

ORACLE

ORACLE  
Database 23<sup>ai</sup>



# Simplifying Data Access with Jakarta Data for Domain-Driven Design

JAVACRO'25

Juarez Barbosa Junior  [@juarezjunior](#)  
Sr Principal Java Developer Evangelist  
Oracle



 @juarezjunior



# Juarez Barbosa Junior

Senior Principal Java Developer Evangelist @ Oracle

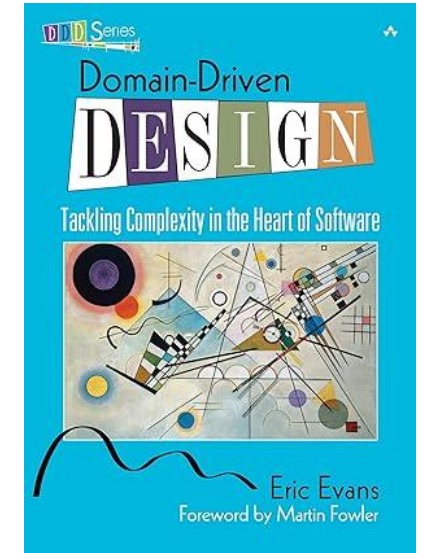
- Coming from Dublin, Ireland
- 30 years of experience in SW Engineering & DevRel
  - Oracle, Microsoft, IBM, Nokia, Unisys, Accenture, startups
  - Microsoft Azure Developer Relations Lead
  - IBM Watson Tech Evangelist & Cloud Rockstar
  - IBM Mobile Tech Evangelist & Global Thought Leader
  - Nokia Developers Global Champion
  - Java, Python, Cloud, DevOps, SRE, Cloud-native, IoT, AI, Blockchain, Rust
- Speaker at conferences
  - Oracle CloudWorld, Oracle Code, Microsoft Ignite & TechX, jPrime, JCON, DevConf.cz, GeeCon, DevOpsDays, DeveloperWeek, DevOps Institute, CloudLand, DWX, The Developer's Conference (TDC), Sec4Dev, JSNation, NodeConf, Conf42, Shift Conf, Global Azure, Open-Source Lisbon, CodeFrenzy, Mêlée Numérique, React Summit, Test.js Summit, Porto TechHub Conf, I Love Tech, Pyjamas, MiTechCon, Data Science Summit, OpenSourceNorth, WeAreDevelopers, KCDC, Devovx, INIT, Global Software Architecture Summit, Java Day Istanbul, JUGs, OUGs, GDGs, meetups, hackathons, and customer engagements.



# DDD - Domain-Driven Design

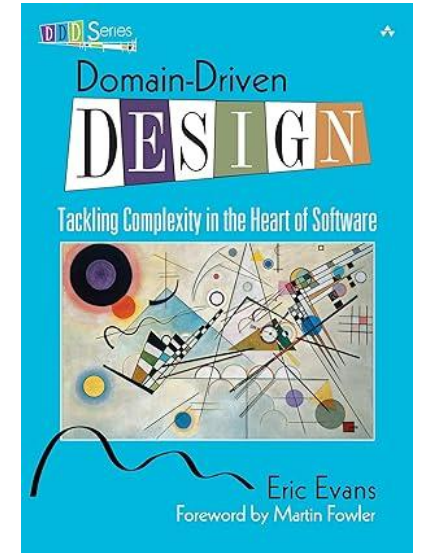


# DDD – Domain-Driven Design



- **Core tenets in a nutshell**
  - **DDD by Eric Evans: 20th August 2003 - 529 pages**
  - **Focus on the Core Domain:** Prioritize the most important part of the business (the “core domain”) where software can deliver the most value. Don’t over-engineer the supporting areas.
  - **Use a Ubiquitous Language:** Build a shared language between developers and domain experts, expressed in the code, diagrams, and conversations, to avoid misunderstandings.
  - **Model the Domain Explicitly:** Create a rich domain model (entities, value objects, aggregates, services) that reflects the real-world business processes and concepts.

