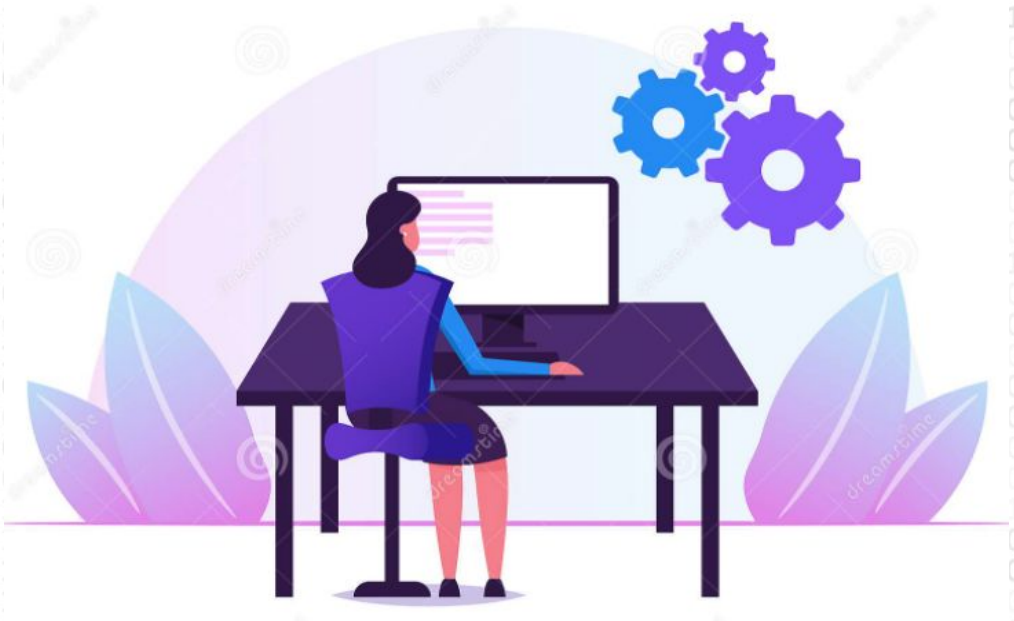
Welcome!



WWCode Digital + **Backend**

Backend Study Group

March 31, 2022

- We'll start in a moment :)
- We are NOT recording tonight's event. We may plan to take screenshots for social media.
- ***If you want to remain anonymous***, change your name & keep video off.
- We'll introduce the hosts and break in-between for Q/A.
- We will make some time for Q&A at the end of the presentation as well.
- You can come prepared with questions. And, feel free to take notes.
- Online event best practices:
- Don't multitask. Distractions reduce your ability to remember concepts.
- Mute yourself when you aren't talking.
- We want the session to be interactive.
- Feel free to unmute and ask questions in the middle of the presentation.
- Turn on your video if you feel comfortable.
- Disclaimer: Speaker doesn't knows everything!

WOMEN WHO CODE

Introduction & Agenda

- Welcome from WWCode!
- Our mission: Inspiring women to excel in technology careers.
- Our vision: A world where women are representative as technical executives, founders,VCs, board members and software engineers.

- What is Backend Engineering?
- Introduction to Java Microservices:
- What is Java?
- What is Spring and Spring Boot?
- What are Microservices?
- Demo of a Java Microservice with CRUD operations
- Q/A.

Prachi Shah
Speaker,
Senior Software Engineer,
Metromile
Director, WWCode SF

Harini Rajendran
Co-host,
Software Engineer,
Confluent
Lead, WWCode SF

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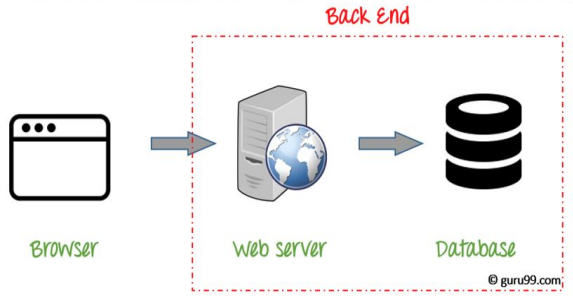
Backend Engineering

- Design, build and maintain server-side web applications.



- Common terms: Client-server architecture, networking, API, web frameworks, platform, micro-service, database engineering, web fundamentals, etc.

- Other domains: Front end engineering, full stack engineering, design & user experience, mobile development, devOps engineering, machine learning, etc. *

- Examples: Amazon Online Shopping, Instagram, Weather website.

