CSCI 136: Data Structures and Advanced Programming
Lecture 4
Exceptions and classes

Instructor: Dan Barowy Williams

Topics

- Study tip: growth mindset
- Exceptions
- Classes and objects

Study tip #1: growth mindset

Have you ever thought: “I’m not good at [x]”

If you are motivated and study effectively, there is nothing you cannot learn.

In fact, you learn whether you want to or not.

Proof (demo). Again. Ungarbled. One more time.

Notice that you can understand the garbled sound!
Study tip #1: growth mindset

Every brain is an amazing learning machine.

Your brain is capable of rewiring itself in milliseconds.

Learning how to use your brain is a skill that requires practice!

Your to-dos

1. Lab 1, due Tuesday 9/20 by 10pm.
2. Quiz on Fri/Sat.
   Material: nuts and bolts discussed in class this week (command line arguments, Scanner, classes/objects)
3. Read before Mon: Bailey, Ch 3-3.1 & Ch 4-4.2.2. Suggestion: read actively.

Announcements

• CS Colloquium today @ 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.
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.

One way of thinking about a class

How I organize a **class**

```java
class Foo {
    /* INSTANCE VARIABLES */
    int bar; // number of foos
    String baz; // foo name

    /* CONSTRUCTOR */
    public Foo() { … }

    /* INSTANCE METHODS */
    public int getBar() { … }
    public void setBar(int b) { … }

    /* STATIC METHODS */
    public static void main(…) {…}
}
```

Initializing board randomly
A software exception is a mechanism for signaling errors. When an exception is thrown in a program, the program will cease running ("crash") unless the program catches and handles the error.

We will talk more about how this mechanism works when we discuss the call stack in the near future.
Classes and objects

Classes are prototypes.
Objects are copies (“instances”).

“Car” is a prototype.
There are many instances of cars.
All cars have the same interface.
(wheels, doors, steering wheel, etc.)

But most cars vary in the details
(wheels, doors, steering wheel, etc.)
Methods are functions that are tied to either:
1. a class, or
2. an instance of a class (an object).

static methods are “attached” to class.
instance methods are “attached” to object.

 Recap & Next Class

Today:
• Scanner
• Exceptions

Next class:
• Abstraction
• Vectors and generics