

Azure-ish SQL and Azure AI 101

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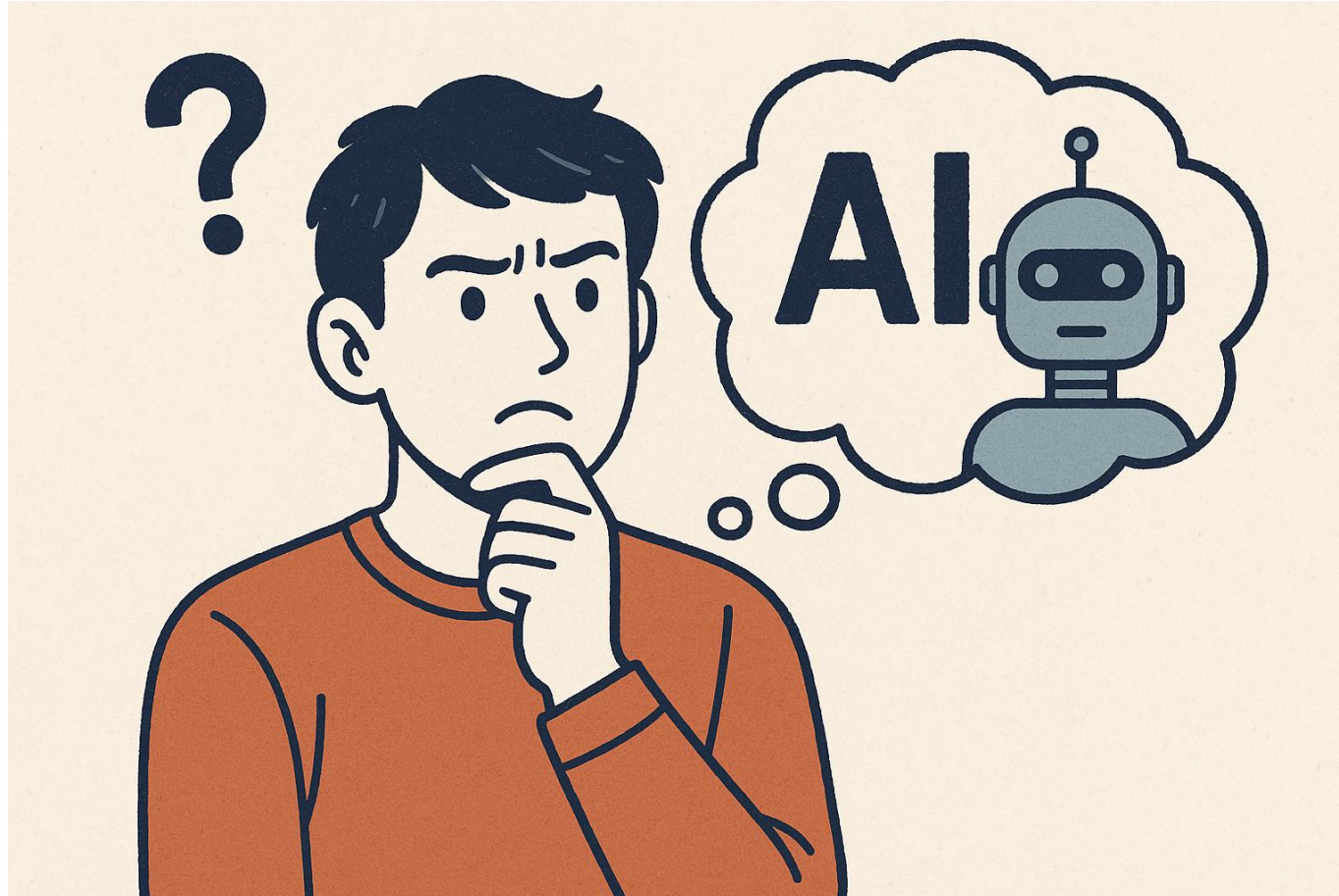
<https://sqlatspeed.com>



About Me

- Published books on Azure AI and data migration
- Data work for 20+ years, AI work for the last 8
- Microsoft MVP and Redgate Ambassador
- Lexington Data Technology Group co-organizer

What Do We Think of AI?



