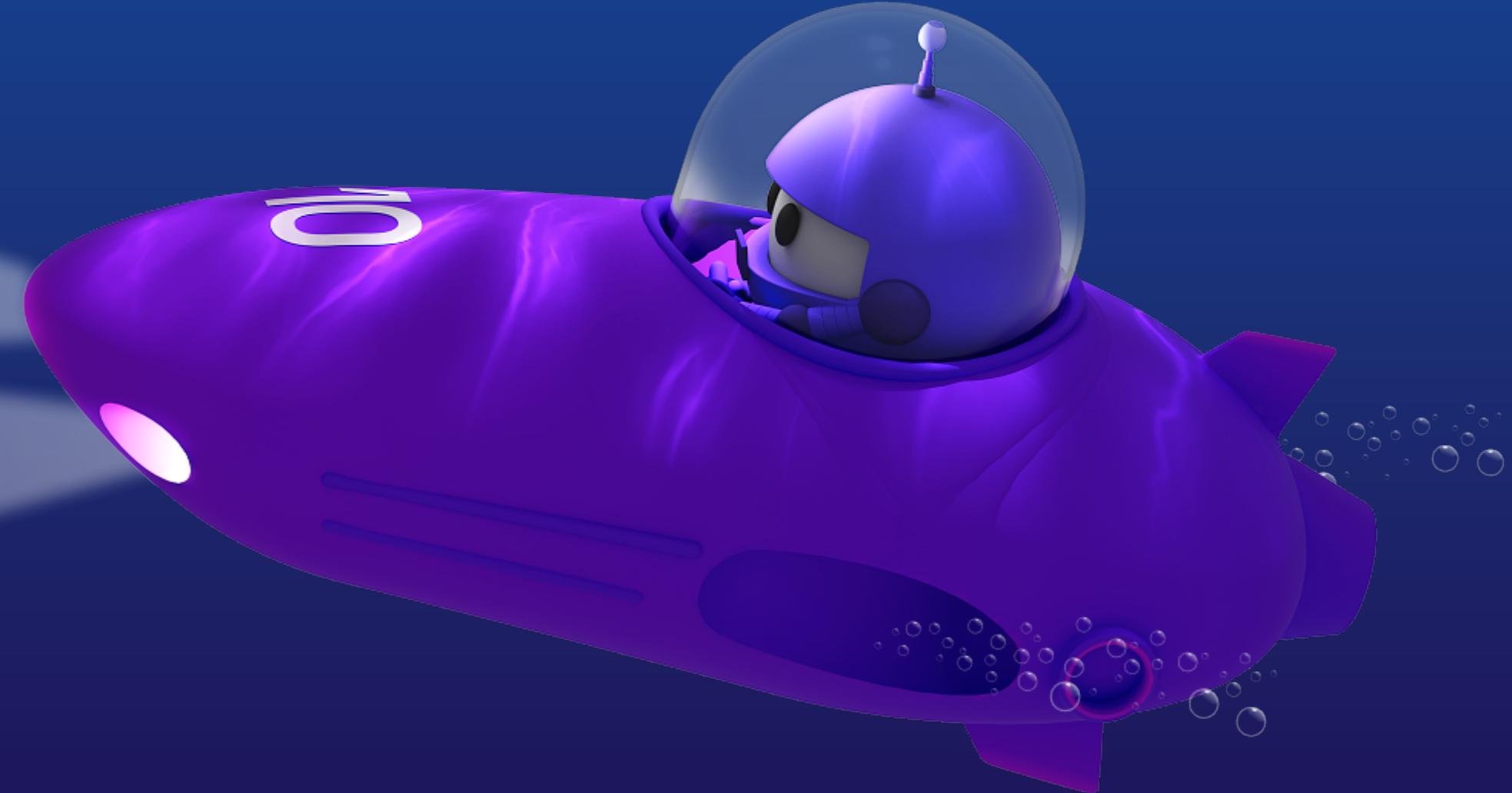




Vector Search with Entity Framework Core 10

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

The more similar the meaning, the closer the vectors

Converts data into vectors (number arrays)

Compares vectors using similarity metrics



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

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

A screenshot of a search interface. At the top is a search bar containing the text "Python". To the right of the search bar is a magnifying glass icon. Below the search bar is a cartoon illustration of a green snake with large eyes and a pink tongue. To the right of the snake is the text "Is python a poisonous snake?". At the bottom of the interface is the text "Traditional, keyword-based search".

