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!

Anil Seth, Professor of Cognitive and Computational Neuroscience, University of Sussex

Your to-dos

1. Lab 1, due Tuesday 2/15 by 10pm.
2. Read before Mon: Bailey, Ch 3-3.1 & Ch 4-4.2.2.
   Suggestion: read actively.

Announcements

• Colloquium today @ 2:35pm in Wege (TCL 123): Senior Thesis Proposals
Nim

• Game starts with random piles.
• Each player removes one or more objects from ONE pile.
• The last player to remove the last object wins.

Exceptions

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.

More precisely, an uncaught exception unwinds the call stack until a matching exception handler is found. If an exception handler is not found, the program halts, printing a stack trace.

Example in Nim using Scanner
Java is Object-Oriented

- OO is a system for writing code that has properties highly valued by software engineers.
- Those properties are:
  - Code reuse
  - Modularity
  - Data abstraction
- It is sometimes said (incorrectly) that OO is about “modeling the real world.”
- OO is a very big topic, and it takes awhile to master all the pieces.
- For now, we are going to focus on data abstraction.

If you don’t understand all these words just yet, don’t worry.

Classes and objects

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

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.
“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.)

public static void main(String[] args) {
    System.out.println(“I’m static!”);
}

Methods are functions that are tied
to either:
1. a class, or
2. an instance of a class (an object).

static method
instance method
**static** methods are “attached” to class.
Instance methods are “attached” to object.

```plaintext
area()  
numSides()  
```

A class also defines a **type**.
Using object incorrectly yields a **type error**.

Let’s convert Nim to use objects.
Recap & Next Class

Today:

- Scanner
- Exceptions
- OO

Next class:

- Vectors and generics