Japan Advanced Institute of Science and Technology

Information Science School

I116 – Fundamental Programing

Assignment Report

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Introduction

I use Jupiter notebook for writing code and presenting my idea for all final assignments

Some of advantages can be listed:

- **Suitable for presenting algorithm implementation**: write code (Python), documents (Markdown), show figures
- **Portable**: Run on browser, user only need a major browser to run and view a notebook
- **Not need to re-interpret source code for grading**

It's better to view the compiled notebook on Github, I have a Github repository that contains all my notebooks: https://github.com/m-inh/i116-assignments

Some answers of the teacher's requirements can be shown in notebook. The detailed answer is listed as below:

1. BASIC INFORMATION
This action is done in this report.

2. PROBLEM STATEMENT
This action is explained in all notebooks.

Every notebook has a short paragraph that describes the purpose of the program and contains teacher's requirements.

3. INPUT AND OUTPUT FORMAT
This action is explained in all notebooks.

Every Python function in my notebooks has comments that declare what the input and output are. In some important functions, I have more detailed information why I do that, and how the function works.

4. VARIABLE DESCRIPTION
This action is explained in all notebooks.

Like the 3rd section.

5. ALGORITHM DESCRIPTION
This section is explained in all notebooks.

6. STRUCTURE DIAGRAM
This section is explained in this report.

7. ERROR INDICATIONS
This section is explained in this report. (if needed)

8. HAND TRACE
This action is explained in all notebooks.

I wrote functions in order of flow of my thinking. After each main block in notebooks, I wrote tests to ensure that every function in these blocks runs correctly.

9. EXTRA CREDIT
This section is explained in this report. (if needed)

10. CORRECTNESS ARGUMENT
This section is explained in this report. (if needed)

11. LISTINGS
All files are notebooks and this report.

12. COMPILATION TYPESCRIPT
Not need to conduct compilation. Because all blocks of code are run in previous session and printed out the result if needed.

13. TEST DESCRIPTION
This action is explained in all notebooks.

14. TEST TYPESCRIPTS
This action is explained in all notebooks.

15. KNOWN BUGS
This section is explained in this report. (if needed)

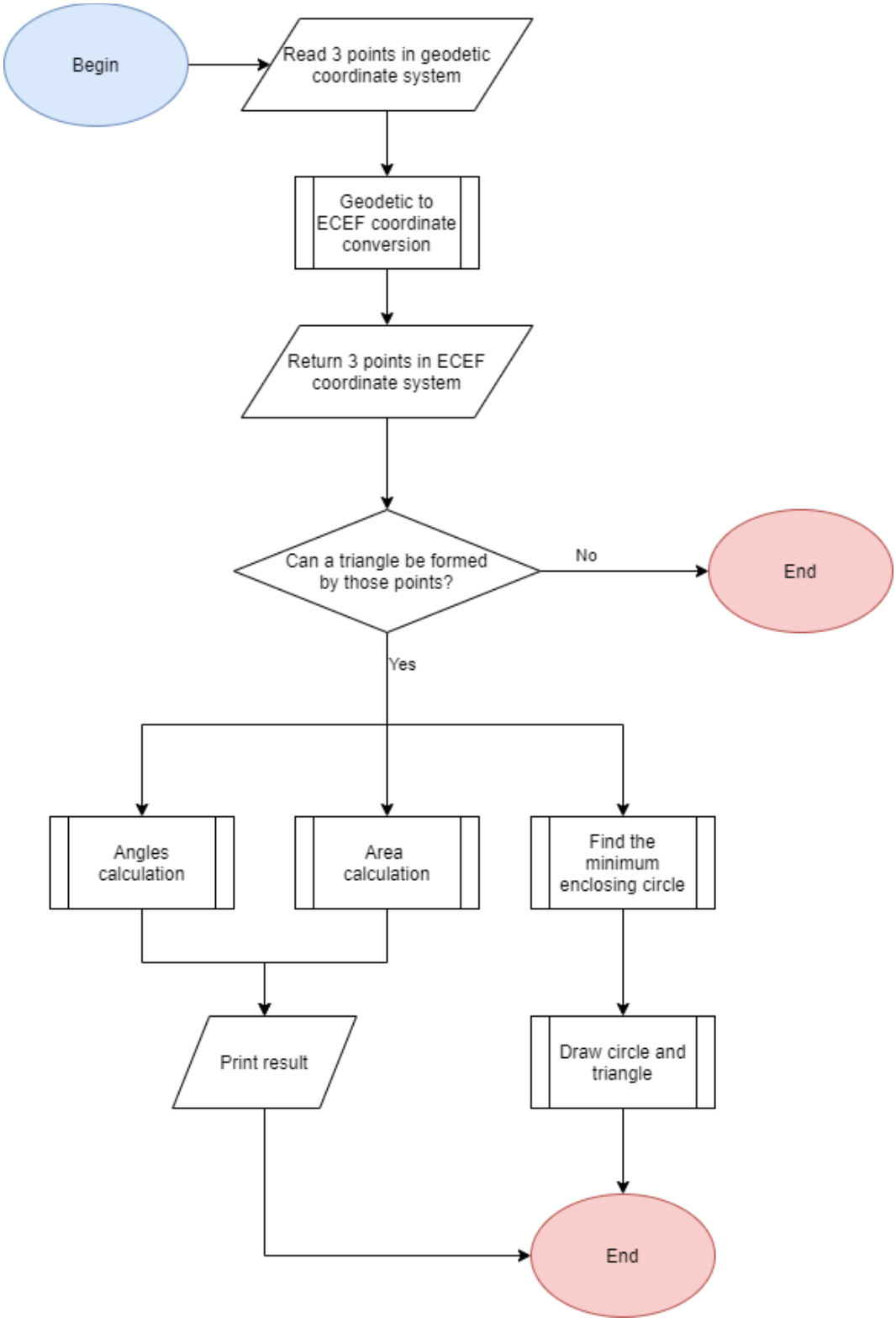
16. POSSIBLE IMPROVEMENTS
This section is explained in this report. (if needed)

