

# Leverage AI Tools to Accelerate Learning in Data Science

**Matt Hamilton**

*Co-founder, Head of DevRel - ASIMOV Protocol*

# My Journey

**University** (CompSci) → **Netsight** →  
**enquos** → **IBM** → **Ripple** → **Protocol Labs**  
→ **Arbitrum** → **ASIMOV**

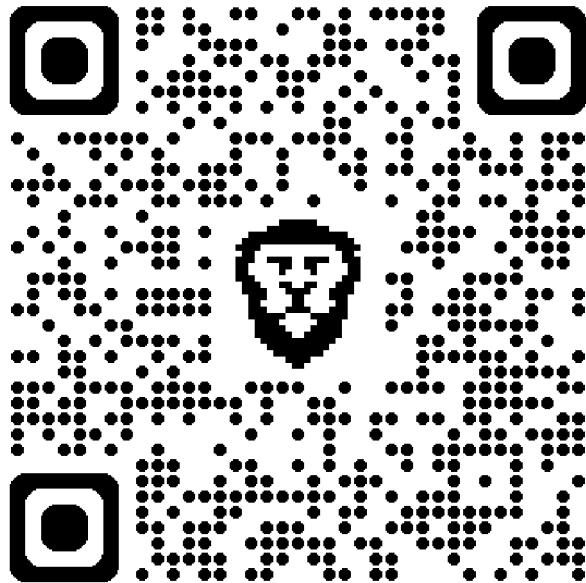
- Moved to Barbados in 2020 on the Welcome Stamp during the pandemic
- Building blockchain/AI systems from here
- Paddleboarding with my dogs
- Wukkin up (with a concrete waistline)



# Today's Plan

1. Context
2. Real Projects from Barbados
3. AI Tools You Can Use Today
4.  Prompting Challenge
5. Context Engineering
6. AI Toolkit
7. Careers & Next Steps

# Slides and Resources



<https://github.com/hammertoe/AIPromptingWorkshop/>

# From Sugar Cane to Source Code

- Barbados exports: sugar cane, tourism, culture → what else can we export?
- AI is the great equalizer – all you need is a laptop and internet
- You can build tools the world uses, from right here



# The Context

“ The AI revolution is not being written in Silicon Valley... it's coming from Manila, from Bridgetown, from Nairobi ”

Kate Kallot, Founder & CEO, Amini  
AI For Good Summit, 2025



# The AI Revolution

- <1% of data centers in Africa (and none in Barbados!)
- Constraint = innovation
- Local context creates better AI



# The Great Shift

**Then:** You needed steel mills,  
factories, oil rigs

**Now:** Laptop + LLM + curiosity

Global competition has been  
democratized.



# Workshop Goals

-  Use AI tools as creators, not just consumers
-  Learn real-world prompting skills
-  Build smarter, not bigger
-  Solve local problems with global relevance

# Real Projects from Barbados

*Proof AI isn't just for Silicon Valley*

# WeOutside246.co

m

**Problem:** Events scattered on IG

**Solution:** AI finds and structures event data

- LLMs (OpenAI) + Python
- Instagram scraping using Apify
- Event tagging & parsing
- Scheduled tasks run on Google



# Leverage AI Tools to Accelerate Learning in Data Science

The screenshot displays a grid of event posts from a social media platform. At the top, a large post features a photo of a crowded party with the text "We Outside!" and a subtitle: "De bare facts bout all de hottest fetes in Blm! Your AI guide to parties, concerts, fetes and sweet times. We does find dem automatically so you never miss de vibes." Below this, there are several smaller event posts:

- Tipsy Music Festival 2025: Day 1 at TMF Beach**  
Sat, Jul 19  
TMF Beach, Copacabana Beach Club, Barbados  
Soca, Cropover, Beach, Music, Fete, Festival, Party
- Scotiabank Junior Monarch Finals 2025**  
Sat, Jul 19  
Willey Gymnasium, Garfield Sobers Complex, Willey, St. Michael, Barbados  
Surf Rat & Menace, C-Four, Raw Gas, Tyla, Machel Montano, Soca, Cropover, Beach, Music, Fete, Festival
- Sunshine Snacks AffinityPlus Junior Kadooment 2025 at National Botanical Gardens**  
Sat, Jul 19  
National Botanical Gardens, Bridgetown, Barbados  
Alison Hinds, Tae, Mikey, Peter Ram, LIVE DJs, Tuk Band, Various DJs, Cropover, Soca, Festival, Parade, Music, Family, Culture, Fete, Jouvert, Junior, Masquerade, Other, Cultural
- twistedbarbados and barbados**  
52.3K followers  
View profile
- Scotiabank JUNIOR MONARCH FINALS**  
SATURDAY, JULY 19, 2025  
Willey Gymnasium, Garfield Sobers Complex, Willey, St. Michael  
7:00PM ADM | ADULTS \$25 | CHILDREN \$10
- Pilgrim Road Customer Appreciation Day with Live Performances**  
Sat, Jul 19  
Carter's Pilgrim Road, Christ Church, Barbados
- Pop-Up Party at De Thirsty Lizard**  
Sat, Jul 19  
De Thirsty Lizard, Bridgefield, St Thomas, Barbados
- Junior Kadooment & Junior Monarch Finals 2025**  
Sat, Jul 19  
National Botanical Gardens and Garfield Sobers