A screenshot of a search interface. At the top is a search bar containing the text "Python". To the right of the search bar is a magnifying glass icon. Below the search bar is a cartoon illustration of a person standing next to a whiteboard, pointing at it. To the right of the person is the text "Programming languages for data scientists". At the bottom of the interface is the text "ML-based (semantic) search". A green callout bubble points from the word "Python" in the search bar to the text "Programming languages for data scientists", with the text "semantically similar, using ML" written inside the bubble.

semantically similar, using ML

What are Embeddings?

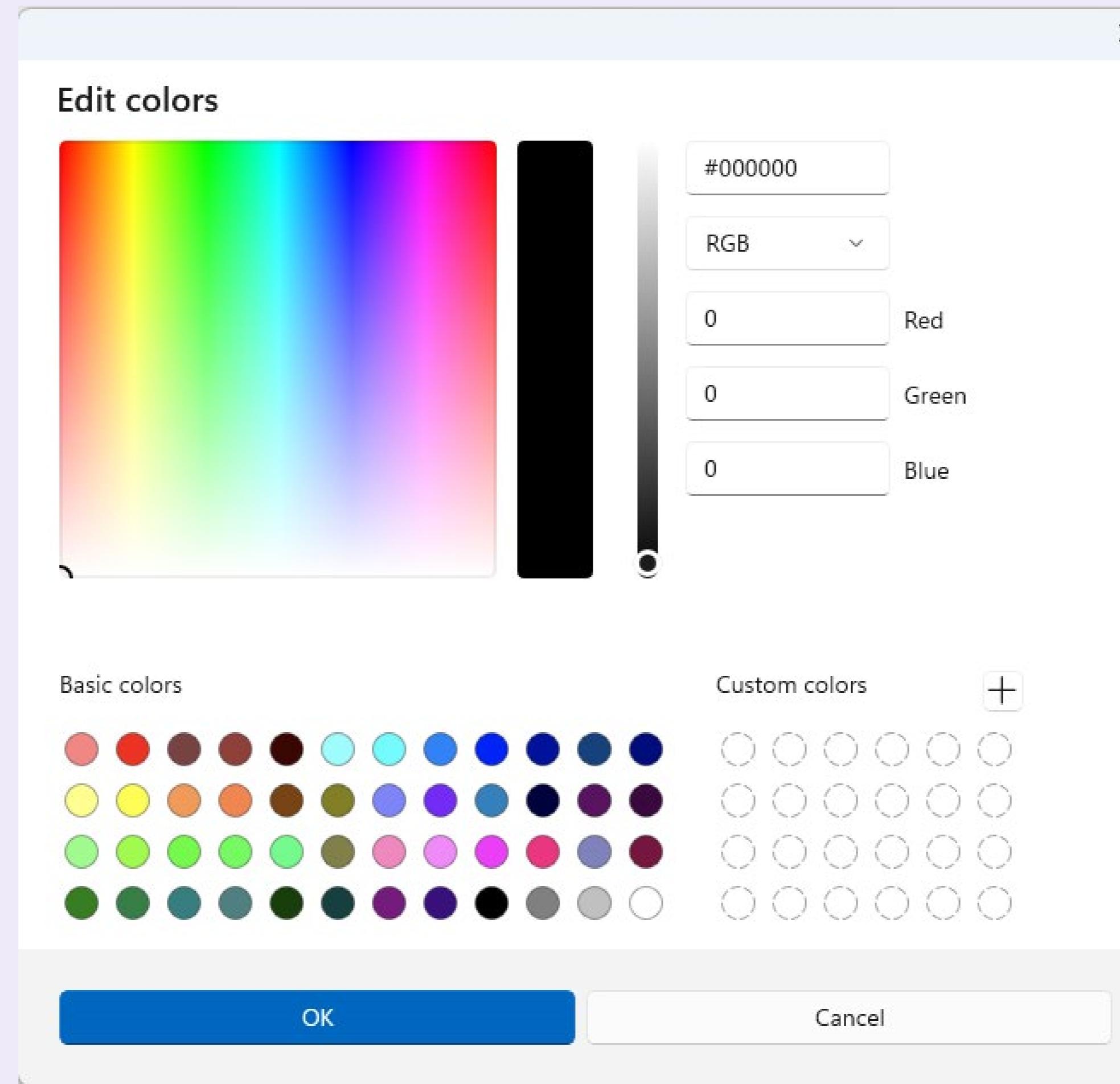
Numerical representation of text/images/documents