17. COMMENTS
This section is explained in this report. (if needed)

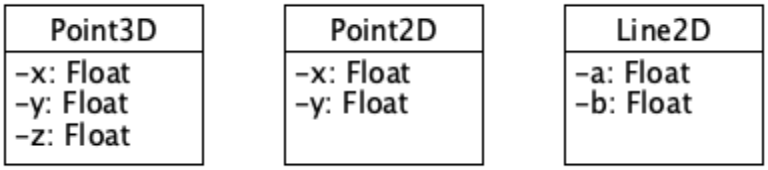
Project 1

Notebook link: https://github.com/m-inh/i116-assignments/blob/master/project_1.ipynb

STRUCTURE DIAGRAM



CLASS DIAGRAM



CORRECTNESS ARGUMENT

Because all functions in this assignment is followed by mathematical theory, so the algorithm must be correct

EXTRA CREDIT

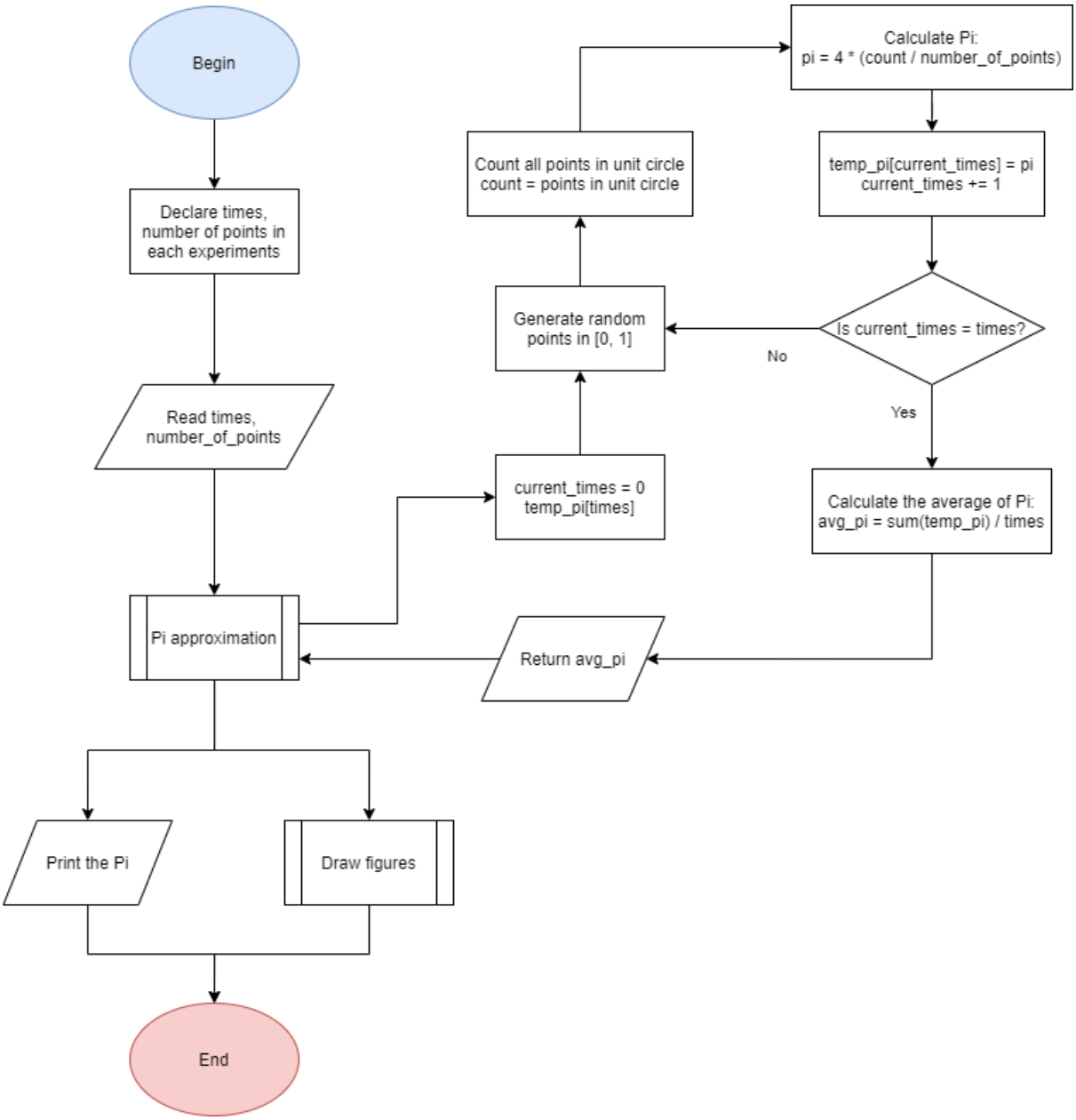
POSSIBLE IMPROVEMENTS

COMMENTS

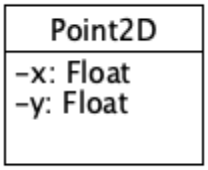
Project 2

Notebook link: https://github.com/m-inh/i116-assignments/blob/master/project_2.ipynb