The screenshot displays a grid of event posts from a social media platform. At the top, a large post features a photo of two women at a brunch with the text "Rosé Brunch at The View (Crop Over Season Launch)". Below this, there are several smaller event posts:

- Rosé Brunch at The View (Crop Over Season Launch)**  
Sat, Jul 19  
The View: Kitchen + Bar  
Live DJ, Brunch, Music, Cropover
- dineattheview**  
The View: Kitchen + Bar  
View profile
- Motion: The Beach Party at Copacabana**  
Sat, Jul 19  
Copacabana, Barbados  
Beach, Cropover, Soca, Party
- motion\_enterpr...**  
992 followers  
View profile
- Souse, Rum & Soca x School Hall Back to School Fete**  
Sat, Jul 19  
THE Thiki Bar – Top of Rendezvous Hill, Barbados  
Faith Callender, DJ Robbi, Sympa, Soca, Cropover, Music, Fete
- souserumandsoca and \_ho**  
2,323 followers  
View profile
- ROSE Brunch**  
SATURDAY & SUNDAY  
10AM - 3PM  
MIMOSAS • LIVE DJ • ROSE BUBBLES  
\$60 FOR 2 HOURS BOTTOMLESS MIMOSAS OR ROSE  
3-COURSE SPECIAL \$160 INCLUDES 2 HOURS BOTTOMLESS MIMOSAS OR ROSE  
Prestonians: (246) 626-7749 | www.dineattheview.com
- View more on Instagram**
- Unmasked Sandi Gras Beach Masquerade**  
Sat, Jul 19  
Paul Owens At The Beach House, Barbados  
Cropover, Beach, Music, Masquerade
- unmasked\_events**  
Paul Owens At The Beach Hc  
View profile
- Buzz Crop Over Edition**  
Sat, Jul 19  
Zouk Night Lounge, Barbados  
Soca, Cropover, Music, Party
- zoukbartbados**  
11.8K followers  
View profile
- Trouble in Paradise: Cropover 2025 Schedule**  
Sat, Jul 19  
Barbados  
DJ C-FOUR, DJ Sinistar, Soca, Cropover, Music, Cruise, Jouvert, Brunch, Beach
- djfour**  
Just Jay King, Grateful Co-Livin' Fast (In the Moment)  
View profile
- CROP OVER 2025 SCHEDULE**  
JULY 19TH - 20TH, 2025  
ENTRANCE: WOMEN \$30 | MEN \$30  
Watch on Instagram
- ZOUK**  
JULY 19TH - 20TH, 2025  
ENTRANCE: WOMEN \$30 | MEN \$30  
Watch on Instagram
- FOUR TROUBLE**  
JULY 19TH - 20TH, 2025  
ENTRANCE: WOMEN \$30 | MEN \$30  
Watch on Instagram

