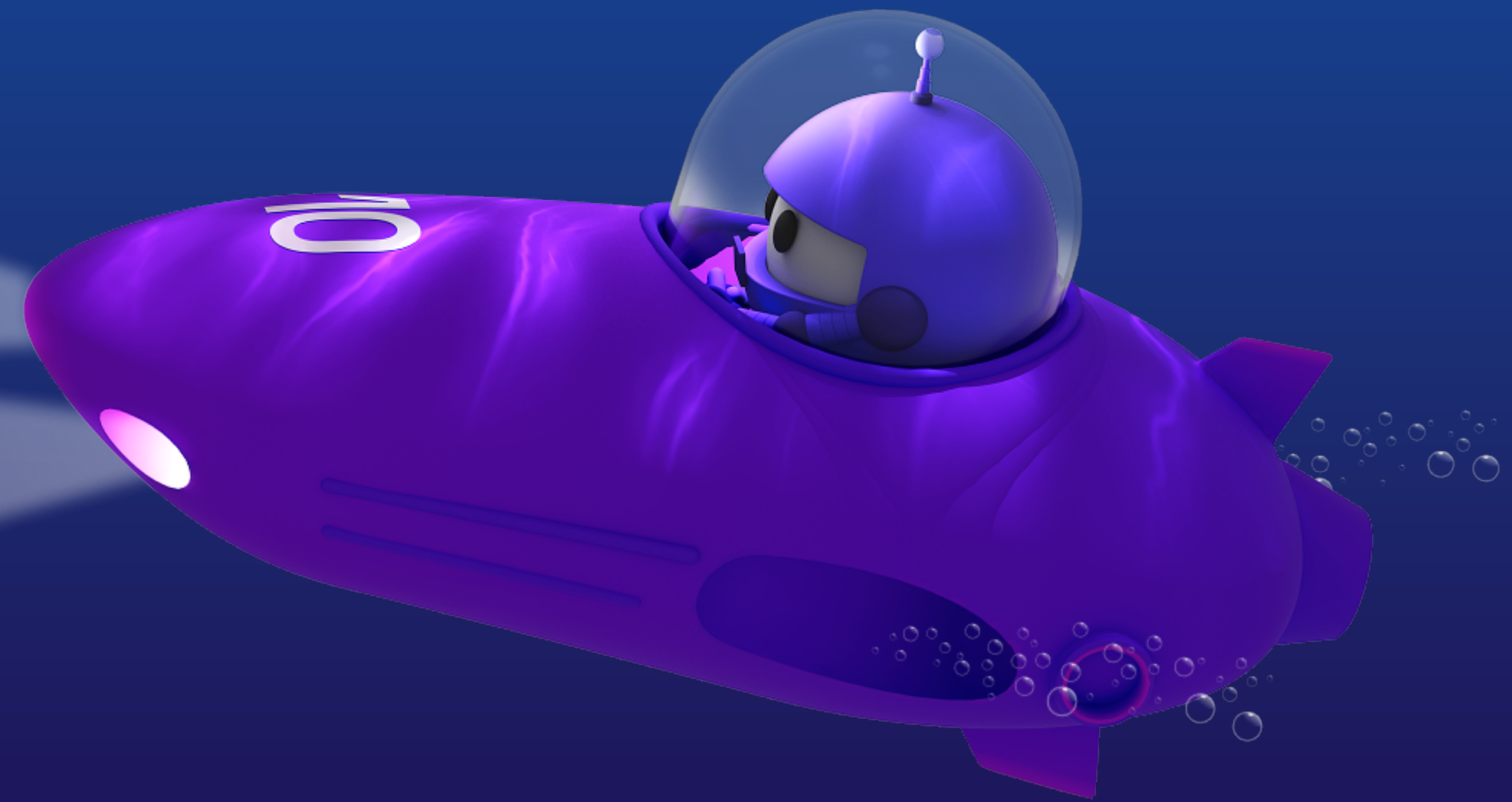


Vector Search with Entity Framework Core 10

Phong Nguyen

NashTech Technical Architect



Agenda

01

Why Vector Search?