STRUCTURE DIAGRAM



CLASS DIAGRAM



CORRECTNESS ARGUMENT

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EXTRA CREDIT

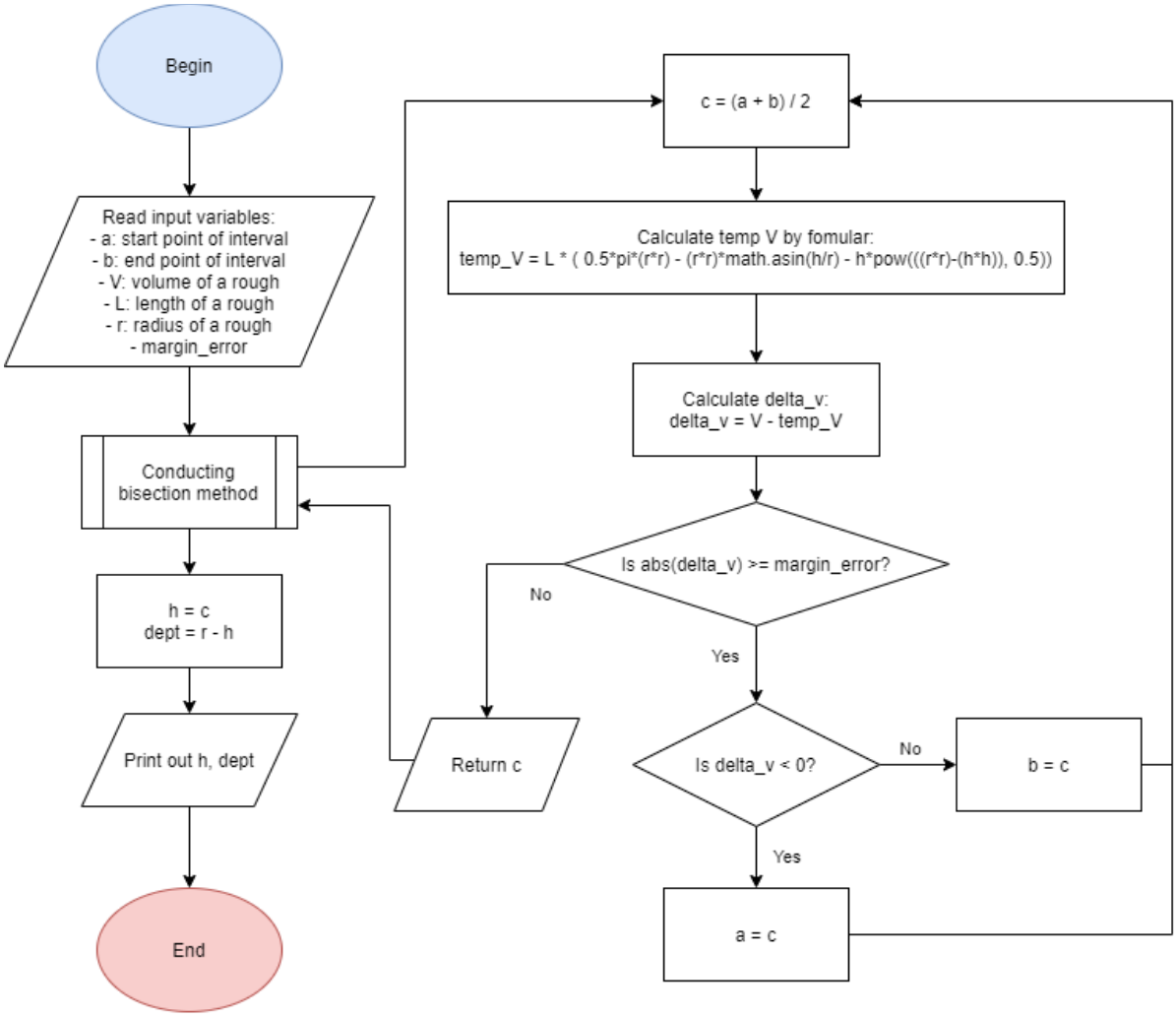
POSSIBLE IMPROVEMENTS

COMMENTS

Project 3

Notebook link: https://github.com/m-inh/i116-assignments/blob/master/project_3.ipynb

