

Review

- What are the two ways to import a module into a program?
 - How does using the imported functions change with each type of import statement?
- How can we tell a Python program to repeat something a set number of times?

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Review: `import` statement

- Two ways to use `import` statement:
 1. `import <modulename>`
 - Then, need to prepend modulename to each constant or function
 - Ex: `math.ceil`, `math.pi`
 2. `from <modulename> import <defn>`
 - Can then just use function or constant
 - Ex: `ceil`, `pi`

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Review: `for` loop

```
for i in range(5):  
    # like assigning i values(0,1,2,3,4)  
    # loop body ...
```

- When have `range(5)`, `i` gets values (0, 1, 2, 3, 4), for each time through the loop
 - Which means that loop executes 5 times
- Loop variable name doesn't matter

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Review: OO Programming

- How do we create an object?
- How do we give commands to/do operations on objects?
- How do we know what methods are available to us for an object of a certain type?
- What is the syntax for calling a method on an object?

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OO Terminology Summary

Term	Definition	Examples
Class	A data type. Defines the data and operations for members of the class	<code>str</code> , <code>TV</code> , <code>GraphWin</code>
Object	An <i>instance</i> of a specific class	<code>animal</code> , <code>myTV</code> , <code>window</code>
Method	Operations you can call on an object	<code>setBackground(<color>)</code> , <code>getWidth()</code>
Constructor	Special method to create an object of a certain type/class	<code>GraphWin()</code> , <code>str(1234)</code>

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Development Techniques

1. Know everything you need up front
 - Set up what you need
 - Use as you go
2. Figure out you're missing things
 - Create variable for what you need, then create what you need

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Problem: Draw a Full-Canvas Tic-Tac-Toe Board

- Using the Graphics API
- Make lines purple and line width 3
 - Keep it general, regardless of GraphWin width, height

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Modification to Tic-Tac-Toe

- **clone** a vertical line and horizontal line and shift appropriately
- Why clone?
 - Maintain the same properties (color, line-width, length)
 - Simplifies code

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OO Hints

- Use API to do work for you
 - Call appropriate methods for the type/class of object
- Always need to create/construct an object before using it
- Keep in mind the type of the object that you're dealing with

Object Name	Type
rect	Rectangle
win	GraphWin
upper_left_pt	Point

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Lab 1 Feedback

- Good test cases
 - Ex: Use well-known values for F→C conversion
 - Using 0s
- Good variable naming
- Good high-level descriptions
 - I use to make sure you understand the purpose of the program

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Lab 1 Feedback: Common Mistakes

- Not executing program **more than one** time if have input from user
 - Test with negative values and floats, as appropriate
- Unlabeled output
 - Tell user what is being output

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Lab 2 Overview

- Practice Python programming
 - Mod
 - for loops
 - Using Functions, Modules
 - OO with graphics library

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