



The Point of This Course

CS 5010 Program Design Paradigms
“Bootcamp”
Lesson 0.1



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Learning Objectives

- By the time you complete this lesson, you should be able to :
 - Explain **the point** of the course
 - list the 6 principles for writing beautiful programs
 - list the 6 steps of the design recipe
 - recite some of the slogans that we will use throughout the course.

The Point

1. It's not calculus. Getting the right answer is **NOT ENOUGH**.
2. The goal is to write **BEAUTIFUL PROGRAMS**.
3. A beautiful program is one that is readable, understandable, and modifiable by people.

Your programs should look like this:



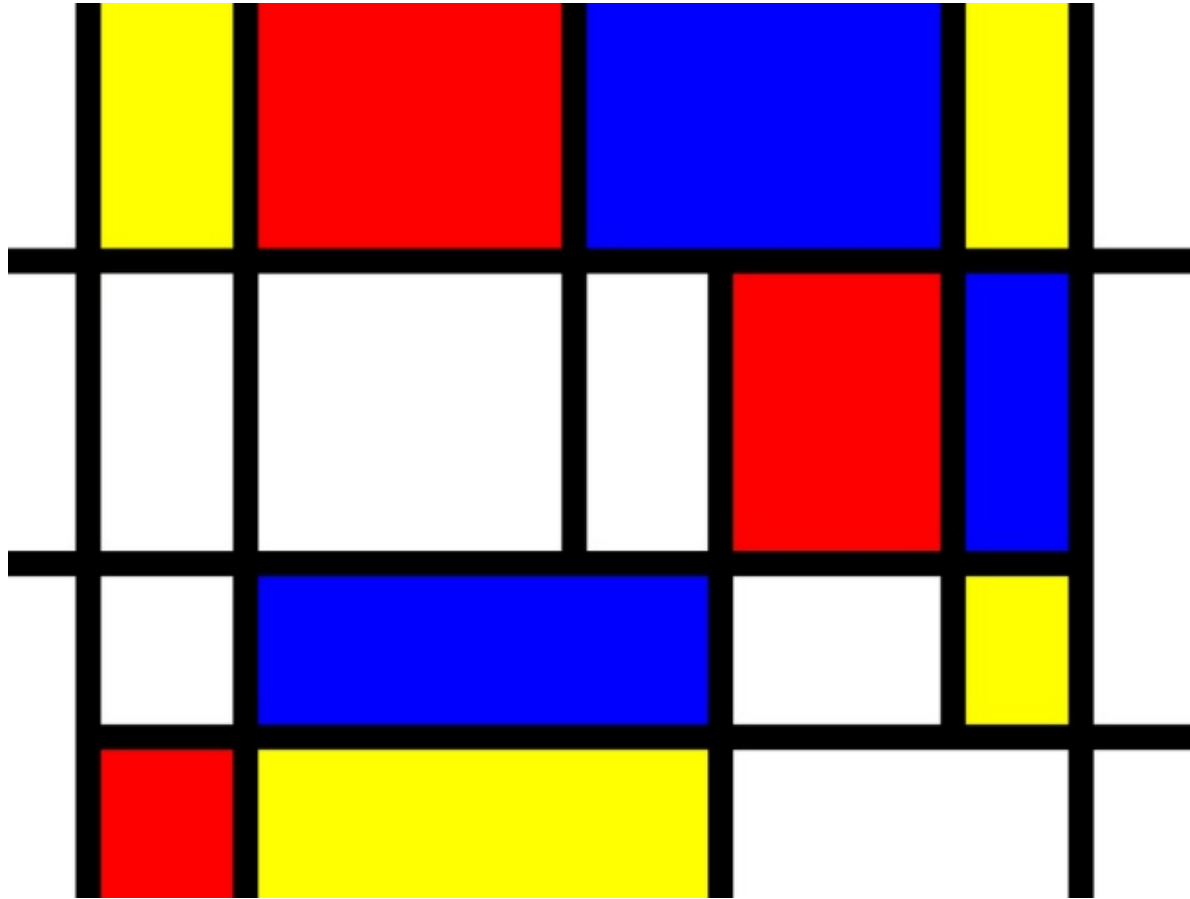
[source](#)

Not like this



[source](#)

Your programs should look like this



[source](#)

Not like this



[source](#)

And never, ever like this



[source](#)

Principles for writing beautiful programs

1. Always remember: Programming is a People Discipline
2. Represent Information as Data; Interpret Data as Information
3. Programs should consist of functions and methods that consume and produce values
4. Design Functions Systematically
5. Design Systems Iteratively
6. Pass values when you can, share state only when you must.

Principles

- Everything we do can be traced back to one or more of these principles.
- We will expand on each of them as we go along.
- Write these down, in your own handwriting. Writing things down will help you remember them.

A Few of Our Slogans

- We are also big on slogans. We think they help focus your mind.
- Here are our first few slogans. You should write them down, too, in your own handwriting.
- In fact, whenever you see one of these blue tables, you should assume that this is something important, and you should probably write it down in your own handwriting so you can memorize it.