02

Key Concepts

Embeddings, Vectors, Similarity Search

03

Vector Search with EF Core 10

SQL Server 2025/Azure SQL, PostgreSQL , Azure Cosmos DB

04

Demo

Product, Documentation, and Image Semantic Search

05

Q & A

Limitations of Keyword Search

Requires exact or near-exact keyword matching

No tolerance for typos or spelling variations

Cannot detect similar content

Synonyms often fail

What is Vector/Similarity Search?

A search method based on semantic meaning

Converts data into vectors (number arrays)

Compares vectors using similarity metrics

The more similar the meaning, the closer the vectors



("title": "How to build a REST API?")

("title": "Programming languages for data scientists")

✓ semantically similar, using ML

"Python" 🔍



Is python a
poisonous snake?

Traditional, keyword-based search

"Python" 🔍



Programming
languages for
data scientists

ML-based (semantic) search

What are Embeddings?

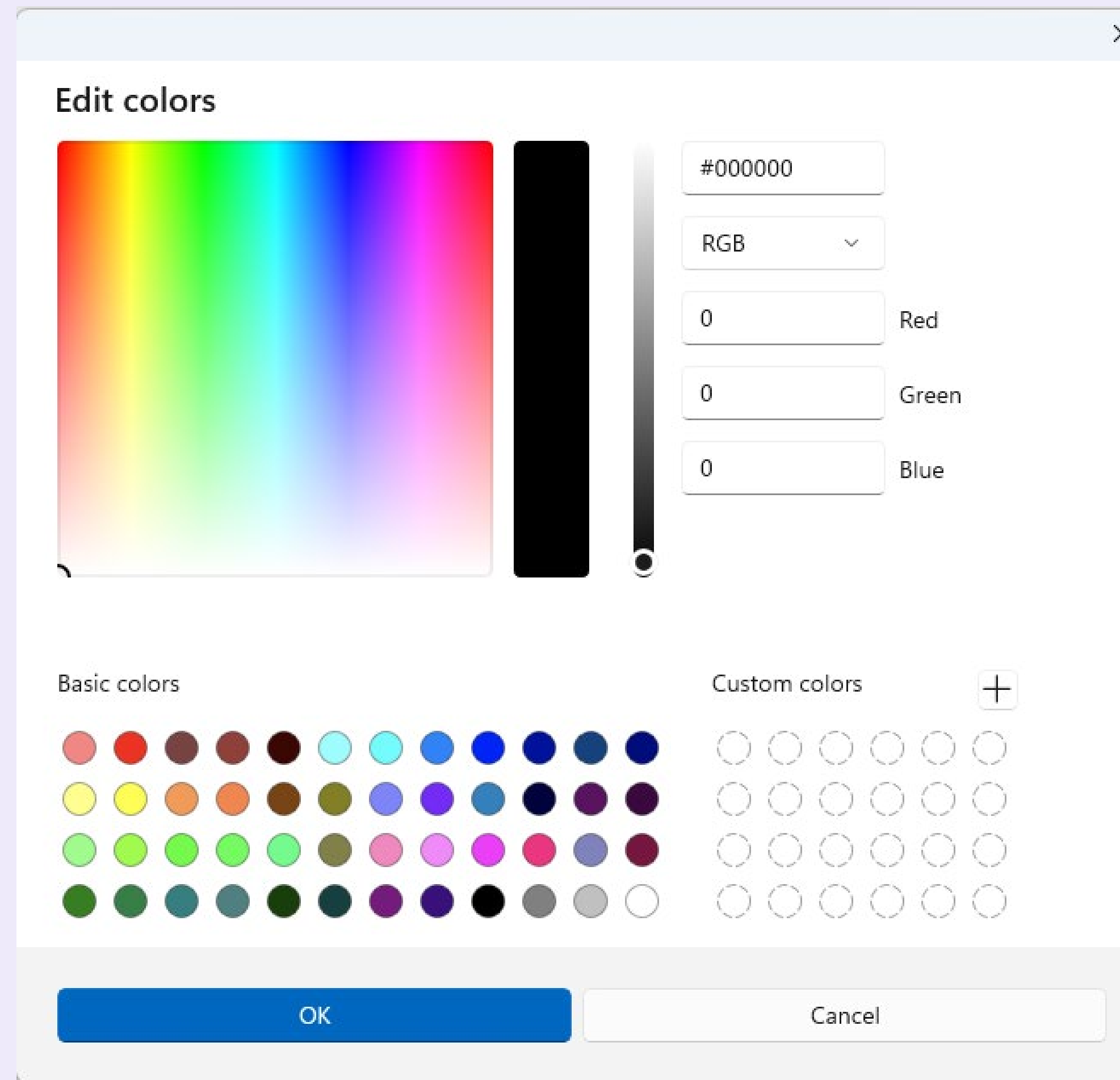
Numerical representation of text/images/documents

