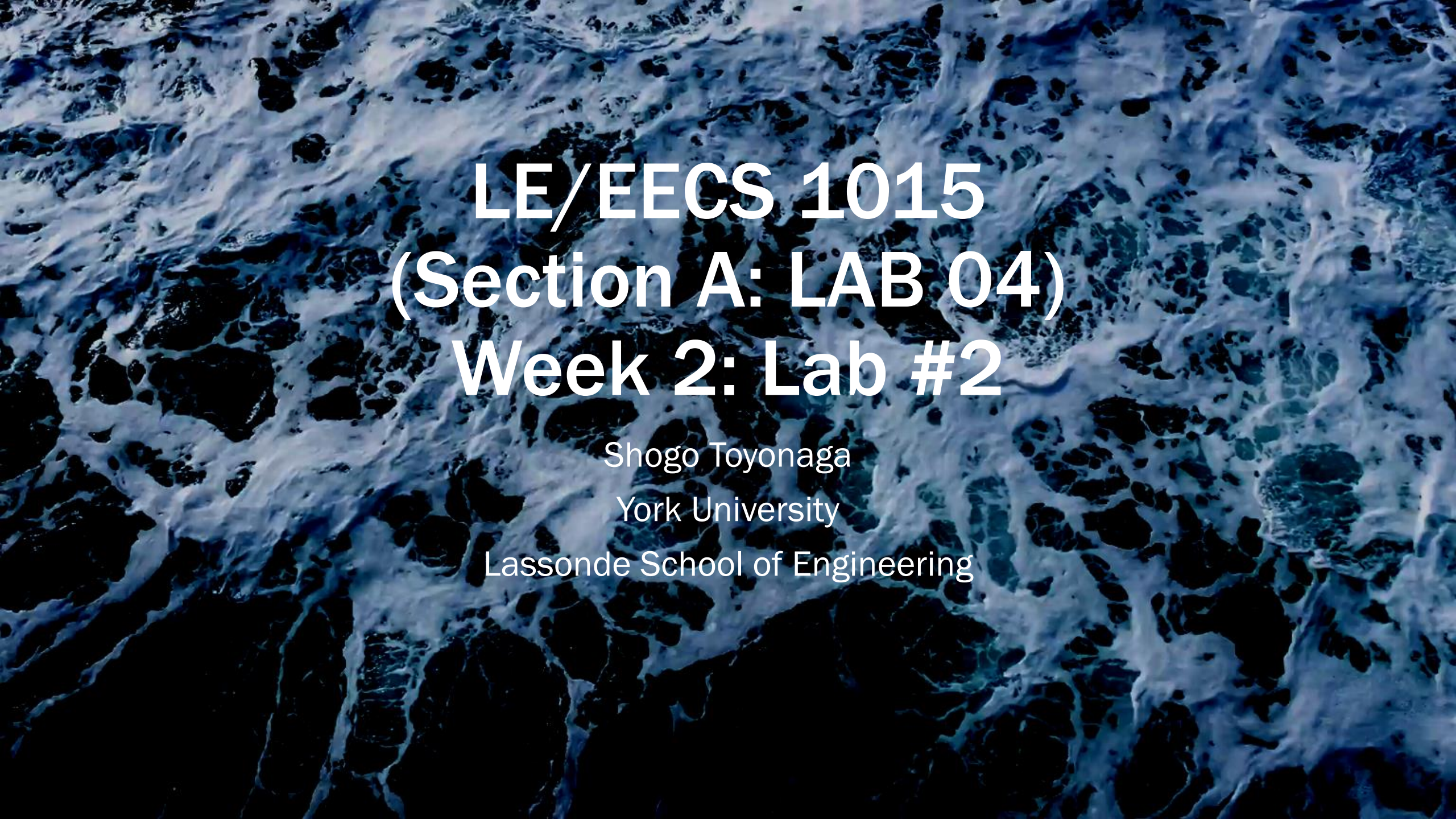

LE/EECS 1015 (Section A: LAB 04) Week 2: Lab #2

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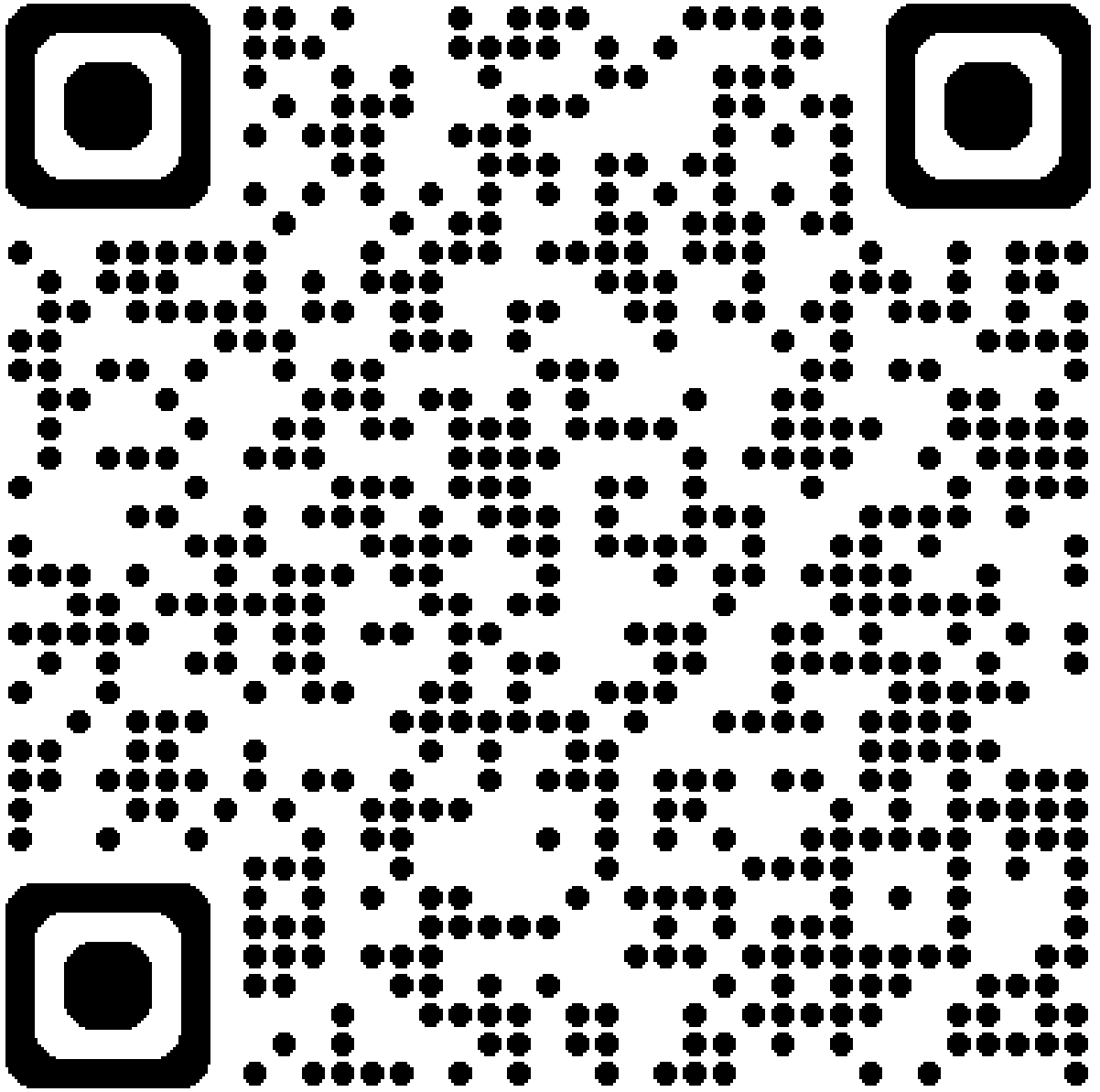
All of my slides & tutorial notebooks will be available through the following GitHub repository:

https://github.com/Shogz-Labs/EECS1015_F24_Assets



Goals of Lab 2

1. Using what you have learnt from *Basic building blocks (I-II),* write a simple script with primary components

2. Learning to **debug** with Wing IDE (Recommended) or PyCharm

Debugging

“Debugging is the process of finding and fixing errors or bugs in he source code of any software”

Wing IDE & PyCharm have tools to help you find bugs and squash them.

- Breakpoints allow you to interrupt the execution of your code at a certain place to view data values and assignments.
- The stack data allows us to see variable values and assignments at run-time. This can help us see line-by-line where things go wrong.

