CSCI 136: Data Structures and Advanced Programming
Lecture 3
Program Design
Instructor: Dan Barowy Williams

Topics
- Quiz Answers
- Classes
- Program design
- Nim
- Maybe: classes vs objects

Your to-dos
1. Reminder: lab meeting today/tomorrow, in person! WOOHOO!!!
2. Lab 1, due Tuesday 9/20 by 10pm.
3. Read before Fri: Bailey, Ch 1.5-1.10.
4. Study for quiz on Friday/Saturday

Announcements
- CoSSAC Nominations by Thursday by 5pm. Feel free to self-nominate!
  https://sites.google.com/williams.edu/cossac
- CS Colloquium this Friday, Sept 16 @ 2:35pm in Wege Auditorium (TCL 123)
  Ina Fiterau Brostean (UMass Amherst)
  Machine Learning for Healthcare

  Fiterau’s research lies at the intersection of machine learning and healthcare. Her Information Fusion Lab is currently working on a project combining features extracted from brain MRIs with patient demographics, test results, and contextual information, to detect Alzheimer’s disease earlier than traditional diagnostics can.
Quiz Solutions

How many hours per week should you budget for work beyond the time you spend in lecture and our scheduled lab?
At least 10 hours.  (98% got this)

What is the deadline for assigned labs in this course?
Tuesday at 10pm  (100% got this)

Is late work accepted in this class?  (100% got this)
Only with prior arrangement, otherwise -20% per day.

What is the outcome for not attending your assigned lab?
Course failure.  (98% got this)

How many assignments may you resubmit?
Two assignments.  (100% got this)

Quiz Solutions

How many licks does it take to get to the Tootsie Roll center of a Tootsie Pop?
Three.  (13% got this!!!)

Classes

A class is a mechanism for data abstraction. The purpose of a class is to separate the details that are important to the programmer (the interface) from the details that are important to the computer (the implementation). Classes are a key building block in designing data structures.
Nim

- Game starts with random piles.
- Each player removes one or more objects from ONE pile.
- The last player to remove the last object loses.
Design doc

Four basic questions you should answer:

- **Overview**
  - Q: What is the program trying to do at a high level?
  - Should be written exclusively in English.
- **State**
  - Q: What data needs to be stored?
  - OK to use a little code here, but be sure to explain.
- **Functions**
  - Q: What operations does the program perform?
  - Start by refining in English.
  - Eventually, refine into method signatures.
- **Procedure**
  - Q: What steps does the program carry out, and in what order?
  - Stay high level, and keep it in English, but refer things you described in your State and Functions sections.

Important: we are not writing code; we’re just thinking.

Activity: Nim design doc

TwoPlayerGame interface

Let’s build this together
Recap & Next Class

Today:

• Classes
• Program design
• Nim

Next class:

• Classes vs objects
• Scanner