Generated by AI models

Example vector: [0.12, -0.33, 1.04, ...]

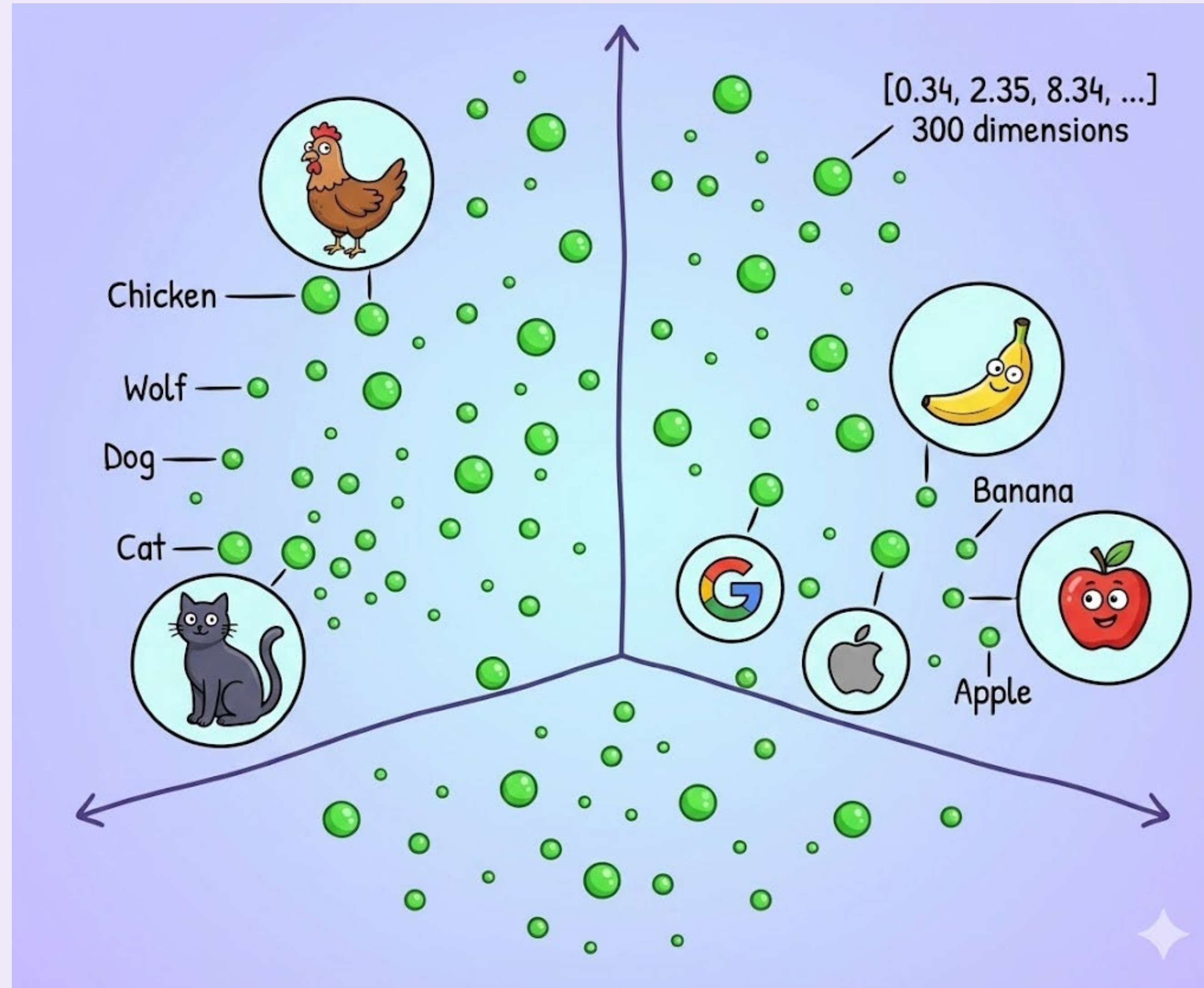
Numbers as Meaning

RGB Colors

