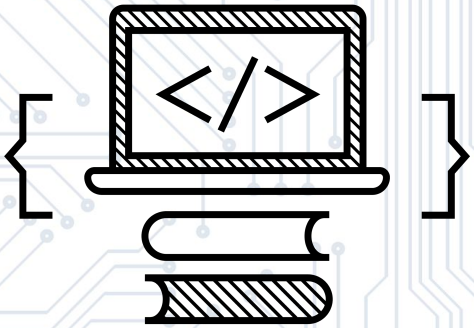
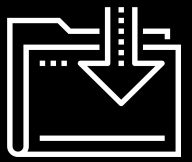


# Object-Oriented Programming (OOP)

Web Development Boot Camp

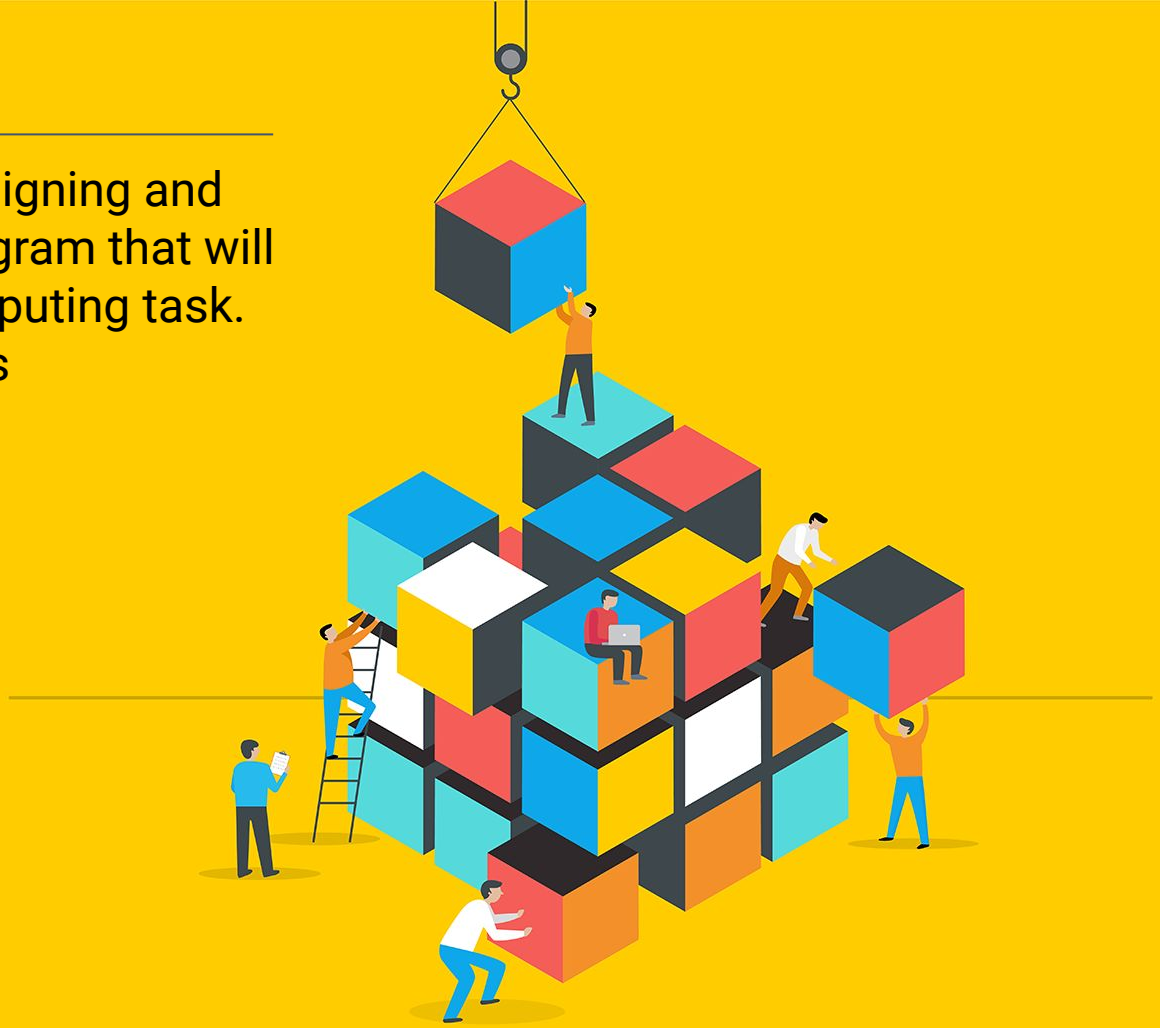
Unit 10



# What is programming?

# Programming

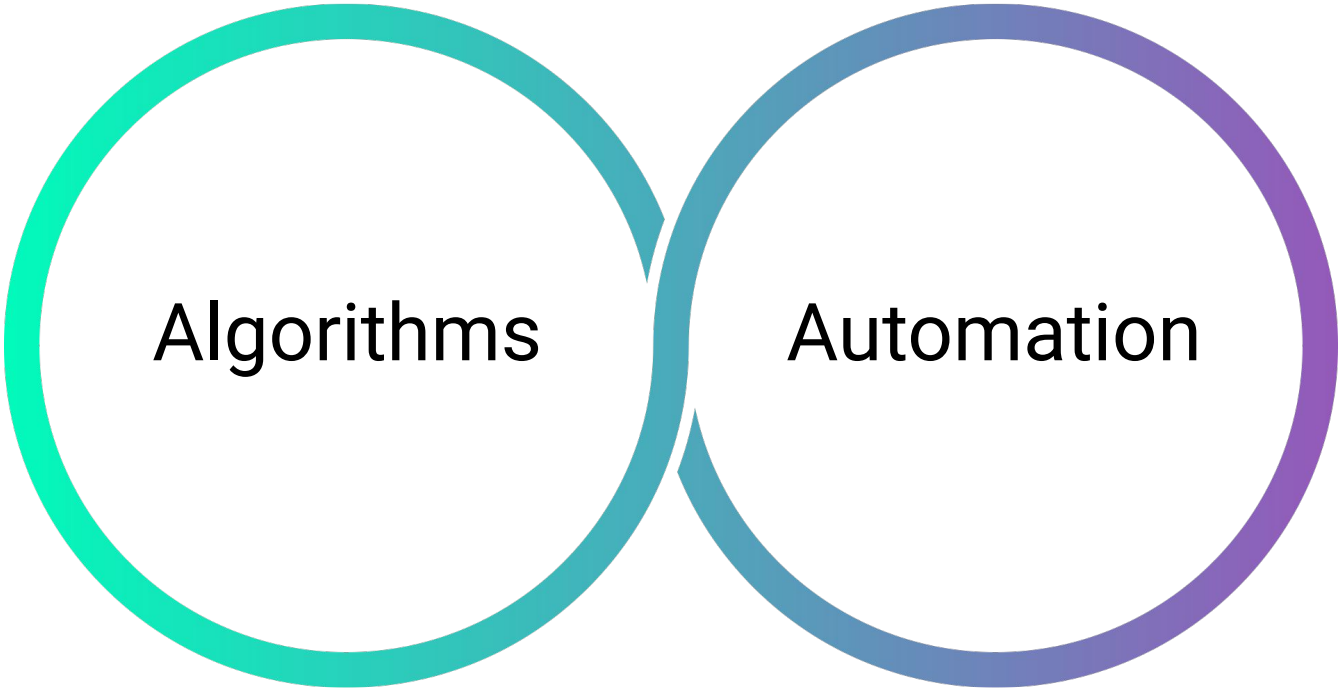
**Programming** refers to designing and building an executable program that will accomplish a specific computing task. Essentially, programming is problem-solving.



# What problems do we solve?

# Algorithms and Automation

Programming enables us to solve almost any task or problem on a computer, usually in one of two primary categories: algorithms or automation.



# What is DRY?

# Don’t Repeat Yourself (DRY)

**DRY**, or **Don’t Repeat Yourself**, is a fundamental programming principle. Duplicate code wastes time and memory and can confuse readers or contributors to your project.

# What is an object?

# Objects

**Objects** in JavaScript are unordered collections of related data built on a key-value structure in which values can be any data type, including functions.

```
const person = {
 name: ['Bob', 'Smith'],
 age: 32,
 gender: 'male',
 interests: ['music', 'skiing'],
 bio() {
   alert(
     `${this.name[0]} ${this.name[1]} is ${this.age} years old.
    He likes ${this.interests[0]} and ${this.interests[1]}.`
   );
 }
```