# LLM Data Extraction



```
1 {  
2   "artists": [  
3     "Jus Jay",  
4     "Ovadose",  
5     "Legacy Team",  
6     "Surf Rat & Menace",  
7     "C-Four",  
8     "Raw Gas"  
9   ],  
10  "isEvent": true,  
11  "location": "Copacabana Beach Club, Barbados",  
12  "eventDate": "2025-07-19",  
13  "eventName": "TMF Beach - Tipsy Music Festival Day 1 at Copacabana Beach Club",  
14  "eventType": [  
15    "SOCA",  
16    "CROPOVER",  
17    "BEACH",  
18    "MUSIC",  
19    "FETE"  
20  ],  
21  "reasoning": "The image is a professional event poster for 'Tipsy Music Festival' Day 1, clearly stating the date (19th July 2025), time (12PM-8PM), and location (Copacabana Beach Club, Barbados). The caption and hashtags reinforce the Barbados location and Crop Over context. The DJ lineup matches both the image and caption. The event is a beach party/fete with strong soca and Crop Over associations, and all details are presented in English. No conflicting location or date info is present.",  
22  "confidence": 98,  
23  "validUsernames": [],  
24  "extractedContent": {  
25    "text": "The beach vibes 🌴bout to be serious! 🌴☀️ TMF Weekend kicks off on Saturday, July 19 with Day 1: beachwear, big vibes and pure bliss 🌴☀️\nHere's your DJ lineup bringing the heat to @copacabanabb\n\nJus Jay\nOvadose\nSurf Rat & Menace\nLegacy Team\nDJ C Four\nRaw Gas\n\nDon't get caught outside 🌴 grab those tix NOW cuz entry by ticket only! 🎟\n\n⚠️ Warning: This ain't no ordinary beach party - issa BEACH FETE. 🌴 Vibes? Mad. Energy? Certified. Let's go! 🎉\n\nDAY 1 - TMF Beach 🌴 Saturday, July 19, 2025 12PM - 8PM $120.00 BBD\n\nPurchase online 🌐 link in bio or at these official Box Offices:  
• Sole Addiction - Broadstreet, Bridgetown  
• Forever Blessed - Tudor Street, Bridgetown  
• Intermixz - Sky Mall and Sheraton Mall  
• Supernova - Sheraton Mall  
• 11th Street Boutique - Donn Mall  
• DSK Clothing Wear - Kensington Mall  
• Day and Night Boutique - The Walk, Welches  
• Backyaad Restaurant - Hastings  
• Imart Pharmacy - Six Roads, Lanterns & The Walk, Welches  
• Excuse Me Miss - Roebuck Street, Bridgetown  
• Rubis Coverly  
  
⚠️ TMF WEEKEND PASS (Day 1 + Day 2)  
$265.00 BBD  
  
#TMF2025 #TMFBeach #Day1Loading #TipsyMusicFestival  
#SupportLocal 🇭🇹 #TMFBarbados  
#TipsyMusicFestivalBarbados #TopsyBarbados  
#TwistedEntertainment #TwistedBarbados #TwistedFam  
#Barbados #Cropover #GetYourTickets  
  
Edited - 1d  
Likes Liked by jusjayking and 264 others  
1 day ago  
Add a comment... Post"}  
13
```

# YuhHearDem

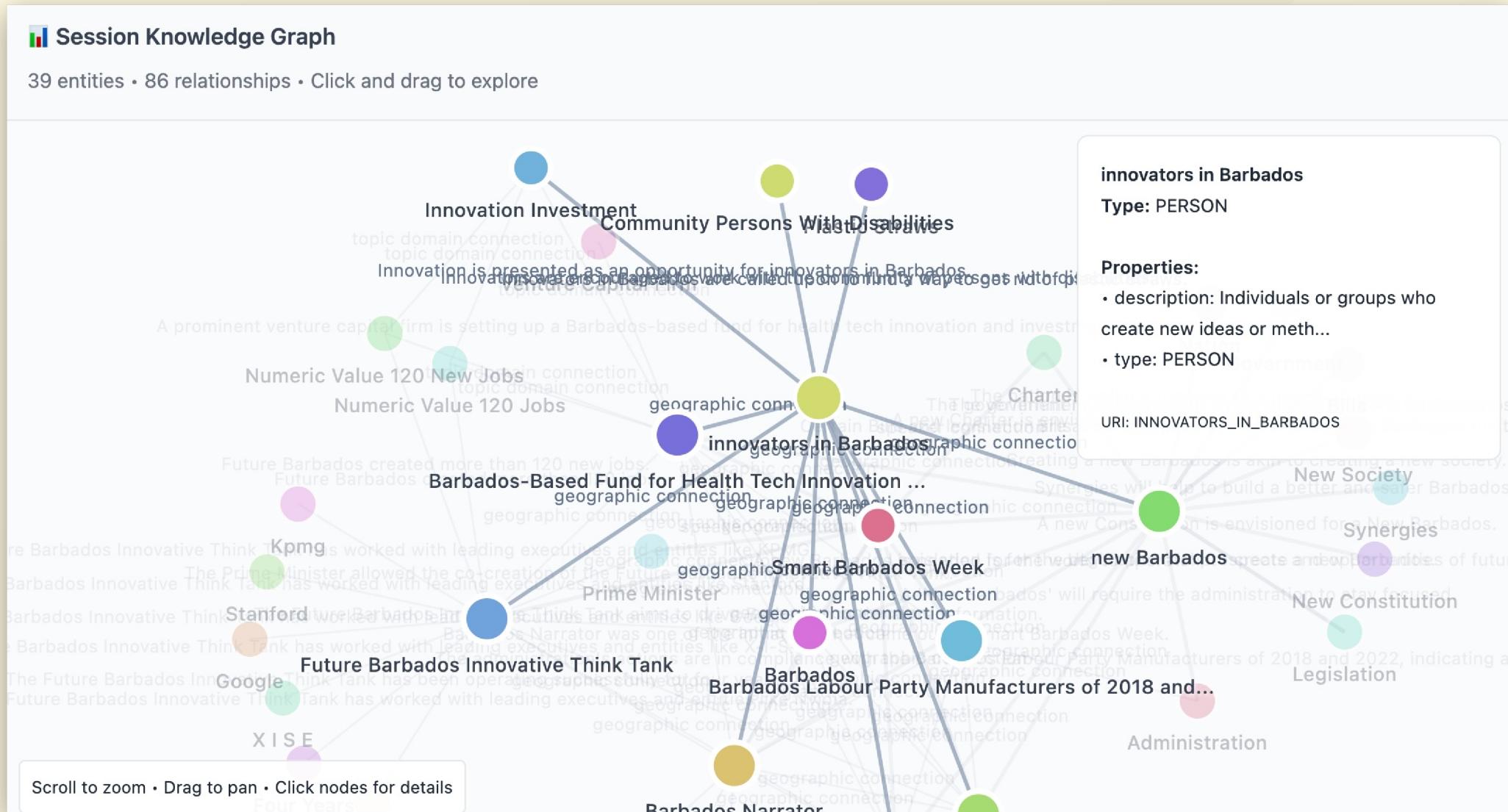
**Problem:** Parliament transcripts are unreadable