Where Does Our SQL Stuff Live?



Where Are We Headed Today?

- How can it help me do my daily work?
- How can it help improve my technical users' search experience?
- How can it help me describe and document?
- How can it help my non-technical users' data discovery work?
- What will I be able to do next (or even now-ish)?
- Q&A

“Copilot all the things!”

No one, ever

Copilot in SQL Server Management Studio 21

- Requires SSMS 21 and Azure OpenAI resources
 - OpenAI endpoint and model deployment
- Can talk to anything SQL Server-ish
- No need to demo setup as docs are good
- Queries executed under the user's security context

Copilot in SQL Server Management Studio 22

- Requires SSMS 22 (in Preview 3, which came a couple weeks ago)
- Requires GitHub Copilot subscription (there is a free, personal option)
- Can talk to anything SQL Server-ish
- SSMS 21 Copilot support via OpenAI continues with no updates
- Feature equivalence will take “a few releases” per Microsoft

What Can I Do With Copilot in SSMS 21?

- Use the chat window
 - Defaults to read-only but can do read-write with/without approval
- Use “assistants” in the editor window
 - Document, Explain, Fix, Refactor
- Environment discovery, test data generation, etc.
- Performance tuning?!

DEMO TIME



Want More Control of the Automagicness?

- AI-based T-SQL Refactoring [here](#)
- We can control the models used
- We can control the temperature
 - Low means more deterministic
 - High means “more creative”
- GitHub repo [here](#) – let’s take a look...

Vector Support in Azure-ish SQL

- GA in Azure SQL now, preview in SQL Server 2025 (preview)
- Azure SQL Devs' Corner best Azure SQL/AI resource online (link on Resources slide)
- What is actually supported?