Debugging (Terminology & Operations)

Step into current execution point, or start debugging at first line (F7)

Step over current statement (F6)

Step out of current function or method (F8)

File Edit Source Project Debug Tools Window Help

Desktop\sample-program.py | Sandbox\sample-program.py

(bottom)

```python
def search_list(input: list, target: int) -> int:
    """Given a list, return the index of target. If target is not in the list, return -1."""
    for item in input:
        if item == target:
            return item
    return -1

test_case_1 = [1, 2, 3, 4, 5]
target = 25

print(search_list(test_case_1, target))
```

Search in Files | Search | Stack Data

<no debug process stack>

Options

Debug I/O | Exceptions | Python Shell | Messages | OS Commands

No debug process

Options

Project | Source Assistant | Call Stack | Source Browser | Indentation

Symbol: None

No symbol at cursor

Concept Review

1. Fundamentals of High-Level Programming
    - Literals, Operators, Expressions
        - BEDMASS!
    - Variables, Assignment, Memory Model
    - Statements, Functions
    - Application Programming Interface (APIs)
    - Booleans & Logical Operations (LE/EECS 1019)
    - Strings (Representation, Escape Characters, Operations, Methods, & Formatting)
2. Fundamental Principles
    - Documentation (Readability, Simplicity, and Comments)
        - Especially important because of dynamic typing!
    - Design Patterns
        - Precondition, Loop Invariant, Postcondition

Concept Review (String I)

- String indexing always starts from **0**! In general, we always index the first item in an array, list, etc., starting from $[0..n)$ for n items.
  - Python supports **negative indexing**.
- You can obtain a substring of a string by using the following syntax: $string\_variable[start:end:step]$ where $[start, end)$ and $step$ is 1 by default
  - The start, end, or step can be **omitted** to indicate the **default** value.

Concept Review (String II)

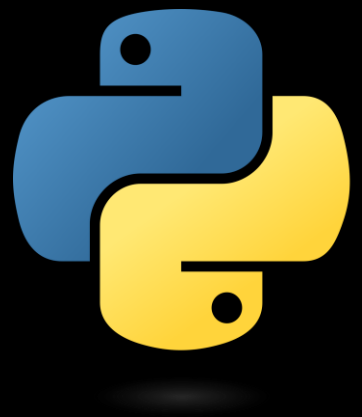
- Strings are immutable (cannot be changed after being defined)
- Strings are objects
- The String class supplies multiple supported methods:
  - e.g., str_variable_name.capitalize()

Concept Review (String Methods)

1. str.capitalize(self, /) – Make the first character have upper case and the rest lower case.
2. str.casefold(self, /) – Return a version of the string suitable for caseless comparisons.
3. str.lower(self, /) – Return a copy of the string converted to lowercase.
4. str.swapcase(self, /) – Convert uppercase characters to lowercase and lowercase characters to uppercase.
5. str.title(self, /) – Return a version of the string where each word is title-cased.
6. str.upper(self, /) – Return a copy of the string converted to uppercase.
7. str.isalnum(self, /) – Return True if the string is an alpha-numeric string, False otherwise.
8. str.isnumeric(self, /) – Return True if the string is a numeric string, False otherwise.
9. str.isalpha(self, /) – Return True if the string is an alphabetic string. False otherwise.
10. str.islower(self, /) – Return True if the string is a lowercase string, False otherwise.
11. str.isupper(self, /) – Return True if the string is an uppercase string, False otherwise.

1. str.count(substring) – Return the number of non-overlapping occurrences of the substring in str.
2. str.find(string) – Return the lowest index in str where string is found. Return -1 on failure.
3. str.endswith(string) – Returns true if str ends with the specified suffix, False otherwise.
4. str.index(string) – Return the lowest index in str where substring string is found. Raises ValueError when string is not found in str.
5. str.startswith(string) – Return True if str starts with string. False otherwise.
6. str.replace(self, old, new, count=-1, /) – Return a copy with all occurrences of substring old replaced by new.
7. str.strip(self, chars=None, /) – Return a copy of the string with leading and trailing whitespaces removed. If chars is given and not None, remove characters in chars instead.

What You Will Need



Lab 2 – Objectives

1. Follow the Steps (/30)
2. Debugging (/30)
3. Implementation (Donuts) (/10)
4. Implementation (Grade Calculator) (/10)
5. Implementation (BMI Calculator) (/10)
6. Implementation (MinMax Average) (/10)

Thank You!

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