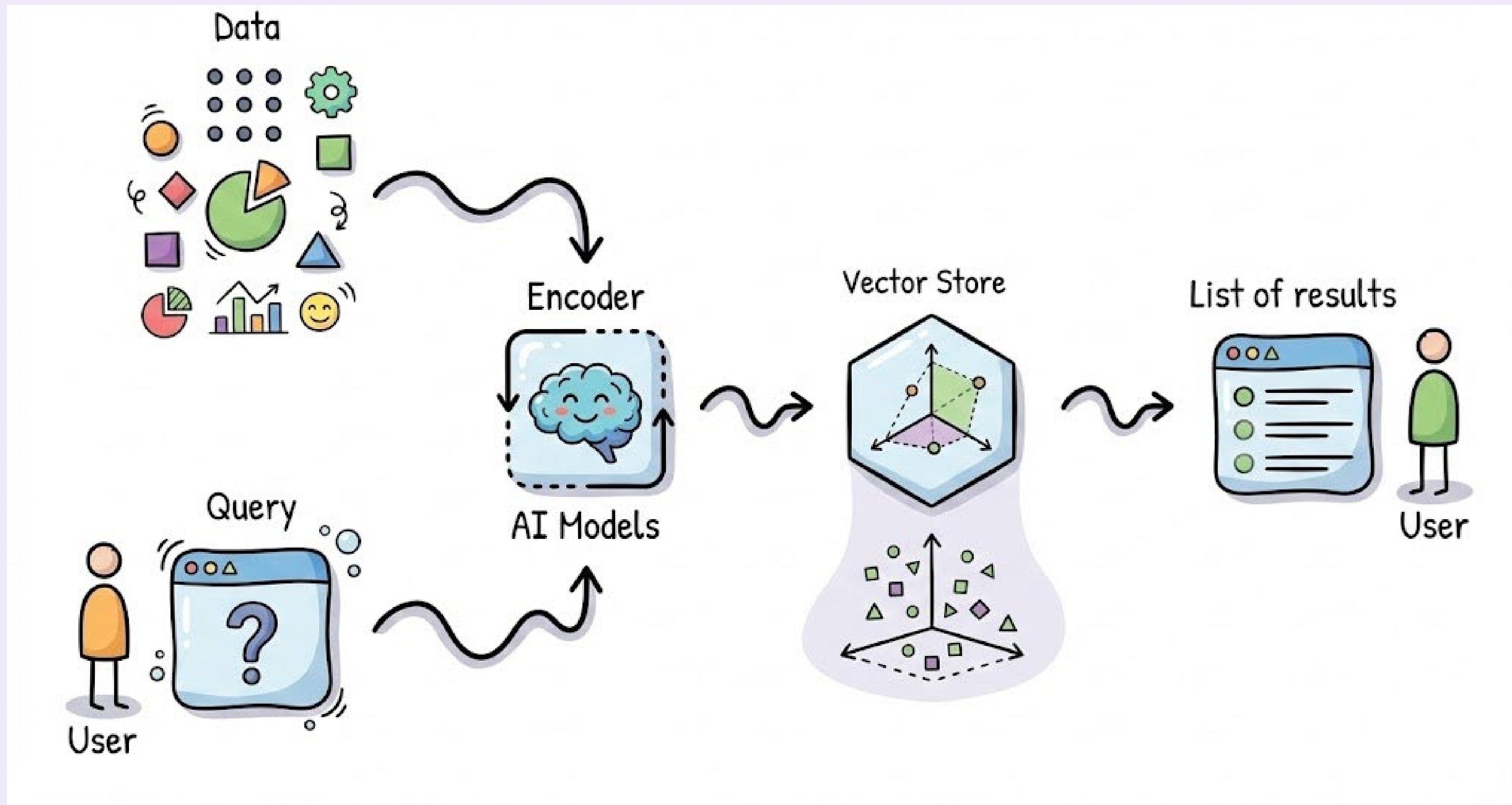


Numbers as Meaning

Vector Embeddings



Vector Search Pipeline



Vector Search with EF Core

SQL Server/ Azure