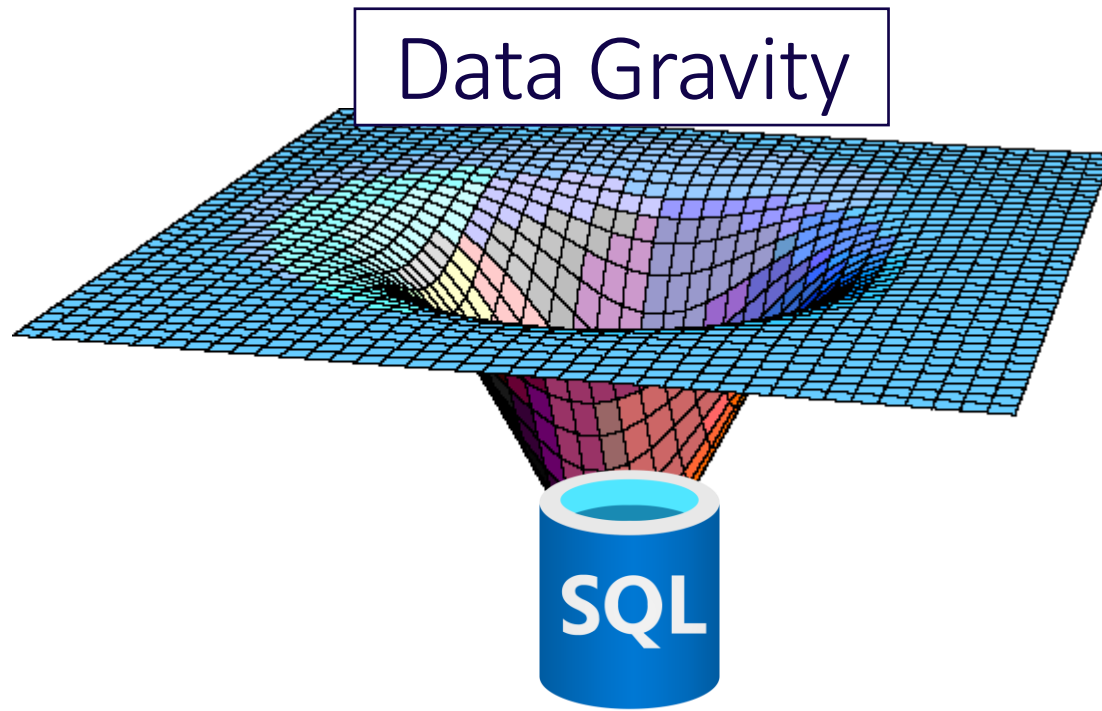
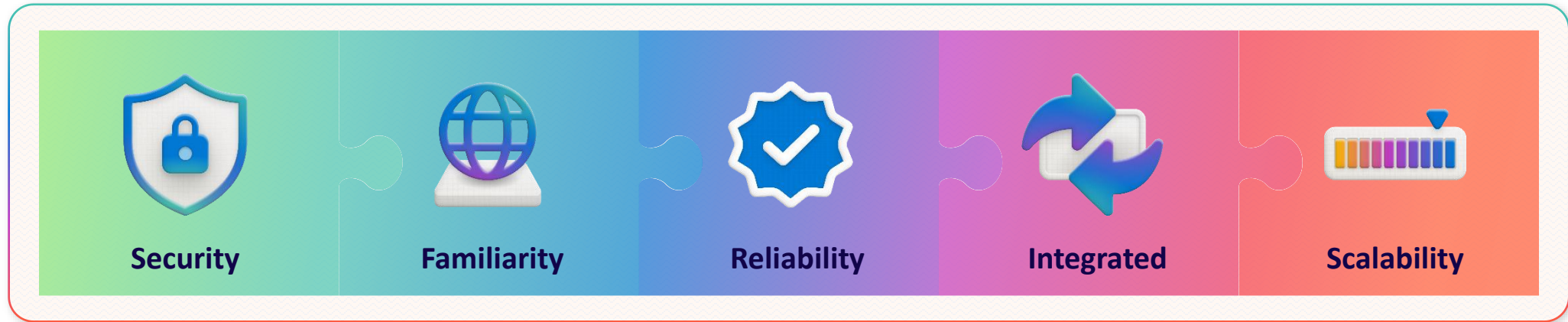
What's Supported for Vectors, Victor?

- New VECTOR data type
- Built-in VECTOR functions
 - VECTOR_DISTANCE
 - VECTOR_SEARCH
 - VECTOR_NORM
 - VECTOR_NORMALIZE
 - VECTORPROPERTY
- CREATE_VECTOR_INDEX w/ DiskANN (w/ new ops)
- So what does any of this actually mean?