Generated by AI models

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

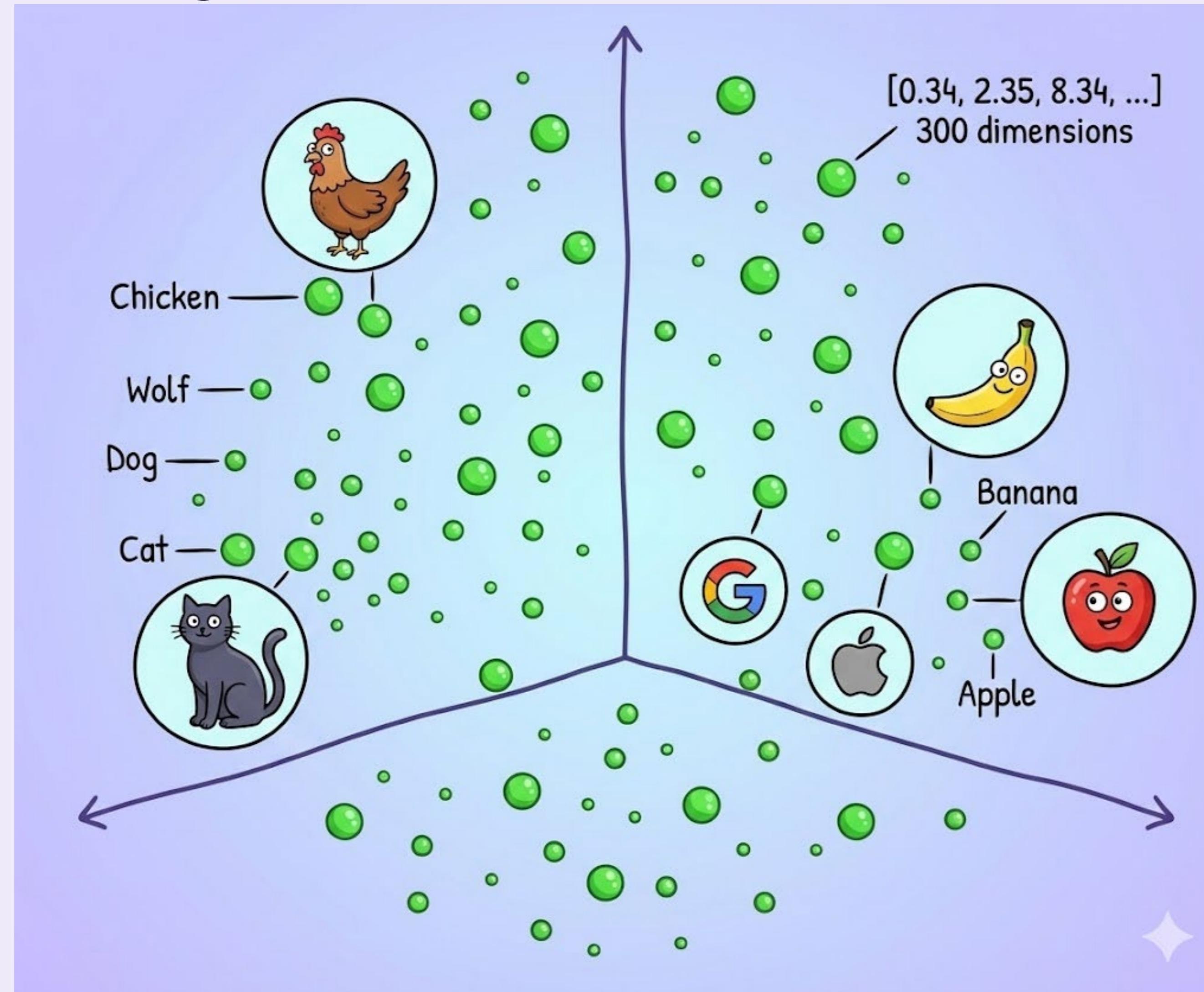
Numbers as Meaning

RGB Colors

