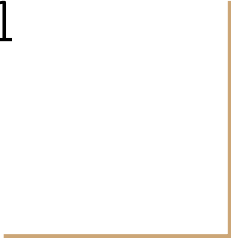# Programming, Problem Solving, and Algorithms

CPSC203, 2019 W1

# Announcements

Lab this week: git (source code control) and PIL (Python Imaging Library)

"Problem of the Day" continues today!

# Today:

Designing and Implementing object functionality via member functions

POTD

# 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.

# Adding Functionality

Creating blocks is an arduous task. We'd like a way to make new blocks out of old ones! How many different kinds of blocks are found in this image? How are they related to one another?
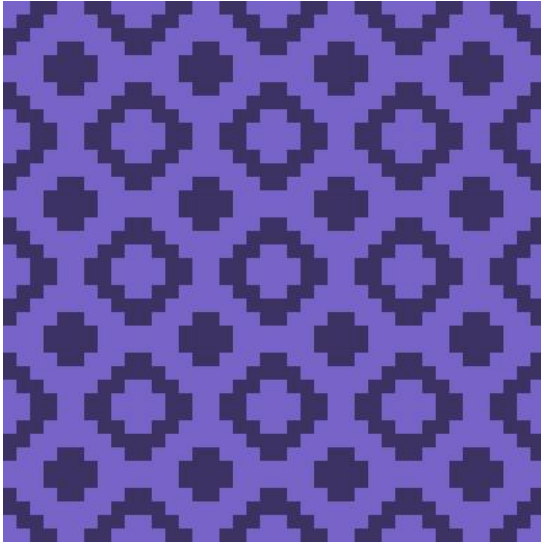
# Flip Vertical

Suppose we want to create a new block which is just the vertical reflection of a given block. Sketch the new block. Describe how you would accomplish the flipped block, in terms of the block representation in our code (list of rows).
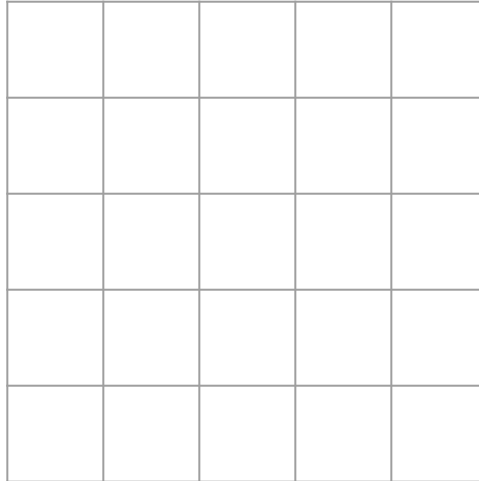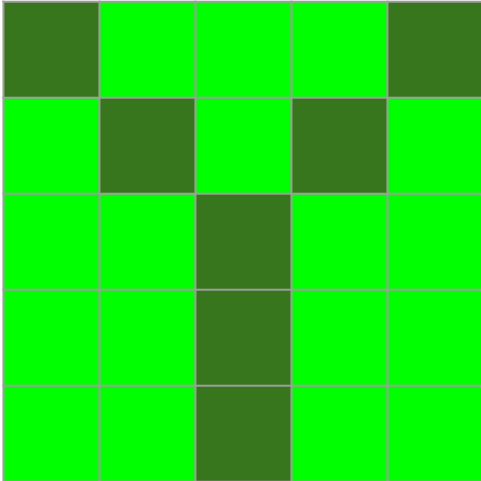


1. *New list, copy of old.*

2. *Reverse the new list.*

3. *Build block from new list.*

4. *Return new block.*

# Flip Vertical

https://repl.it/@ckh205/knittingSkeleton

Review the code we've written and make 3 observations:

1. Line ___: _____
2. Line ___: _____
3. Line ___: _____

# Flip Horizontal

Suppose we want to create a new block which is just the horizontal reflection of a given block. Sketch the new block. Describe how you would accomplish the flipped block, in terms of the block representation in our code.
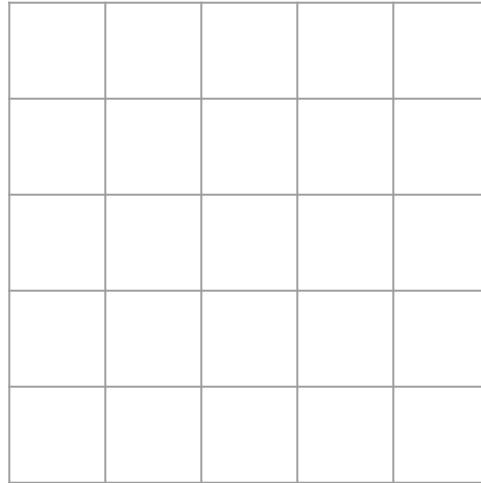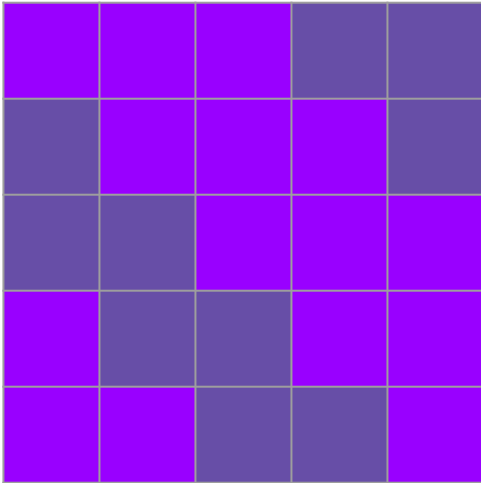
1.

2.

3.

Need 2 new things...

# List Comprehensions in Python

A new way to create lists from old!

https://repl.it/@ckh205/ListComprehensionsExamples

General Form:

[ <u>element</u>  `for` <u>iterator</u> `in` <u>baselist</u> `if` <u>condition</u> ]
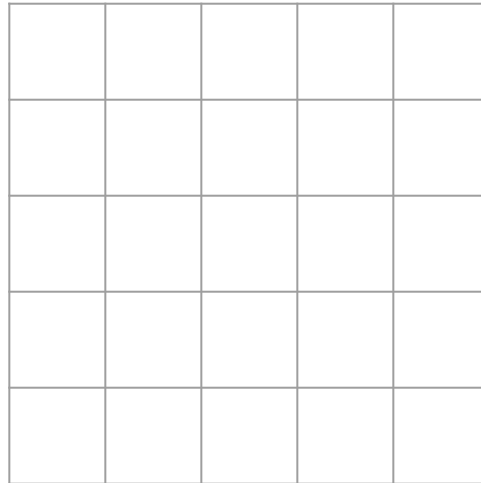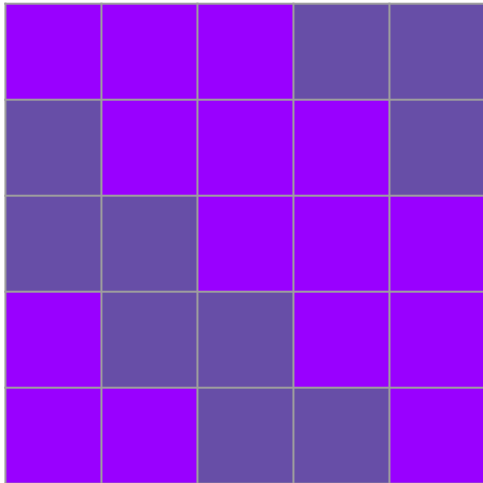
# Flip Horizontal

Review the code we've written and make 3 observations:

1. Line ___: _____
2. Line ___: _____
3. Line ___: _____

# Rotate 180

Suppose we want to create a new block which is a 180 degree rotation of a given block. Sketch the new block. Describe how you would accomplish the flipped block.

1.

2.

3.

4.

# Rotate 180

https://repl.it/@ckh205/knittingSkeleton

Review the code we've written and make 3 observations:

1. Line ___: _____
2. Line ___: _____
3. Line ___: _____

# POTD #3 Tue

https://cheeren.github.io/cpsc203test/

Describe any snags you run into:

1. Line ___: _____
2. Line ___: _____
3. Line ___: _____
4. Line ___: _____
5. Line ___: _____

# ToDo for next class...

POTD:  Continue Fri and Mon. Submit to repo.

Reading: TLACS Ch 4 (intro to turtle graphics and iteration)

Play: https://www.google.com/search?q=color+picker

Adapt: Use today's demo to create a handcraft of your own! Upload your creation to https://bit.ly/2ly0z8Q (please make unique file names)

References:

TLACS Ch 17

https://docs.python.org/3/library/dataclasses.html