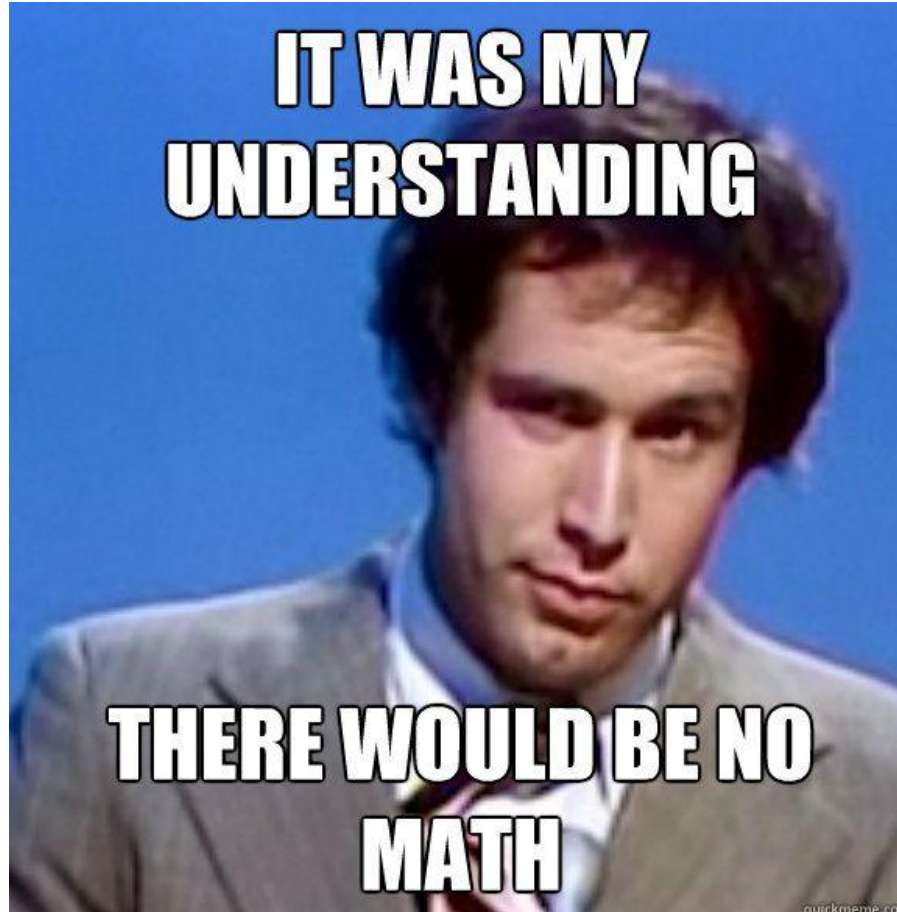
Why SQL for AI apps?



Why SQL for AI apps?



Apologies in Advance...



Vectors and Embeddings

Feature Vector

Ordered array of numbers typically created by a human to train a model

[Height, Weight, Age, Fur Length, Energy Level]

Embedding

Vector generated by a model that has semantic meaning

dog: [0.9, 0.3, 0.2, ...]

Image of a dog: [0.9, 0.3, 0.2, ...]

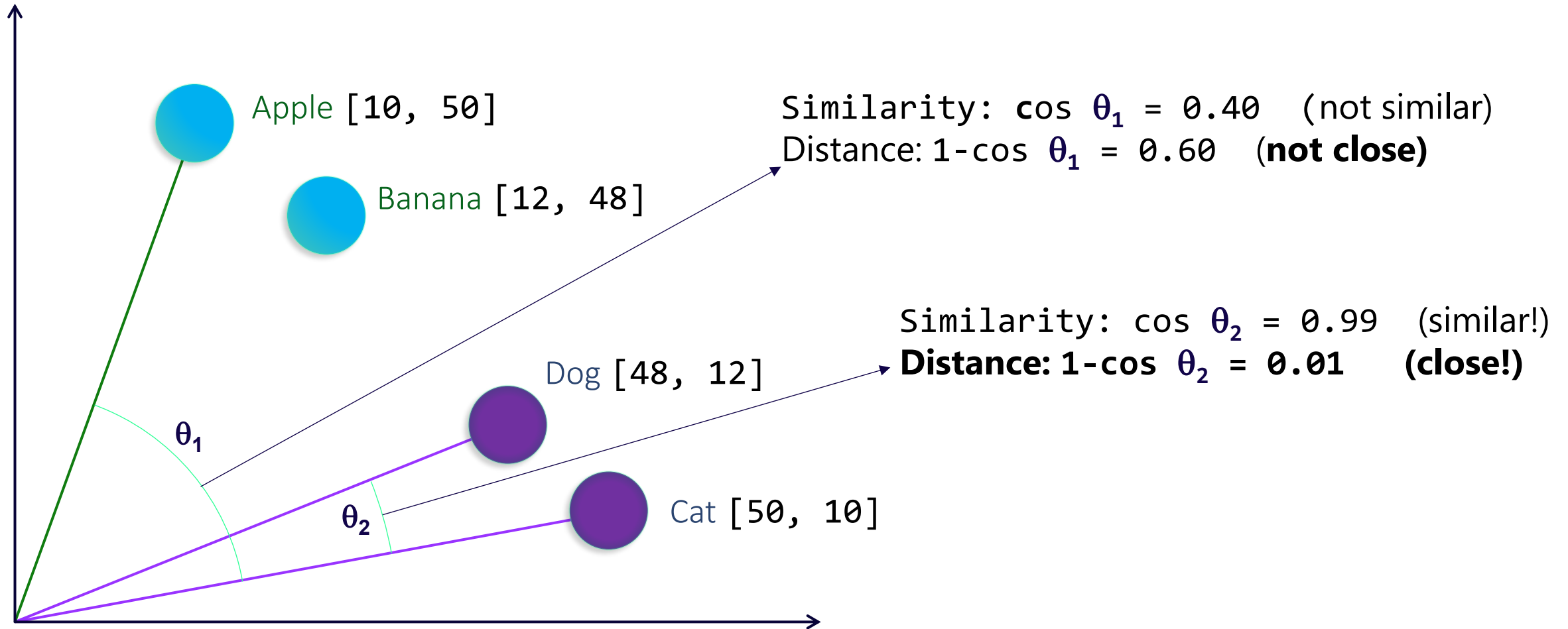
puppy: [0.88, 0.33, 0.21, ...]