# DDD – Domain-Driven Design



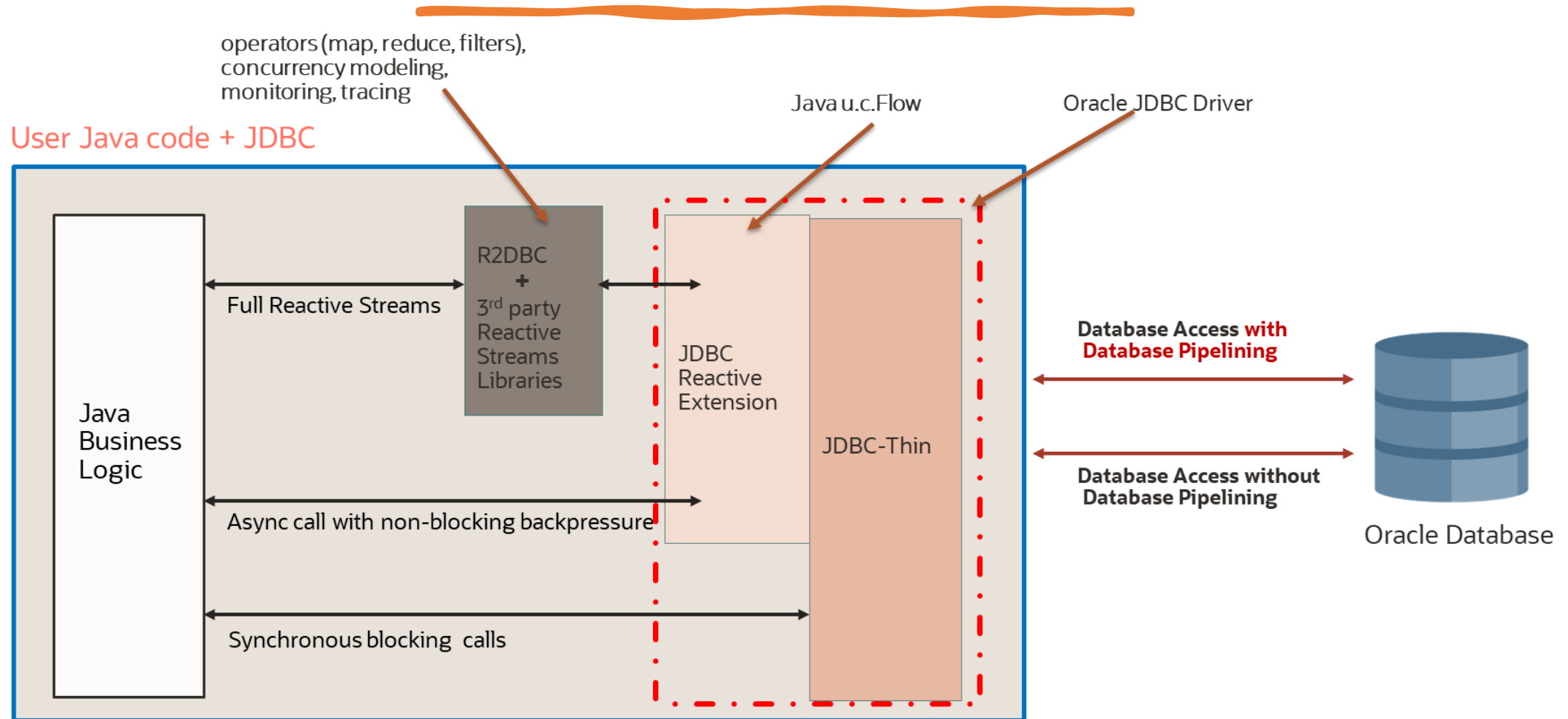
## • Core tenets in a nutshell

- **Bounded Contexts:** Divide large systems into distinct “bounded contexts” where terms, models, and rules are consistent. Make integrations between contexts explicit.
- **Continuous Collaboration:** Keep developers and domain experts working together iteratively to refine the model and evolve the system as the domain understanding improves.
- **Strategic Design:** Combine tactical patterns (entities, repositories, services) with strategic design (context maps, core vs. supporting domains) to align software architecture with business goals.