STRUCTURE DIAGRAM



CORRECTNESS ARGUMENT

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EXTRA CREDIT

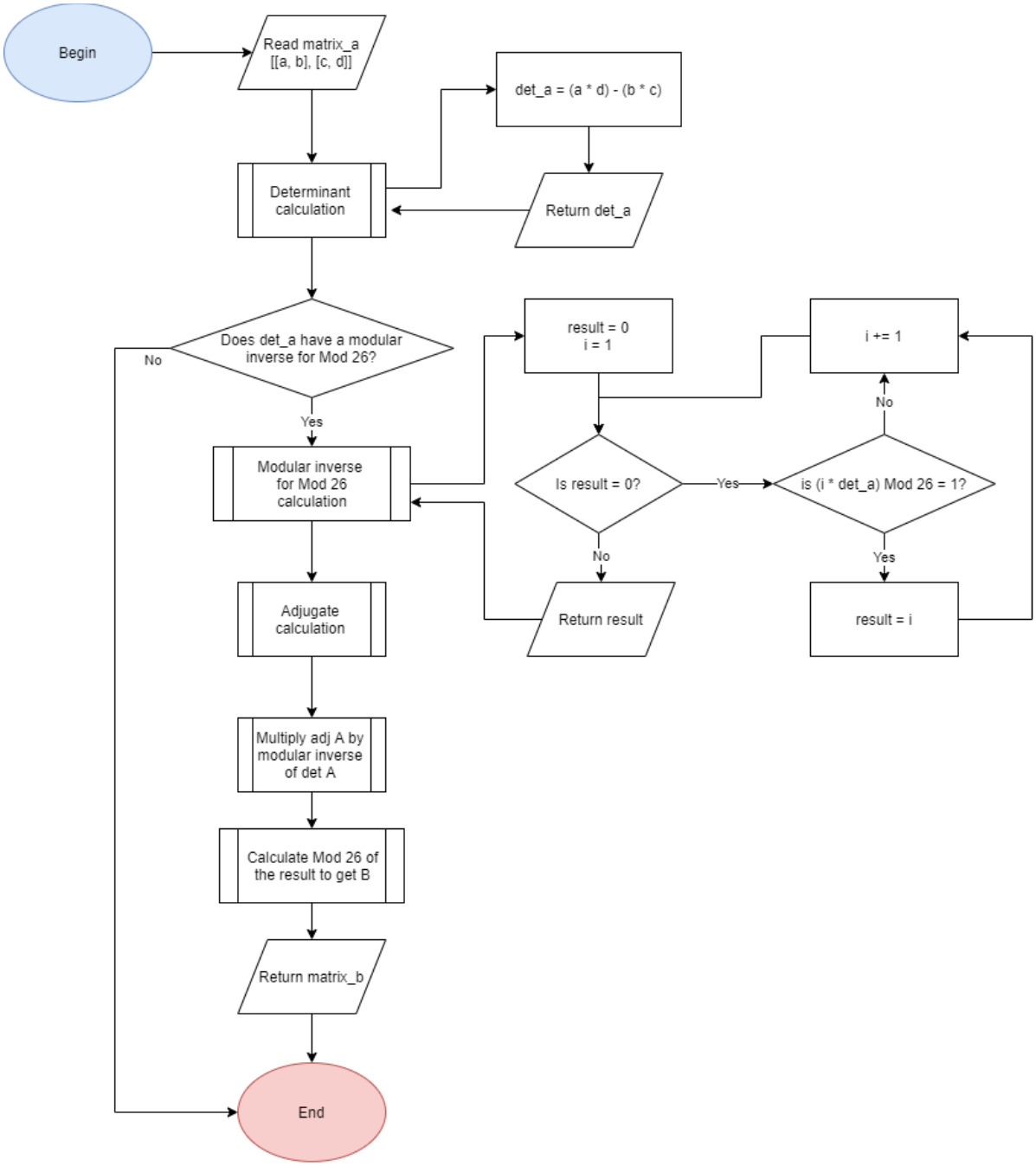
POSSIBLE IMPROVEMENTS

COMMENTS

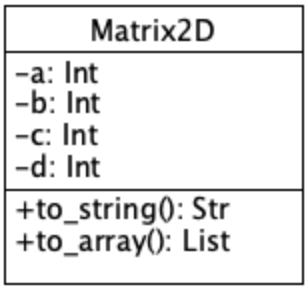
Project 4

Notebook link: https://github.com/m-inh/i116-assignments/blob/master/project_4.ipynb