"I took the dog for a walk": [1.5, -0.8, 2.1, ...]

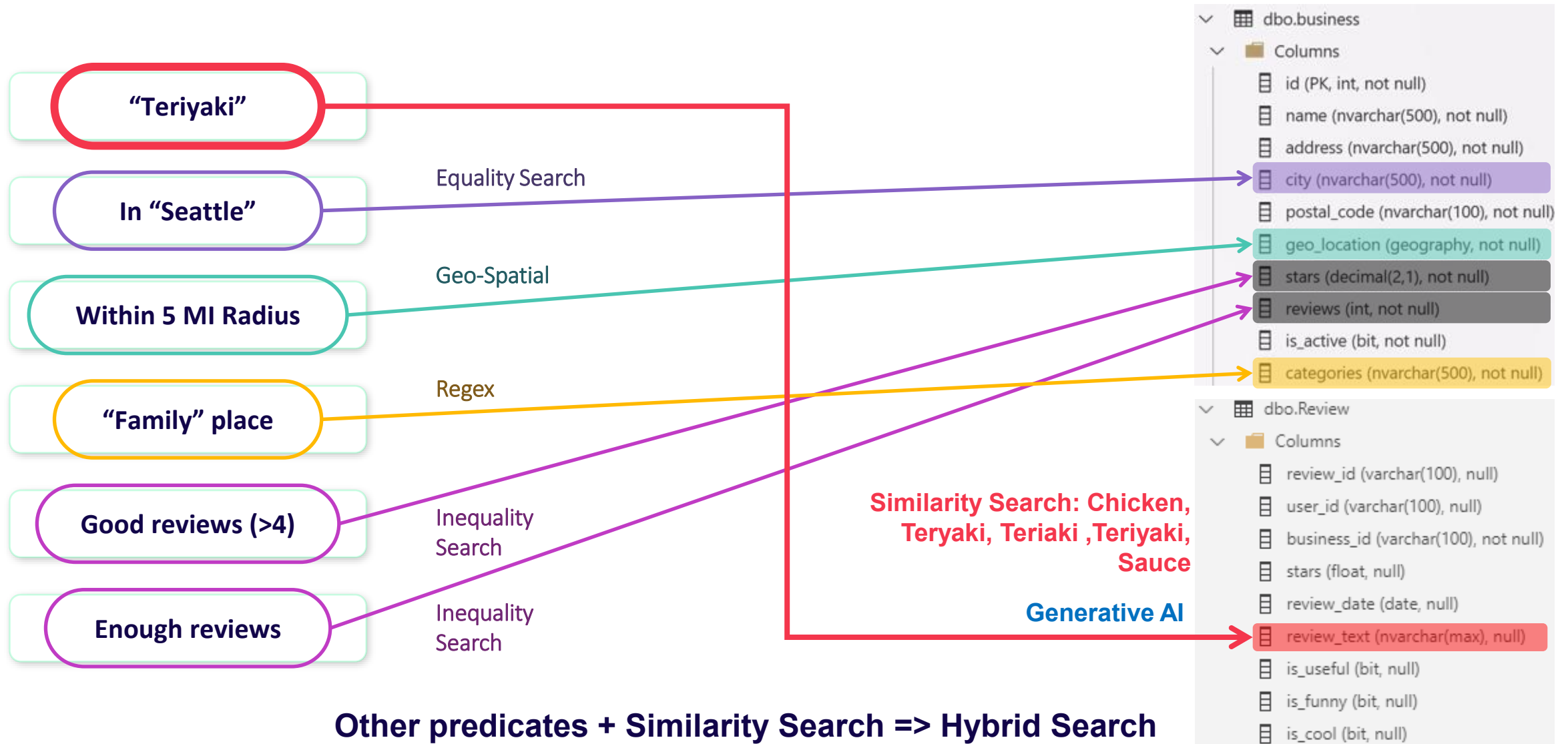
“dog”



