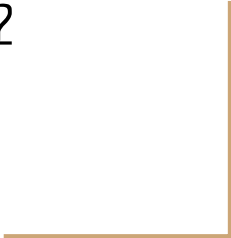# Programming, Problem Solving, and Algorithms

CPSC203, 2022 W2

Announcements

- **Lab2 is this week**
  - Due Friday at 6 PM !
- **POTW3 has been extended to next week**
  - There are still concepts/setup we haven't yet covered in some of the problems
- **Test 2 is next week**
  - It will be on content discussed last week (Class 2A, 2B, POTW 2), and practiced this week (Lab 2)
  - Some content from this week will be covered on the quiz
  - Reservations are now open! Take 1 min to do book your reservation now

Book a session for Test 2

Today's Plan…

1. Announcements! (5 mins)

2. Reminder about Tech Stack (1 min)

3. Software Design: Ingenuity and Simplicity (5 mins)

4. Finish up Data Class (10 mins)

5. Handcraft (50 mins)

6. Questions (10 mins)

Note: You should finish the tech stack BEFORE doing POTW!

Overview of the Tech Stack

Tech Stack

For any computer science (or data science) course, several tools and software packages are needed for this course. These tools are not usually included on your computer, and if they are, some configuration is necessary. This page links out to a guide (depending on your operating system) to install the "Tech Stack" for CPSC 203. A "Tech Stack" is the complete set of tools and technologies needed to accomplish a particular task, in this case, Data Analytics.

As you go through the install guides, remember that perhaps the two most important things you will learn in this course is how to troubleshoot things and achieve familiarity and proficiency with your computer. Be patient, read things carefully, do not be afraid to try things, it's unlikely you will do anything to irreversibly break your computer! Almost everything you do (you're on your own if you decide to take a hammer to your laptop!) can be undone, don't be afraid to ask your peers, TAs, and the instructor on Ed Discussion.

This is an exciting time for you as you begin your Software Development journey!

Install the Software Stack

Below are links to the software installation guide used for CPSC 203 for the three operating systems that are currently supported.

- macOS
- Windows
- Ubuntu

Attribution

Software Design: Ingenuity and Simplicity

Steve Jobs:

Simplicity is the ultimate sophistication. It takes a lot of hard work to make something simple, to truly understand the underlying challenges and come up with **elegant** solutions. [...] It's not just minimalism or the absence of clutter. It involves digging through the depth of complexity. To be truly simple, you have to go really deep. [...] You have to understand the essence of a product in order to be able to get rid of the parts that are not essential.
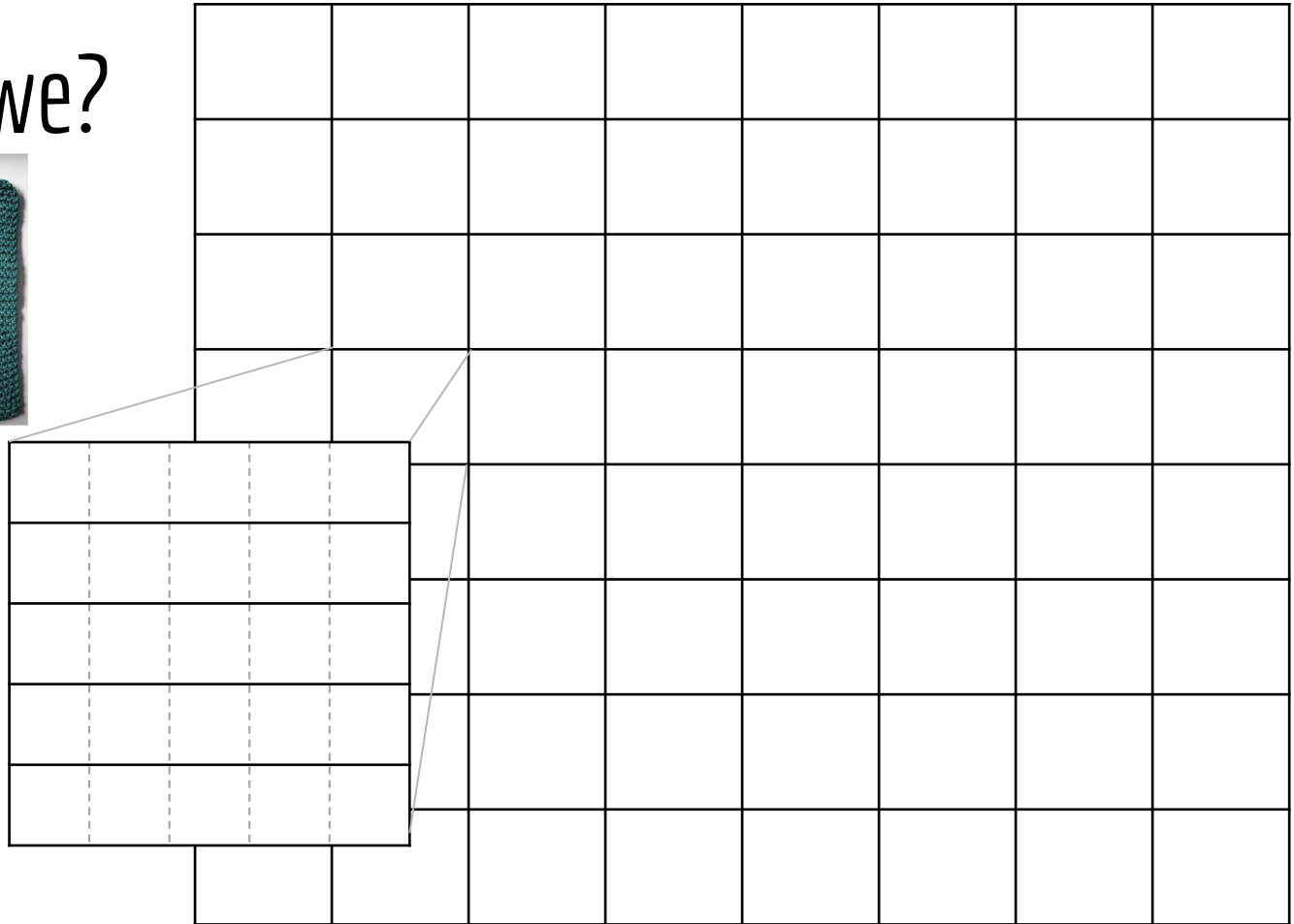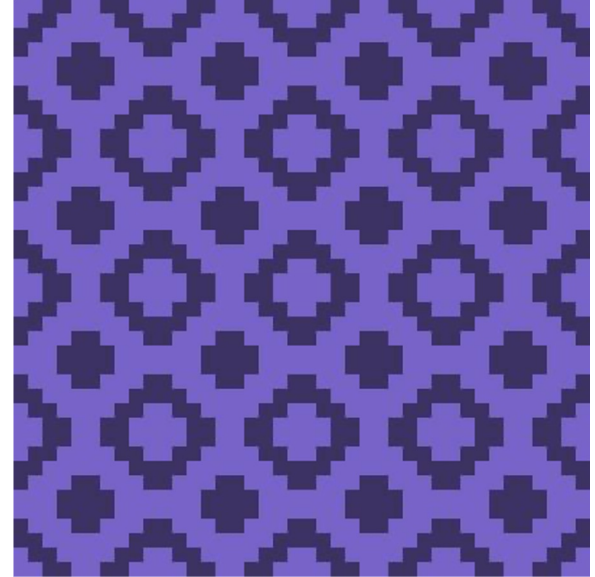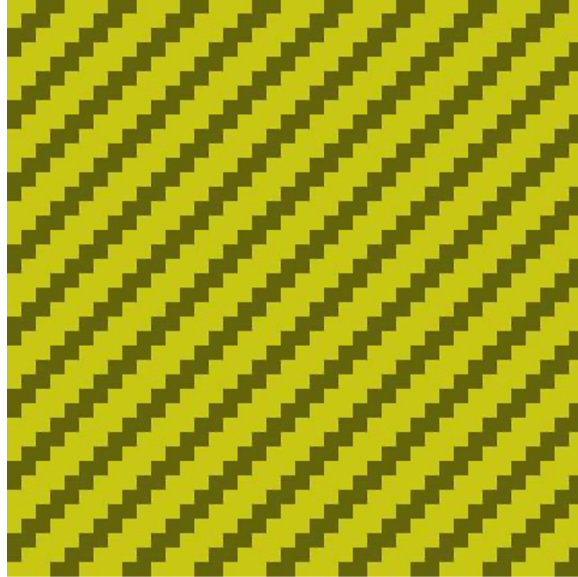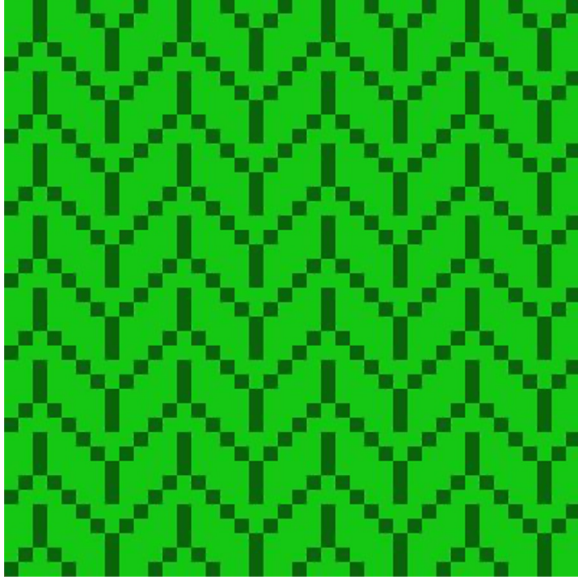
Slides from the Assigned Videos

Back to Handcraft

Where are we?

Program Design

A handcraft is a collection of _____. Every _____ has a _____, and a collection of _____. Every _____ is a collection of _____. Every _____ is either "knit" or "purl," and is drawn as a _____.

Classes in Python

Mechanism for creating user-defined types.

Used to identify attributes with an object.

Associates functionality with the relevant objects.

Ex:

```python
8    @dataclass
9    class color:
10       """
11       color: simply gathers color components
12       """
13       red: int = 120
14       green: int = 120
15       blue: int = 120
```
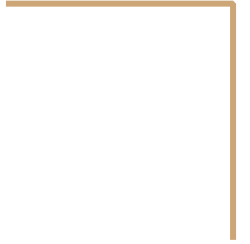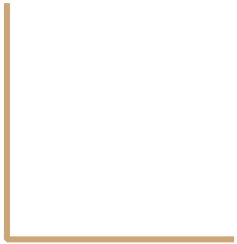
Design Strategies

1. Decompose a problem into classes
2. List the data associated with each class
3. Write the "driver" code that illustrates the functionality you expect from each class.
4. Implement the functions you expect.
5. Run the driver code to test your functionality.

Reminder: Pick Colours

http://colorizer.org

Questions!

Before Next Class:
Make sure you can run Python locally!