"We found that students' mindsets—how they perceive their abilities—played a key role in their motivation and achievement, and we found that if we changed students' mindsets, we could boost their achievement. More precisely, students who believed their intelligence could be developed (a growth mindset) outperformed those who believed their intelligence was fixed (a fixed mindset). And when students learned through a structured program that they could "grow their brains" and increase their intellectual abilities, they did better. Finally, we found that having children focus on the process that leads to learning (like hard work or trying new strategies) could foster a growth mindset and its benefits."

-- Carol Dweck, author of Mindset: The New Psychology of Success

https://www.edweek.org/leadership/opinion-carol-dweck-revisits-the-growth-mindset/2015/09

CSCI 136:
Data Structures
and
Advanced Programming

Lecture 2

Java Basics

Instructor: Kelly Shaw

Williams

Topics

Java basics

Static data types

Object orientation

Your to-dos

1. Lab 0, **due Tuesday 9/13**.
2. Read **before Wed**: Bailey, Ch 1-1.4 (inclusive).

Announcements

- Anonymous feedback form on website
- 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.
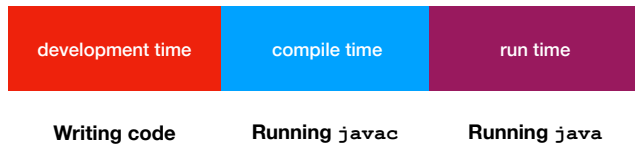

Static data types

Java types

```
byte
short
int
long
float
double
boolean
char
```
and user-defined `class`es

(you should **memorize** this list)

The life of a program

development time	compile time	run time
Writing code	**Running** `javac`	**Running** `java`

Definition slide

A **definition slide** defines an important term that you should remember. You are **strongly advised** to write down and study these key terms.

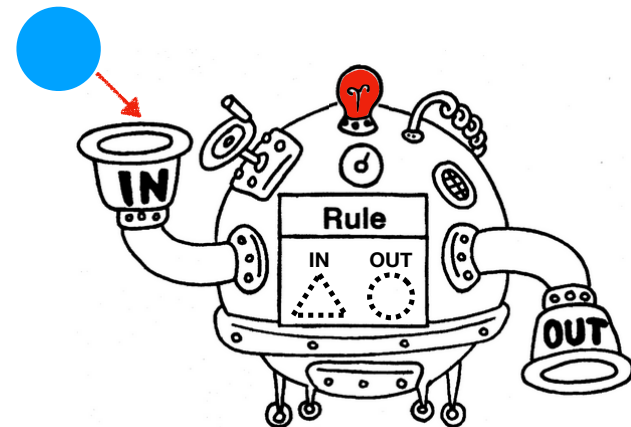(definition slides **look the same** to make them easy to spot!)

Static data types

A **data type** is a label, assigned to a variable, that ensures that **only valid operations** are allowed using that data.

A **static data type** is a type that is checked **before a program runs**. Static data types are usually checked at **compile time**. A program that fails a static type checks is not compiled.

(**always** be sure to submit lab code that compiles!)

Using data incorrectly yields a type error.

Let's grow a few programs…

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**.

Recap & Next Class

Today:

- Java basics
- Static data types
- Object orientation

Next class:

- Classes and objects
- Designing programs with classes
- Fancy input using `Scanner`