** Disclaimer: Roles and responsibilities can vary per company and industry.*

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Backend Engineering

Java programming language:

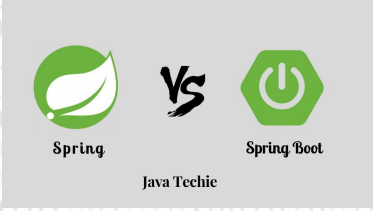
- Class-based
- Object-oriented
- WORA (write-once-run-anywhere)

Spring framework:

- Java application development framework
- Develop loosely coupled applications
- Dependency Injection & Inversion of Control: objects created by Spring container

Spring Boot framework:

- To develop microservices
- To develop REST APIs
- Build stand-alone, production-ready application
- Reduces boilerplate code because auto-configuration
- Supports in-memory database



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Backend Engineering

```
@Service   // service-layer with business logic          // Annotations are metadata
public class VehicleDetails {    // service               // Dependency Injection
    private Vehicle vehicle;    // interface               // Inversion of Control
    @Inject
    public VehicleDetails(Vehicle vehicle) {
        this.vehicle = vehicle;
    }
    public String printVehicleDetails () {
            System.out.println("The vehicle has the model: " + this.vehicle.getModel());
            System.out.println("The vehicle has the make: " + this.vehicle.getMake());
            System.out.println("The vehicle has the year: " + this.vehicle.getYear());
            System.out.println("The vehicle has the color: " + this.vehicle.getColor());
    }
}
// Calling class (client):
    VehicleTruck vehicleTruck = new VehicleTruck("GMC", "Canyon", "2016", "Silver");
    Vehicle vehicle = new Vehicle(vehicleTruck);
    vehicle.printVehicleDetails();

    VehicleCar vehicleCar = new VehicleCar("Mercedes-Benz", "A-class", "2022", "Red");
    Vehicle vehicle = new Vehicle(vehicleCar);
    vehicle.printVehicleDetails();
```


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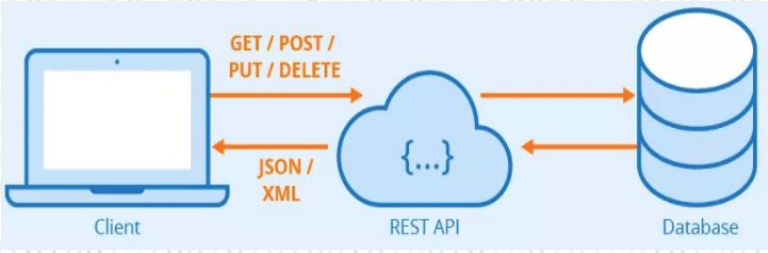
Backend Engineering



MVC design pattern:

- Model-View-Controller
- Model: Objects carrying data
- View: Visualization and data representation
- Controller: Connects with model and view. Business rules and data manipulation

REST APIs:

- REST: REpresentational State Transfer. Standard for HTTP communication
- API: Application Programming Interface. Functions for data exchange
- HTTP Verbs: POST, GET, PUT, DELETE

Microservice:

- Loosely coupled applications. Easy to scale, deploy and monitor
- Independent application that serve one purpose
- Uses REST APIs for communication
- Supports database implementation and management

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Backend Engineering

H2 Database:

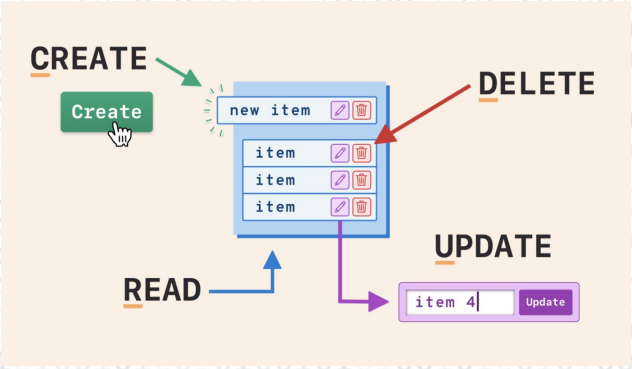
- In-memory or file-based SQL database
- Relational DBMS, standalone, open source
- Does not scale, good for development & testing
- CRUD: Create, Read, Update, Delete

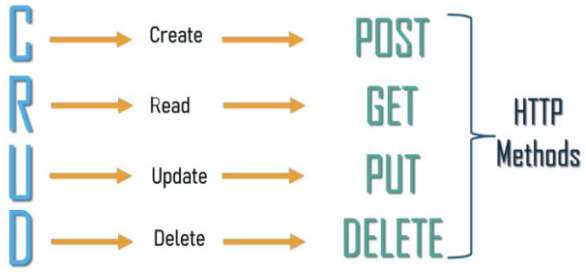
JUnit testing framework:

- TDD: Test-driven development and unit tests
- Mockito library: Mock services and repositories

Maven build automation:

- POM: Project Object Model
- Dependencies of libraries
- Set of maven commands: install, deploy





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Backend Engineering

Demo

Code, database, APIs

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Backend Engineering

Summary:
- Java is a suitable OOP & backend language to develop microservices.
- Spring and Spring Boot enable easier development for REST APIs.
- Most microservice with data has basic CRUD operations.
- Building a simple microservice with CRUD operations is easier than you think! :)

Resources:
- Creating a Simple Microservice
- What are Microservices?

Backend Study Group:
- Presentations and session recordings found here: WWCode YouTube channel
  - Upcoming session: April 14, 2022 about Intro to Kafka
  - Upcoming session: April 21, 2022 about Backend Engineer Interview preparations
  - Upcoming session: May 5, 2022 about Intro to Distributed Systems
- Technical Tracks and Digital Events
- Get updates – join the Digital mailing list!
- Have questions?
- Contacts us at: contact@womenwhocode.com
- Join our Slack channel and join *#backend-study-group*!

You can unmute and talk or use the chat.

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