Similarity Searching using Cosine



Why vectors in a modern relational database?



What Can I Actually Do With Vector Support?

- Semantic search
- Retrieval-augmented generation (RAG)
 - Great dev-heavy RAG accelerator on Resources slide
- Chat experiences
- Conversational agents

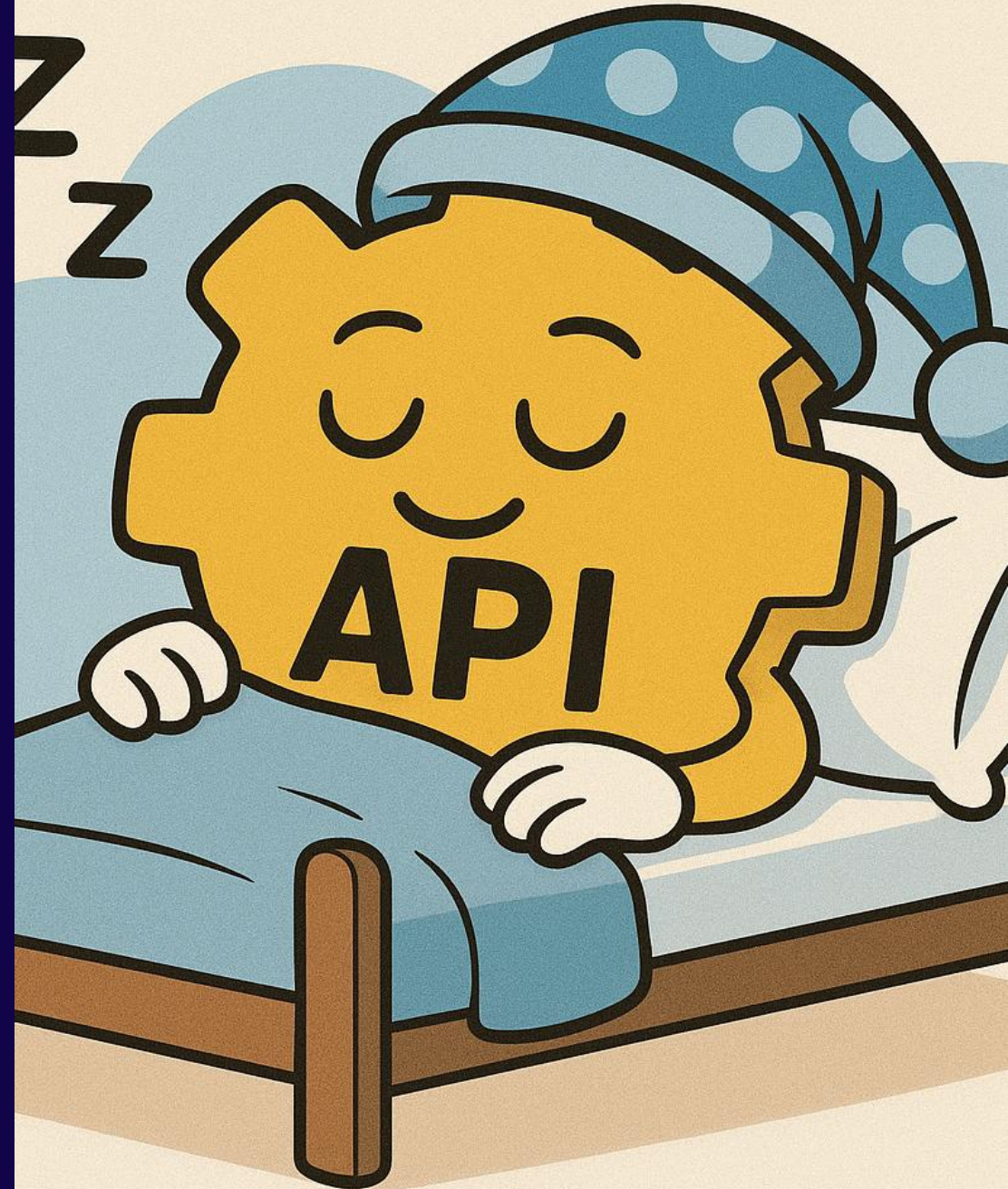
After that complex math, back to T-SQL...