# Oracle Database 23ai



# Overview of Oracle DB Access with Java



# Oracle JDBC - Support for the Latest Java Versions



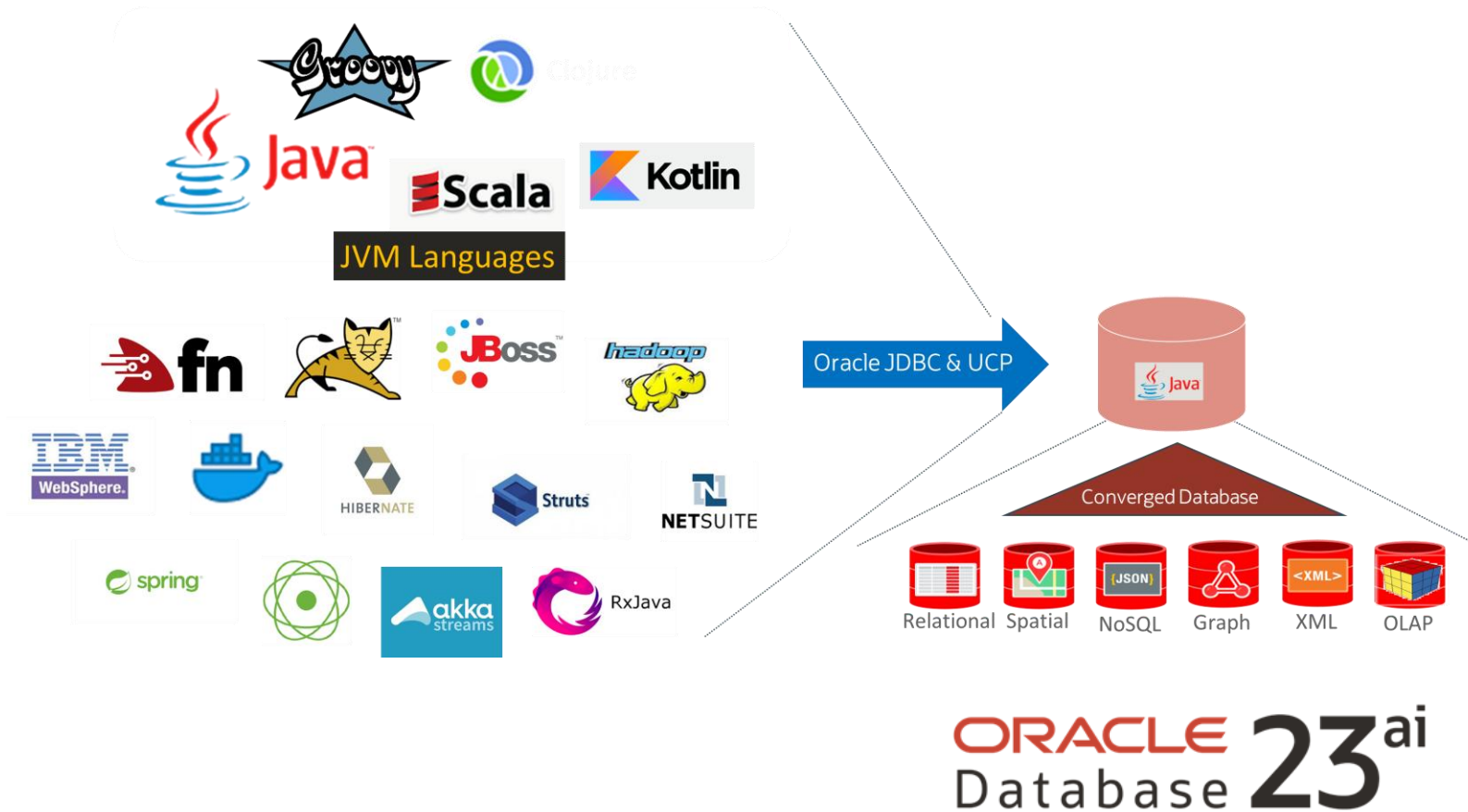
Java 25 now available

[Learn more about the latest release](#)



- Support to the latest Java versions and GraalVM
- Project Loom - Virtual Threads support
- Pipelined Database Operations
- JDBC Standards - 4.2 and 4.3
- Reactive Streams - Java Flow API support
- R2DBC, Reactive Streams Ingestion (RSI)
- Pipelined Database Operations