SQL



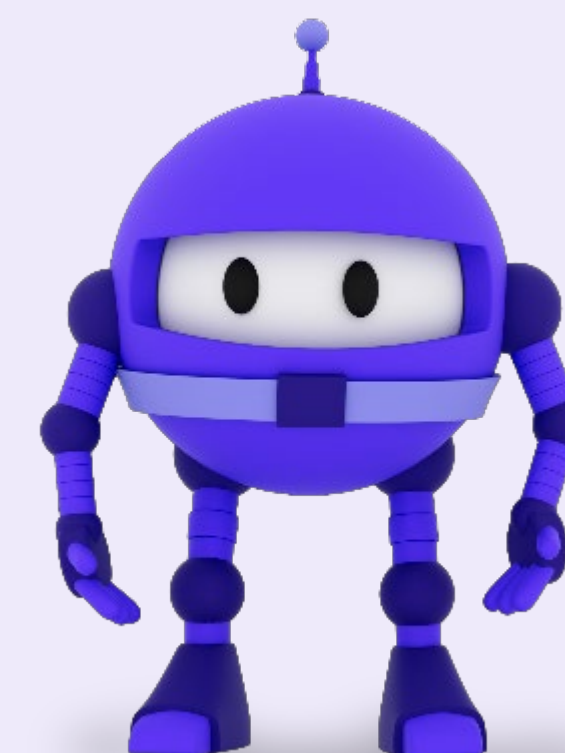
PostgreSQL



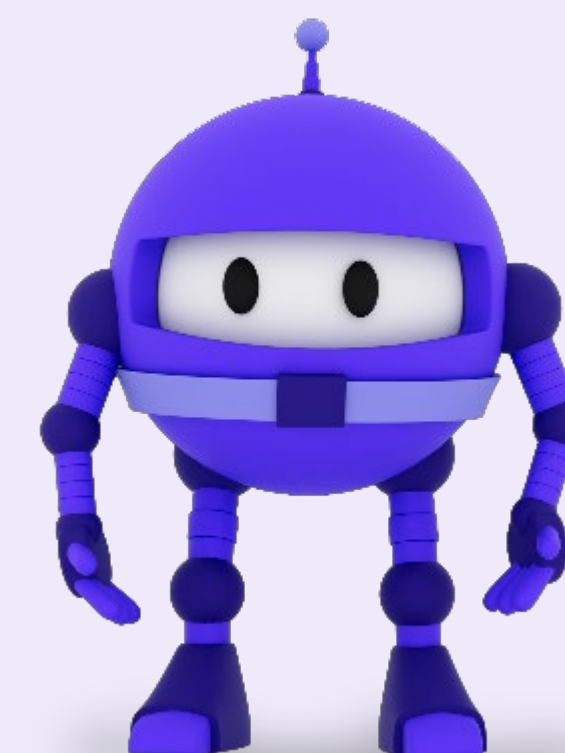
Azure Cosmos DB



Demo



Q & A



Thank you

