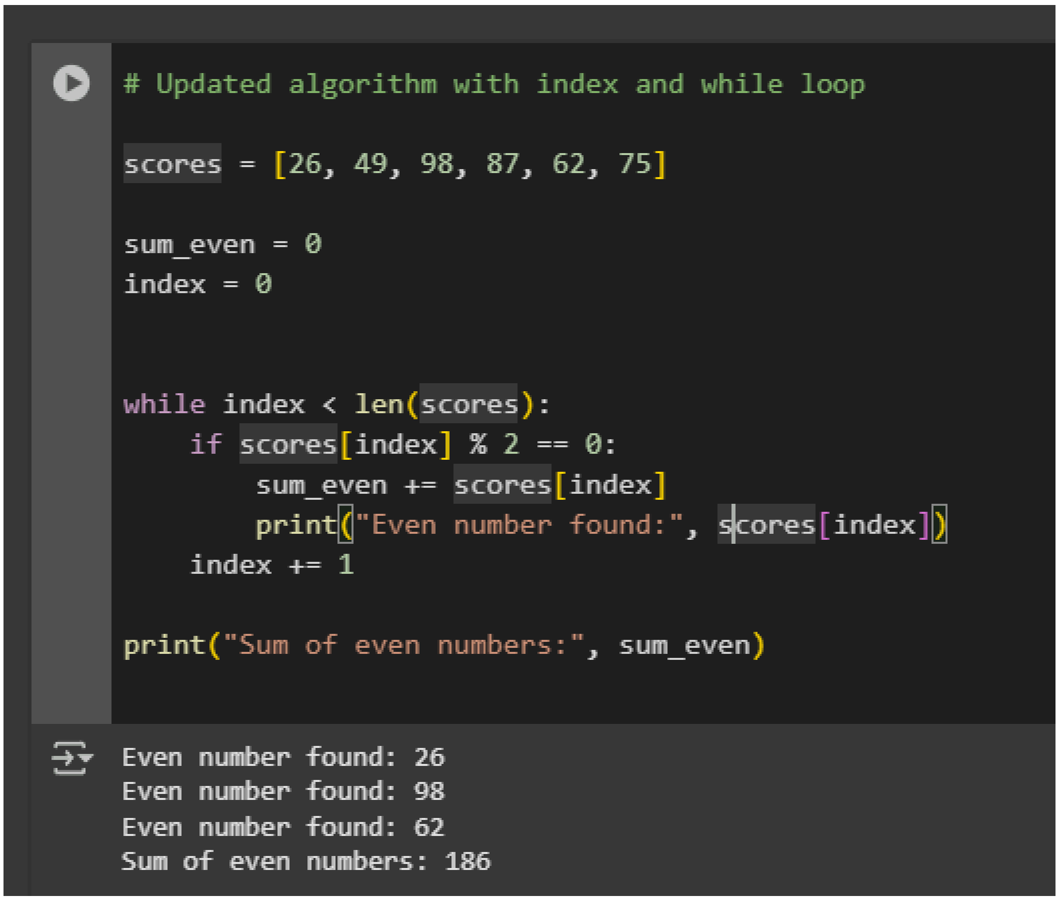


Figure 1 Flowchart

Source Code



```python
# Updated algorithm with index and while loop

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

sum_even = 0
index = 0


while index < len(scores):
    if scores[index] % 2 == 0:
        sum_even += scores[index]
        print("Even number found:", scores[index])
    index += 1

print("Sum of even numbers:", sum_even)
```

```
Even number found: 26
Even number found: 98
Even number found: 62
Sum of even numbers: 186
```

Figure 2 Source code of the program

I used a modulo to determine if the scores in a number is even or an odd, if true it will add to the sum of the scores.

IV. Conclusion

I’ve learned about how to use the list in a practical manner, in a way that makes solving those scores more efficient. I’ve better understood the use of algorithm and flowchart in making the workflow much better in programming.

References

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