**Data access is critical in mission-critical applications!**



# Java App Dev with Oracle Database

# Oracle Database 23ai

Next-Generation Converged Database Services

Over **300 major new features** plus thousands of enhancements

**Available on OCI and Azure**

Major focus on

- AI for Data features
- Developer/Analyst features
- Mission-Critical features



**Addresses data management pain points that have frustrated customers forever**

# Developers | Oracle Database 23ai Free

## Oracle Always Free ADB



Available on OCI

## ADB Free Container Image



Available for download

## Oracle Database Free



Available as RPM, Docker Image,  
VBox VM

**Very Low Cost Supported Developer Edition of ADB, BaseDB, ExaDB-D, and ExaDB-C@C**

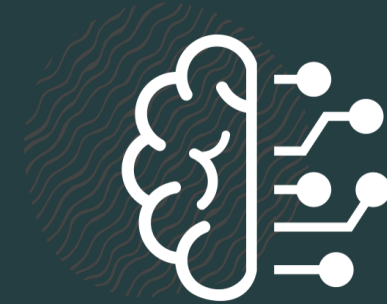
# Oracle Database 23ai - AI for Data



Algorithmic AI



AI Vector Search



Augmented Generative AI (LLMs)



Distributed AI



AI Storage



AI Developer Tools

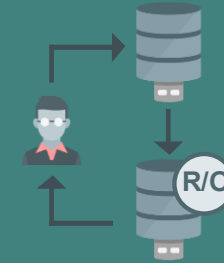
# Oracle Database 23ai



Data Usecase Domains

Schema  
Privileges

## Oracle Database 23ai



Readable  
PDB Standby

Operational  
Property  
Graphs



Real-time SQL Plan  
Management



JSON Schema



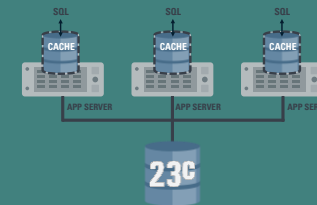
Microservice Support

JSON Relational  
Duality



AI Vector Search

True Cache



SQL Firewall

Priority Transactions



Rolling Patching

JS Stored Procedures



Developer Role

Shrink  
Tablespace

Boolean  
Datatype

Globally  
Distributed  
Database



# DDD with Jakarta Data and the Oracle Database



# DDD with Jakarta Data and the Oracle Database 23ai

- [Straightforward Data Access with Jakarta Data and the Oracle Database](#)