STRUCTURE DIAGRAM



CLASS DIAGRAM



CORRECTNESS ARGUMENT

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POSSIBLE IMPROVEMENTS

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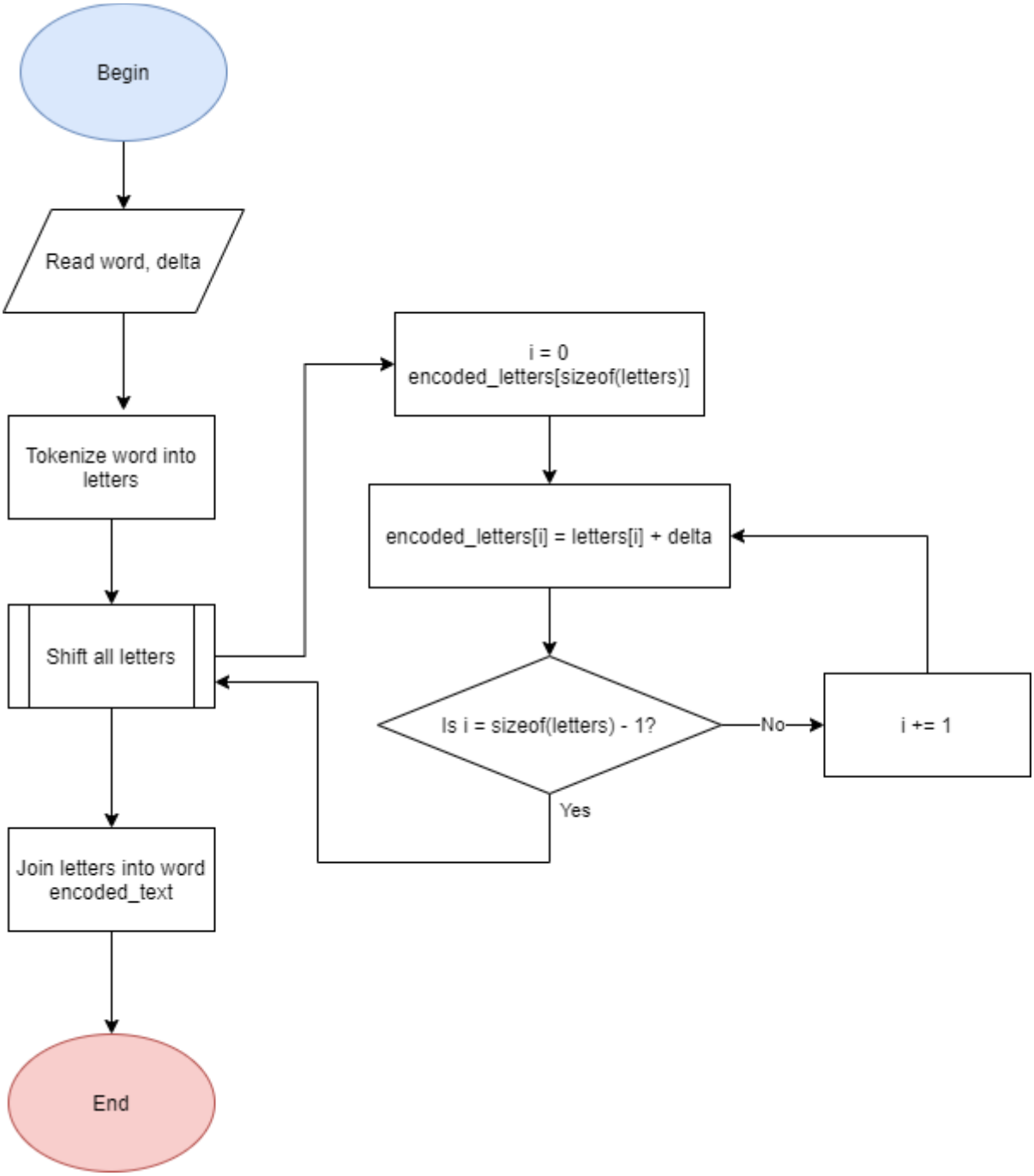
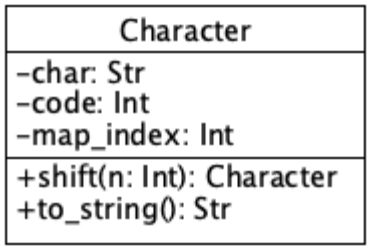
Project 5

Notebook link: https://github.com/m-inh/i116-assignments/blob/master/project_5.ipynb