# Why are objects important in JavaScript?

# Because Everything in JavaScript Is an Object!

Well, except for primitive data types. Everything else is an object—essentially a list of key-value pairs.

**Data types that are objects:**

- Arrays
- Dates
- Math
- Functions
- And more!

**Primitive data types (NOT objects):**

- Null
- Undefined
- Strings
- Numbers
- Symbols
- Booleans

# How do we create objects?

# Creating Objects

We can use **object literals**, which define and create an object in one statement.

```
const car = { name: 'honda', model: 'civic', year: 2008, color: 'black' };
```

We can use the `new` keyword, which defines and creates a single object.

```
const Honda = new Car()
```

Or we can use **constructors**, which create objects from a blueprint.

```
class Car {
 constructor(name, model, year, color) {
   this.name = name;
   this.model = model;
   this.year = year;
   this.color = color;
 }
}
```

# What is object-oriented programming?

# Object-Oriented Programming (OOP)

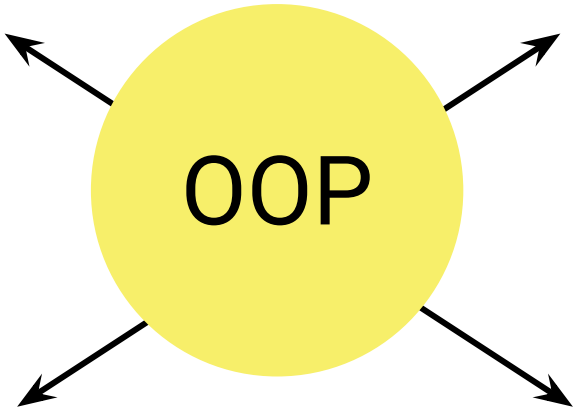
OOP is a programming paradigm, or pattern, centered around objects. In object-oriented programming, we solve problems by employing collections of objects that work together. Their ability to communicate with each other makes objects particularly well-suited to address large, complex problems. OOP offers the following benefits:

**Encapsulation**

Object data (and often functions) can be neatly stored (i.e., encapsulated).