**jakartaee/data**

Data-API



**ORACLE** 23<sup>ai</sup>  
Database

21  
Contributors

47  
Used by

93  
Stars

26  
Forks



# Gotchas - DDD with Jakarta Data and the Oracle Database 23ai

jakartaee/**data**

Data-API

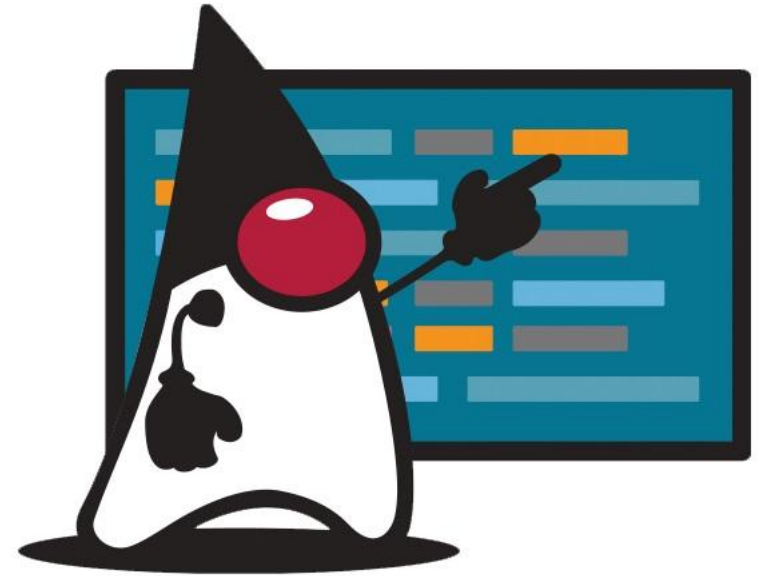


21  
Contributors

47  
Used by

93  
Stars

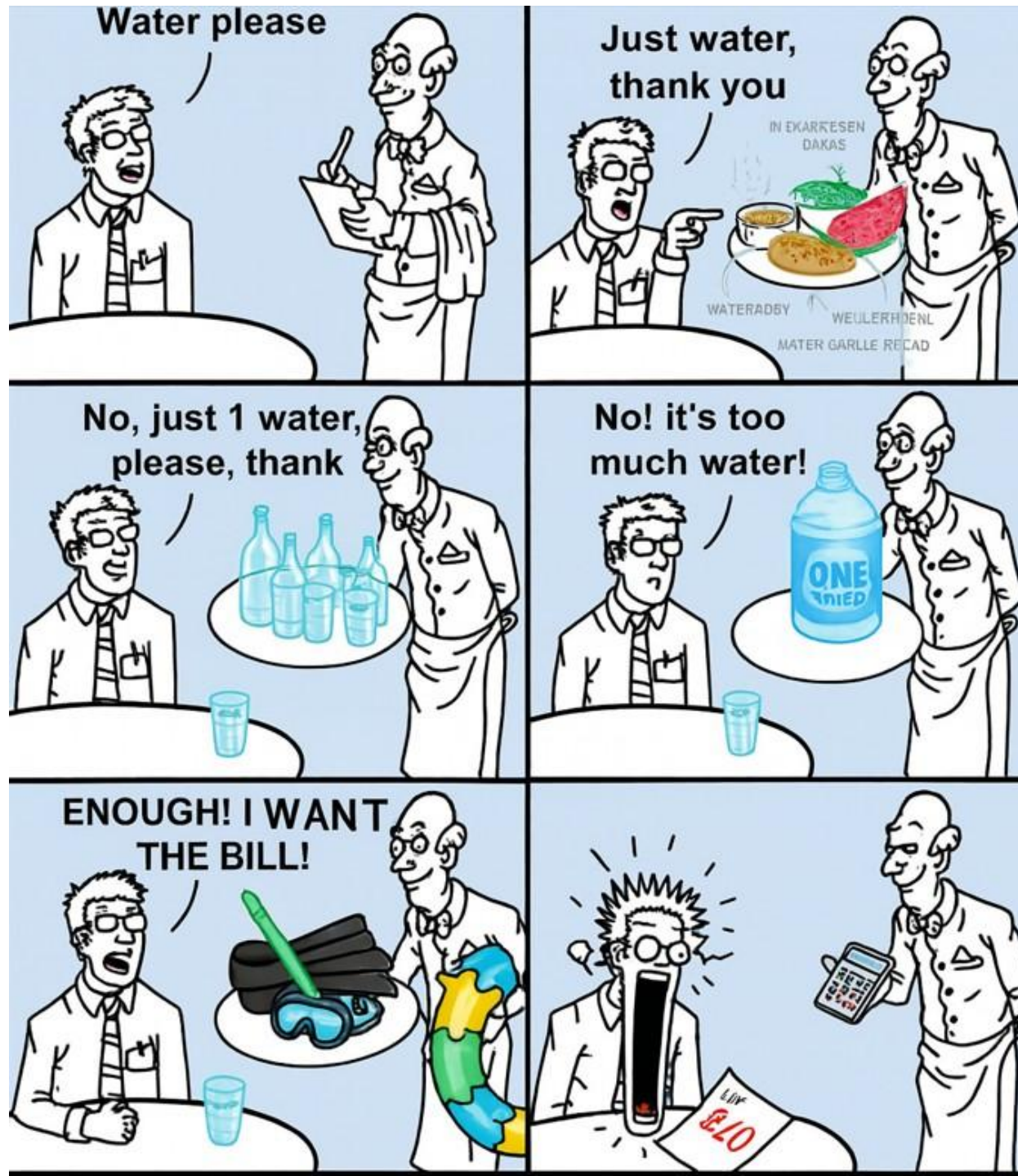
26  
Forks



ORACLE  
Database 23<sup>ai</sup>

# Vibe Coding and ReAct

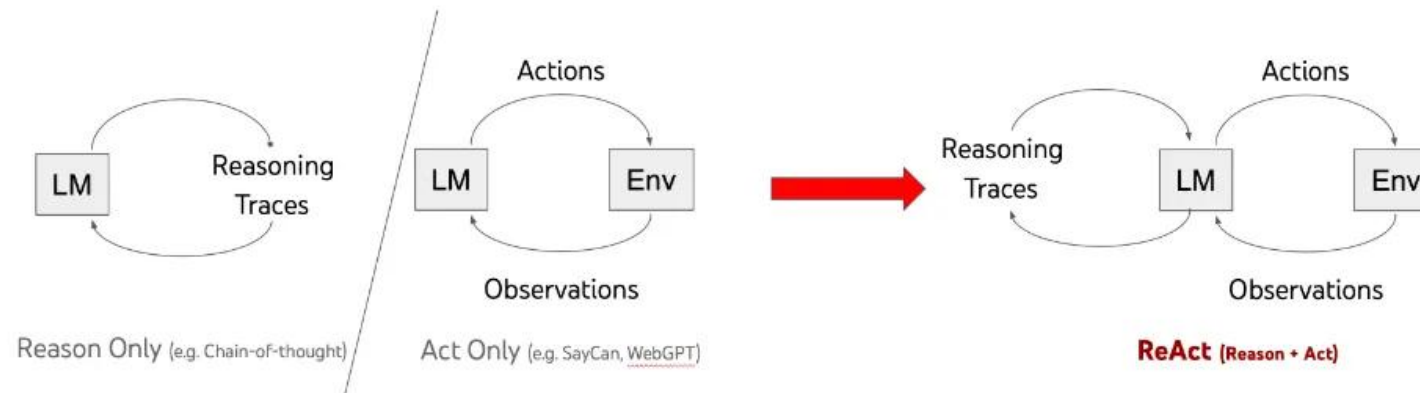




# ReAct – Reason and Act



- **Reasoning:** Use chain-of-thought (CoT) prompting to break down complex problems step by step. It allows models to do more than passively generate text.
- **Acting:** Interface with external tools or environments to gather information, execute tasks (use tools, query DBs, perform calculations), or adapt plans.



# SDD – Spec-Driven Development



# SDD – Spec-Driven Development

---



- **SDD**

- **Spec-Driven Development (SDD):** a methodology where the specification—a detailed, structured description of the desired behavior, inputs, outputs, and constraints of a system—drives the entire development process. Instead of starting with code or prototypes, developers begin with a formal spec that serves as the single source of truth.
- [AGENTS.md](#) - A simple, open format for guiding coding agents, used by over 20k open-source projects.

# SDD – Spec-Driven Development

---



## • SDD – Key Principles

- **Prompt Engineering:** Defining structured prompts and expected outputs for LLMs.Agent
- **Design:** Specifying tool interfaces, action schemas, and reasoning patterns for autonomous agents.
- **Code Generation:** Using specs to guide LLMs in generating consistent, correct, and testable code.
- **Safety and Alignment:** Ensuring AI outputs conform to predefined constraints and ethical guidelines.

# SDD – GitHub Spec Kit



## . SDD – GitHub Spec Kit

- The GitHub Spec Kit introduces a **specification-driven framework** to enhance software development by prioritizing detailed documentation, accuracy, and streamlined workflows.
- It addresses challenges of assumption-based coding by making sure **clear and actionable specifications**, reducing errors and inefficiencies when using **coding agents** like GitHub Copilot or Claude.

# SDD – GitHub Spec Kit

---



## . SDD – GitHub Spec Kit

- The framework employs a **four-step** project implementation **process: defining goals, developing technical architecture, breaking tasks into actionable units, and using test-driven(TDD) development** for accuracy.
- Key features include seamless **integration with coding agents**, command-based setup for simplified project management, and dynamic updates to project files.