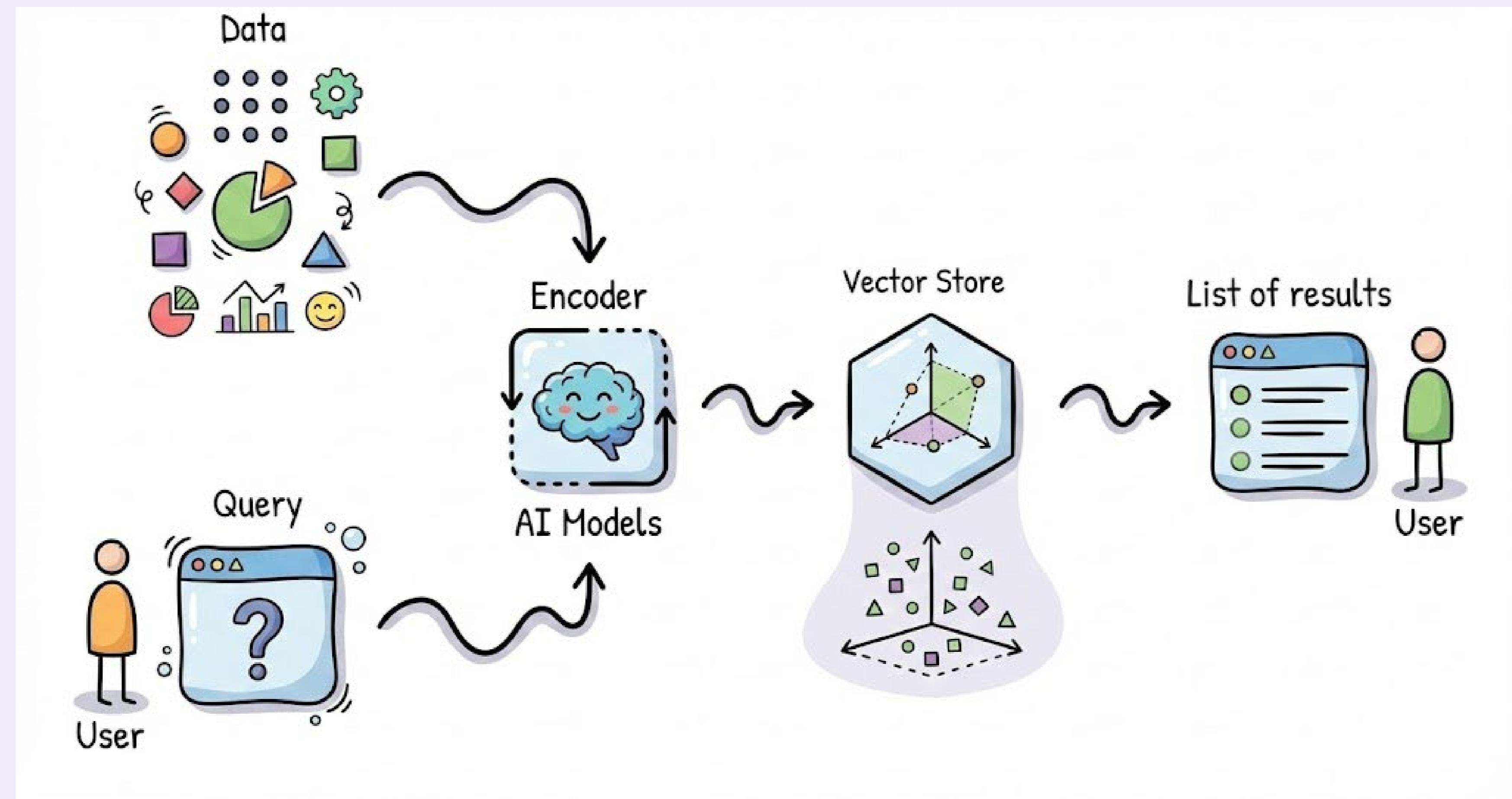


Numbers as Meaning

Vector Embeddings



Vector Search Pipeline



Vector Search with EF Core

SQL Server/ Azure