**Inheritance**

New classes can be created based on other classes (i.e., the `Person` class is parent to the `Student` and `Teacher` classes).




**Abstraction**

Creating a simple model of something complex.

**Polymorphism**

Multiple object types can implement the same functionality.

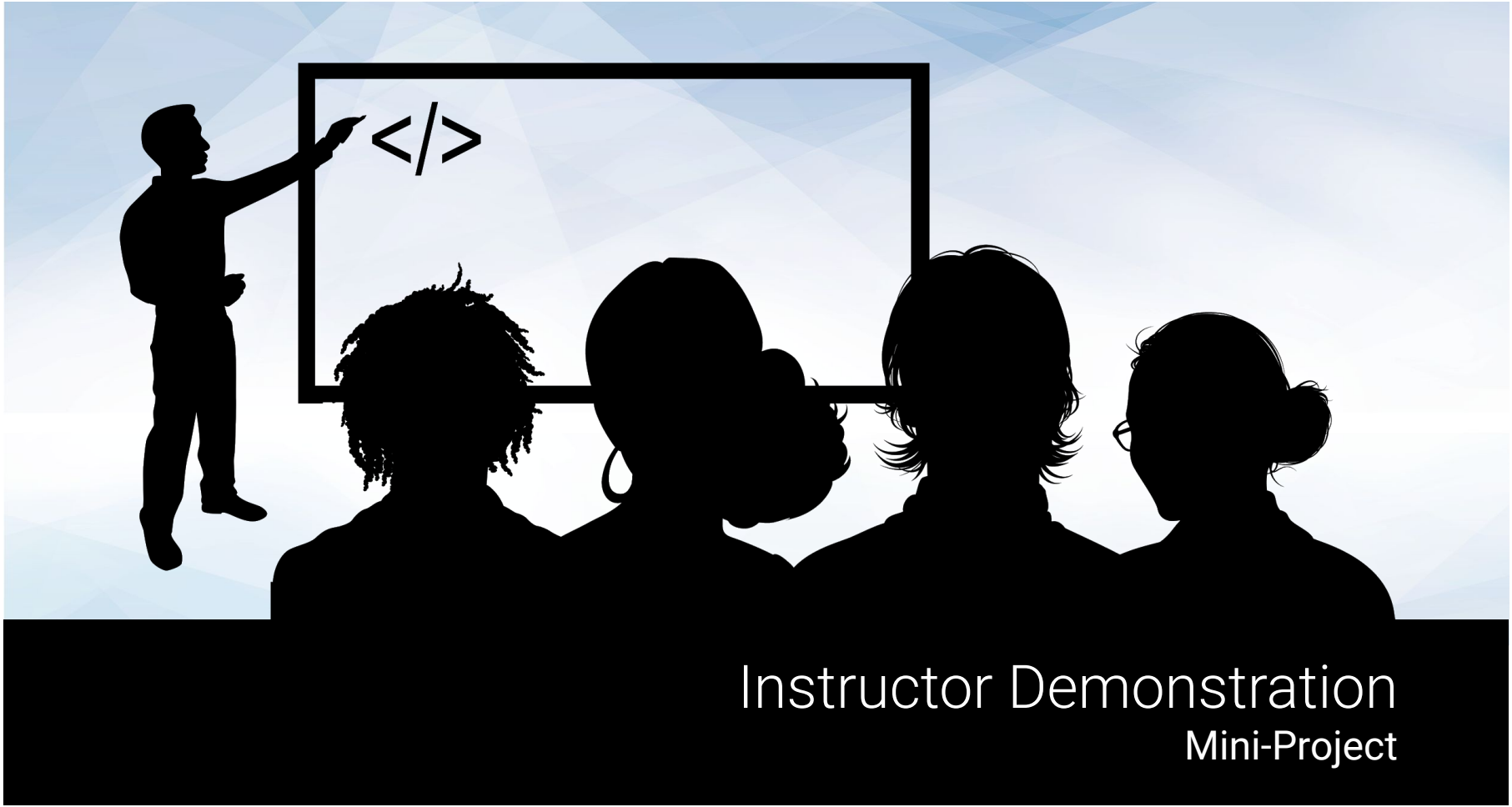
# How can we learn to use OOP?

# How to Learn OOP

OOP is a broad concept that is best learned through real-life examples. We begin to see the value of OOP when we use objects to model real-world things in code and provide functionality that would otherwise be hard or impossible to achieve.

Try some of the following techniques to learn OOP:

- Read the docs and practice with the provided examples.
- Reverse-engineer finished code to see how it was created.
- Build something from scratch.
- Debug a broken app using Chrome DevTools.
- And most importantly, ask questions!




# Instructor Demonstration

## Mini-Project