# Technical References

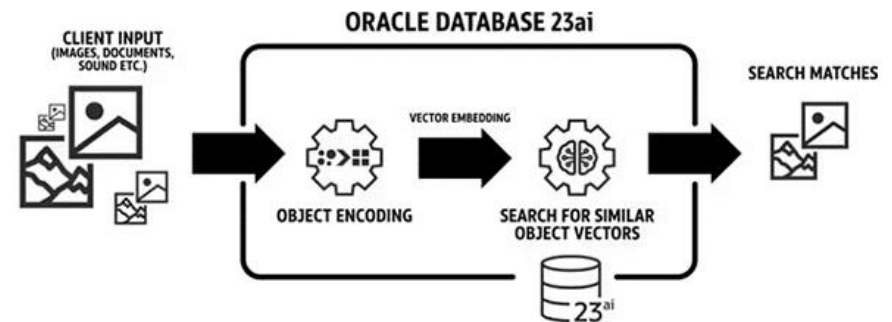
ORACLE Database **23<sup>ai</sup>**

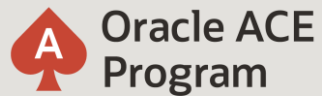
- Jakarta Data - <https://jakarta.ee/specifications/data/>
- Straightforward Data Access with Jakarta Data and the Oracle Database - <https://medium.com/oracledevs/straightforward-data-access-with-jakarta-data-and-the-oracle-database-b789b99e4c9b>
- Oracle Database 23ai <https://rb.gy/pdmwmz>
- Java / JDBC – <https://www.oracle.com/jdbc>
  - Introduction to Oracle JDBC Driver Support for Virtual Threads - <https://bit.ly/3UINJWP>
  - Developing an Oracle JDBC app with GraalVM Native Image - <https://rb.gy/iy3sgh>
  - Getting Started with Reactive Relational Database Connectivity and the Oracle R2DBC Driver - <https://rb.gy/42dnz5>
  - Getting Started with the Java library for Reactive Streams Ingestion (RSI) - <https://bit.ly/3rEiRnC>
  - Introduction to JDBC Reactive Extensions with the Oracle Database — Developer Release – <https://rb.gy/qxlrbx>
  - Pipelined Database Operations - <https://rb.gy/iy3sgh>

# Technical References

- Java / JDBC – <https://www.oracle.com/jdbc>
  - Introduction to Oracle JDBC Driver Support for Virtual Threads - <https://bit.ly/3UINJWP>
  - Developing an Oracle JDBC app with GraalVM Native Image - <https://rb.gy/iy3sgh>
  - Getting Started with Reactive Relational Database Connectivity and the Oracle R2DBC Driver - <https://rb.gy/42dnz5>
  - Getting Started with the Java library for Reactive Streams Ingestion (RSI) - <https://bit.ly/3rEiRnC>
  - Introduction to JDBC Reactive Extensions with the Oracle Database — Developer Release – <https://rb.gy/qxlrbx>
  - Pipelined Database Operations - <https://rb.gy/iy3sgh>

ORACLE  
Database 23<sup>ai</sup>





## 500+ technical experts & community leaders helping peers globally

The **Oracle ACE Program** recognizes & rewards individuals for their technical & community contributions to the Oracle community



### 3 membership tiers



Learn more - [ace.oracle.com](https://ace.oracle.com)



**Nominate**  
yourself or a candidate:

[ace.oracle.com/nominate](https://ace.oracle.com/nominate)

Connect:  [aceprogram\\_ww@oracle.com](mailto:aceprogram_ww@oracle.com)

 [@oracleace](https://twitter.com/oracleace)

 [facebook.com/OracleACEs](https://facebook.com/OracleACEs)

 [blogs.oracle.com/ace](https://blogs.oracle.com/ace)



# Oracle LiveLabs

Showcasing how Oracle's solutions can solve **your** business problems



**700+**

free workshops,  
available or in  
development

**3.5 million**

people have already visited LiveLabs

**600+**

events run using  
LiveLabs  
workshops

[developer.oracle.com/livelabs](https://developer.oracle.com/livelabs)

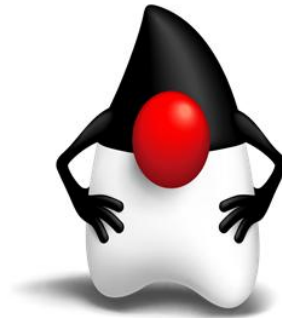
learn something new ...at your pace!



# Create your FREE Cloud Account

- Go to <https://signup.cloud.oracle.com/>

**ORACLE®**  
Cloud Infrastructure



Cloud Infrastructure

livelabs main

### Oracle Cloud Free Tier

Get started with...

Always-Free access to essential services including:

- Autonomous Database
- Object storage

Plus, \$300 of credits for 30 days to use on even more services:

- Container Engine for Kubernetes
- Analytics Cloud
- Data Integration

Account information

Country/Territory  
United States

First Name  
[Redacted]

Email  
[Redacted]

☒ I am human

**Verify my email**

Terms of Use

**Juarez Junior**



@juarezjunior

Thank  
you



ORACLE

