LEC 10

CSE 122

Introduction to Objects

Questions during Class?

Raise hand or send here

sli.do #cse122

BEFORE WE START

Slido vote & chat with neighbors:

What are your favorite places to study on/near campus?

Music: 122 26sp Lecture Jams

Instructor: Elba Garza

TAs:

David	Caleb	Cole	Yang
William	Neha	Blake R.	Cady
Dani	Wesley	Carson	Diya
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Shreyank	Hanna	Nicolae	
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Lecture Outline (1/3)

- Announcements
- OOP
- Example

Announcements

- Programming Assignment 2 (P2)
  - Due Tuesday, May 12th by 11:59pm PT
  - Note: This is an extended deadline
- Quiz 1 tomorrow, May 7th in your registered quiz section!

Lecture Outline (2/3)

- Announcements
- **OOP**
- Example

Object Oriented Programming (OOP)

- **Procedural programming**: Programs that perform their behavior as a series of steps to be carried out
  - Classes that do things

- **Object-oriented programming (OOP):** Programs that perform their behavior as interactions between objects
  - Classes that represent things
  - We're going to start writing our own objects!

Classes & Objects

- **Classes** can define the template for an object
  -  Like the blueprint for a house!

    "What does it mean to be this thing?"

- **Objects** are the actual instances of the class
  -  Like the actual house built from the blueprint!

    "It is an example of this thing!"

We create a new instance of a class with the `new` keyword

e.g., `Scanner console = new Scanner(System.in);`

Object State & Behavior

- **Objects** can tie related *state* and *behavior* together

- **State** is defined by the object's *fields* or *instance variables*
  - *Scanner's state may include what it's scanning, where it is in the input, etc.*

- **Behavior** is defined by the object's *instance methods*
  - *Scanner's behavior includes "getting the next token and returning it as an `int`", "returning whether there is a next token or not", etc.*
  - ***...Next time!***

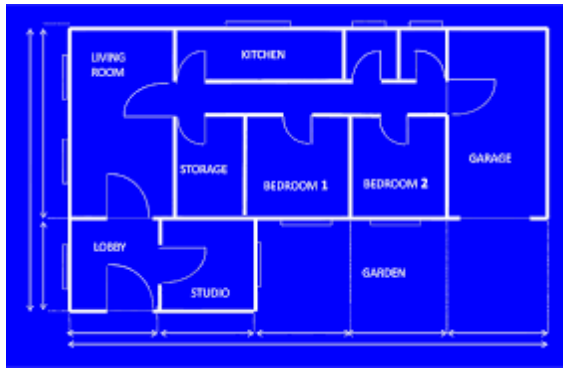
Object Class Syntax

```
public class MyObject {
    // fields (or instance variables)
    type1 fieldName1;
    type2 fieldName2;
    ...

    // constructor
    public MyObject() {
        ...
    }

    // instance methods
    public returnType methodName(...) {
        ...
    }
}
```

Instance Variables

- Fields are also referred to as **instance variables**

- Fields are defined in a class, where each instance of the class has their own copy of the fields
  - Hence *instance* variable! It's a variable tied to a **specific** instance of the class!



Instance Methods

- **Instance methods** are defined in a class
- Calling an instance method on a particular *instance* of the class will have effects only on that instance

Lecture Outline (3/3)

- Announcements
- OOP
- **Example** 

Representing a Shopping Cart (1/2)

How would we do this given what we knew last week?

Maybe `int capacity,` ~~`List<String>`~~ `items?`

Maybe `Set<String>?`

Representing a Shopping Cart (2/2)

How eek?

May ?

Let's make a class instead!

Maybe `Set<String>`?

Constructors

- **Constructors** create (or construct) a new instance of a class

- Java provides a default constructor “for free” that sets all fields to a default value

We’ll talk more about constructors next time too!