What AI Things Can I Do With T-SQL?

- SP_INVOKE_EXTERNAL_REST_ENDPOINT
- Breaks us out of the Azure AI ecosystem if desired
- Breaks us out of most of this AI silliness if we want!
- Let's see what we can do...

DEMO TIME



Why Else Would I Call APIs in SQL?

- Read the contents of a file from Azure Blob Storage
- Send a message to an Azure Event Hub*
- Read (and write) a file to Azure File Storage
- Other ideas?

Enough Code, Time for Clicky Clicky

- What if I just want users to be able to talk to my Azure SQL Database?
- What if my developers just want to interact with my database using a chat interface?
- What if I just want to play a little bit?
- Off we go...

DEMO TIME



So What's Next for SQL and Azure AI?

- MCP Server for SQL Server
 - Open standard designed to allow AI agents to talk to external resources
 - More information and quick start on resources slide
- Fabric Data Agents
 - Natural language instructions, prompts, and conversation with all Fabric data EXCEPT SQL in Fabric
 - New at FabCon Vienna, it CAN connect to mirrored databases in Fabric

What's Next for Us?

- Is this a lot? Yes!
- GitHub AI samples from Microsoft are a great way to see what they're thinking
 - Link on Resources slide
- Do I have to know and keep up with all this stuff?
 - It depends...

Resources

- Azure SQL Devs' Corner:
<https://devblogs.microsoft.com/azure-sql/>
- Native Vector Type/Functions GA Announcement:
<https://devblogs.microsoft.com/azure-sql/announcing-general-availability-of-native-vector-type-functions-in-azure-sql/>
- Great podcast explainer around DiskANN indexing:
<https://www.youtube.com/watch?v=0KWFgKPXdu0>
- 5-Minute RAG SQL Accelerator:
<https://github.com/Azure-Samples/azure-sql-db-vector-search/tree/main/5-Min-RAG-SQL-Accelerator>

Resources (continued)

- Introducing MSSQL MCP Server (preview): <https://devblogs.microsoft.com/azure-sql/introducing-mssql-mcp-server/>
- Microsoft repo of Azure AI/Azure SQL samples: <https://github.com/Azure-Samples/SQL-AI-samples>
- (Mostly) T-SQL Chatbot sample: <https://github.com/Azure-Samples/azure-sql-db-chatbot>
- Walkthrough of Fabric Data Agents and their agentic integrations: <https://medium.com/@meetalpa/microsoft-fabric-data-agent-complete-guide-e6c157fd4a48>

Thank you

See you at PASS Summit?

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