Some Slogans

1. Stick to the recipe!
2. You don't understand it until you can give an example.
3. One function, one task.
4. The Shape of the Data Determines the Shape of the Program.
5. Practice makes perfect.

The Function Design Recipe

- The function design recipe is the most important thing in this course. It is the basis for everything we do.
- It will give you a framework for attacking any programming problem, in any language. Indeed, students have reported that they have found it useful in other courses, and even in their everyday life.
- With the recipe, you need never stare at an empty sheet of paper again.
- Here it is:



The Function Design Recipe

The Function Design Recipe

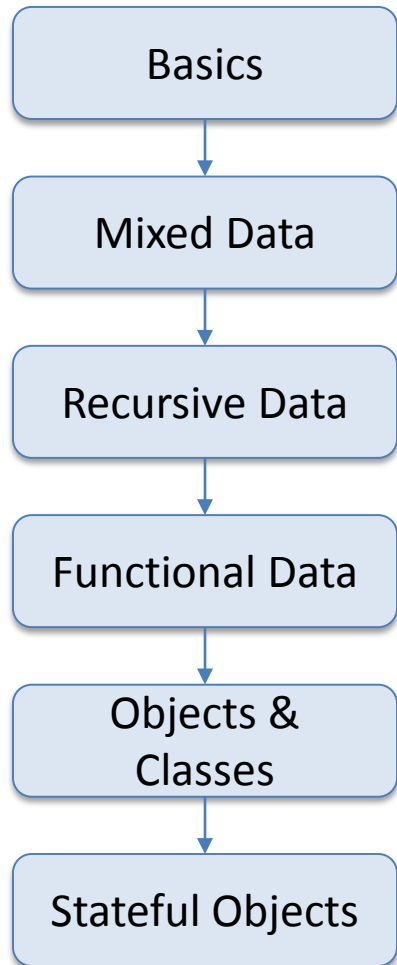
1. Data Design
2. Contract and Purpose Statement
3. Examples and Tests
4. Design Strategy
5. Function Definition
6. Program Review

This is important. Write it down, in your own handwriting. Keep it with you at all times. Put it on your mirror. Put it under your pillow. I'm not kidding!

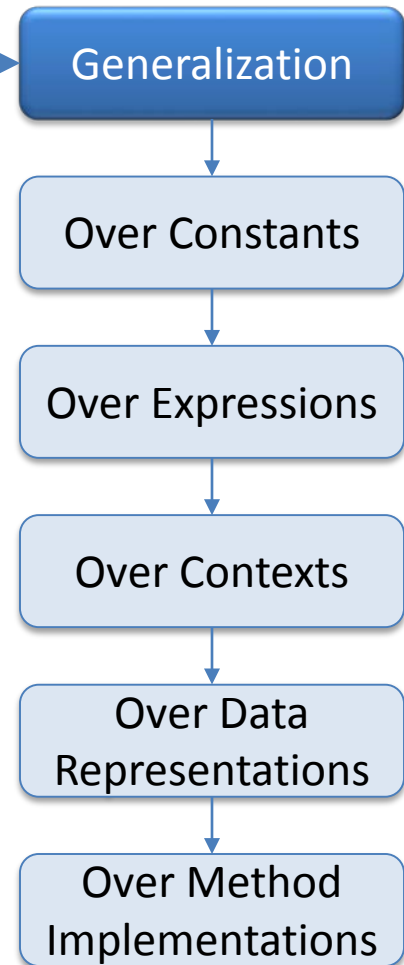
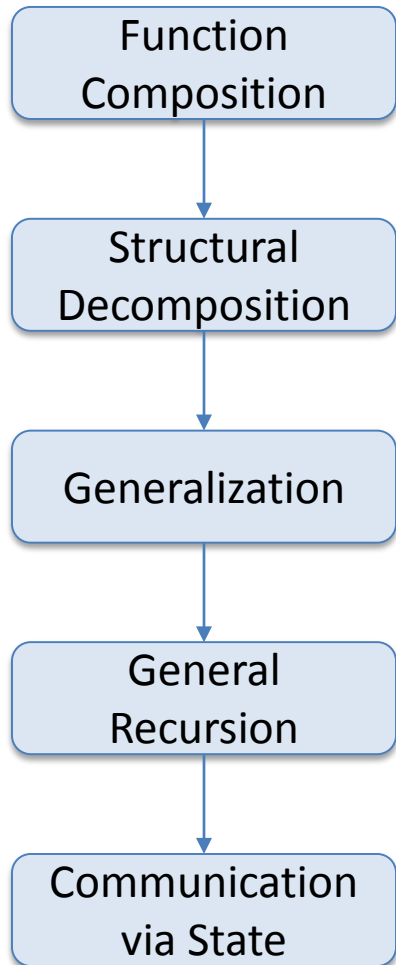


Course Map

Data Representations



Design Strategies



Next Steps

- If you have questions about this lesson, ask them on Piazza
- Go on to the next lesson