STRUCTURE DIAGRAM



CLASS DIAGRAM



EXTRA CREDIT

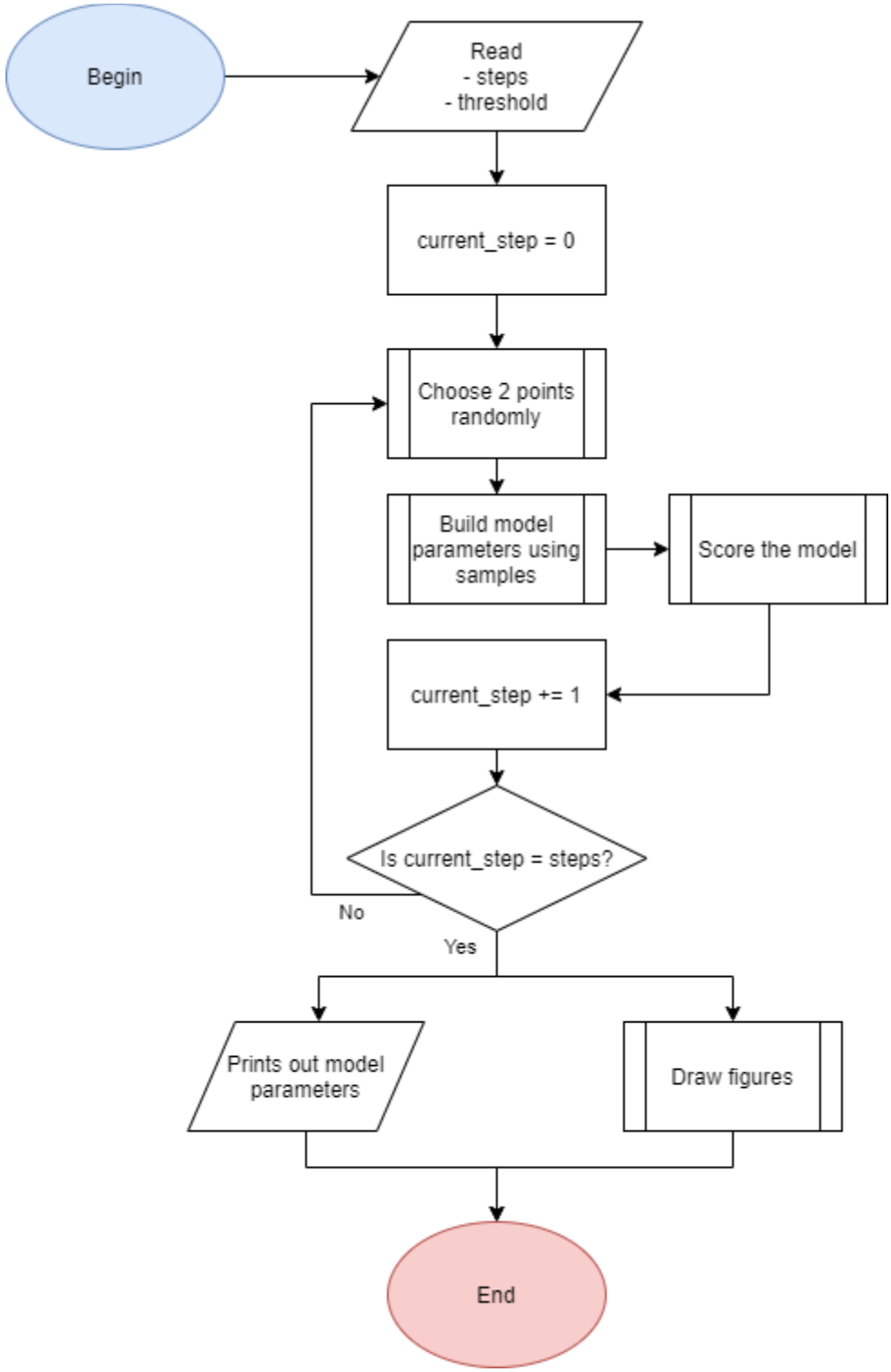
POSSIBLE IMPROVEMENTS

COMMENTS

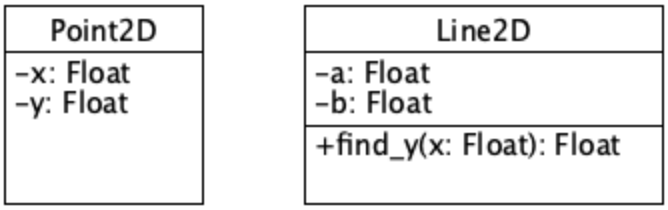
Project 6

Notebook link: https://github.com/m-inh/i116-assignments/blob/master/project_6.ipynb

STRUCTURE DIAGRAM



CLASS DIAGRAM



EXTRA CREDIT

POSSIBLE IMPROVEMENTS

COMMENTS