SQL



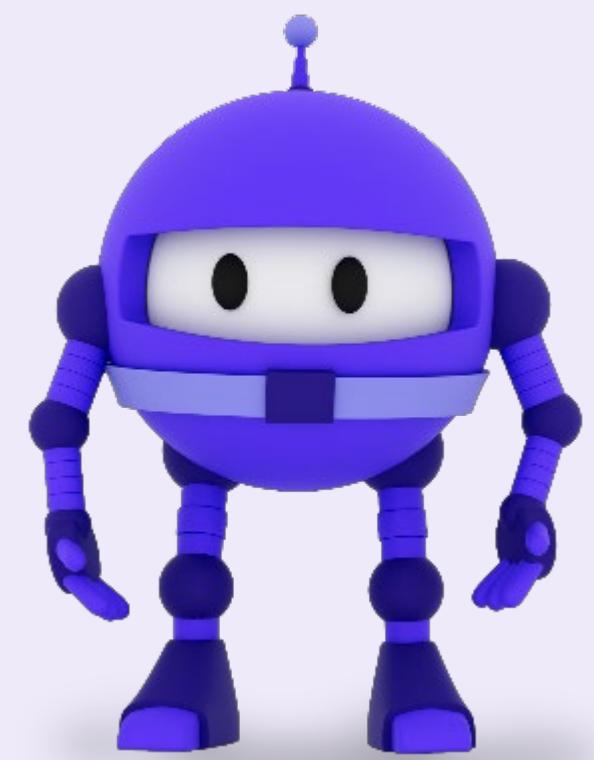
PostgreSQL



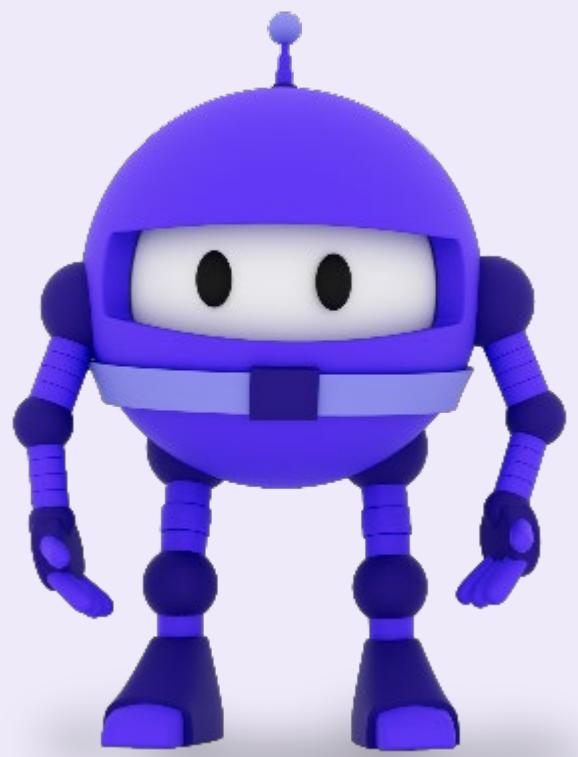
Azure Cosmos DB



Demo



Q & A



Thank you