**Solution:** AI makes them searchable & structured

- Gemini + LangChain + MongoDB
- Topic segmentation
- Queryable public record
- Links to YouTube videos

The screenshot shows a conversational interface for the YuhHearDem AI. At the top, it says "YuhHearDem" and "No more long talk - get straight to what dey really say". There are buttons for "Connected" and "Clear Chat". Below this, a section titled "Ask About Barbadian Politics" contains a message from the AI: "Hey! I'm YuhHearDem 🇧🇧 Your AI guide to what's happening in Barbados' Parliament. From debates to decisions, I'm here to help you stay informed and involved. Ask me anything — it's your right to know!" It also lists examples: "What did the Minister of Health say about COVID-19?" and "Recent discussions about water management". A row of buttons includes "Healthcare Policy" (blue), "Water Management" (green), "Tourism Development" (orange), "Economic Reform" (purple), and "Recent Debates" (dark blue). The main conversation area shows a user asking "What has been discussed recently about innovation in Barbados?" at 23:19:53. The AI responds with "Alright, I found some recent discussions about innovation in Barbados for ya!". It then provides a summary: "A new Barbados-based fund for health tech innovation and investment was discussed in March 2025." It links to a video clip from the Senate session on Tuesday, March 18, 2025, with the caption: "During the Senate session on **Tuesday, March 18, 2025**, there was a discussion about a significant development in the health sector. *'A prominent venture capital firm is setting up a **Barbados-based fund for health tech innovation and investment**.' - The Honourable* [redacted] *The Senate - Tuesday 18th March 2025 - Part 1* [View discussion on Health Tech Fund](#) [camera icon]".

## Leverage AI Tools to Accelerate Learning in Data Science



# ASIMOV Protocol

**Problem:** LLMs hallucinate & forget

**Solution:** Knowledge graphs for verifiable memory

- Structured data → trusted reasoning
- Knowledge graphs + LLMs = Neurosymbolic AI
- Built by a global team (incl. Barbados)

The screenshot shows the ASIMOV Platform website. At the top right, there are links for 'Modules', 'Platform', and 'Docs', along with social media icons for GitHub (227), LinkedIn (54), and LinkedIn (2.3K). A callout bubble says 'Not just data access'. The main heading is 'Trusted knowledge at scale'. Below it, a paragraph states: 'ASIMOV Platform provides powerful tools to interact with verified, trustworthy data from the ASIMOV Protocol ecosystem. Scrape, process, and integrate trusted knowledge into your applications with confidence.' Three bullet points describe features: 'Verified Sources' (Access only trusted, protocol-verified knowledge sources), 'Trust Scoring' (Built-in trust metrics ensure data quality and reliability), and 'Protocol Integration' (Seamless integration with ASIMOV Protocol infrastructure). A code snippet shows the command '\$ pip install -U langchain-asimov'. At the bottom, there's a code editor with a snippet: '# loading X (Twitter) Profiles from langchain\_asimov import AsimovLoader profiles = AsimovLoader()'.

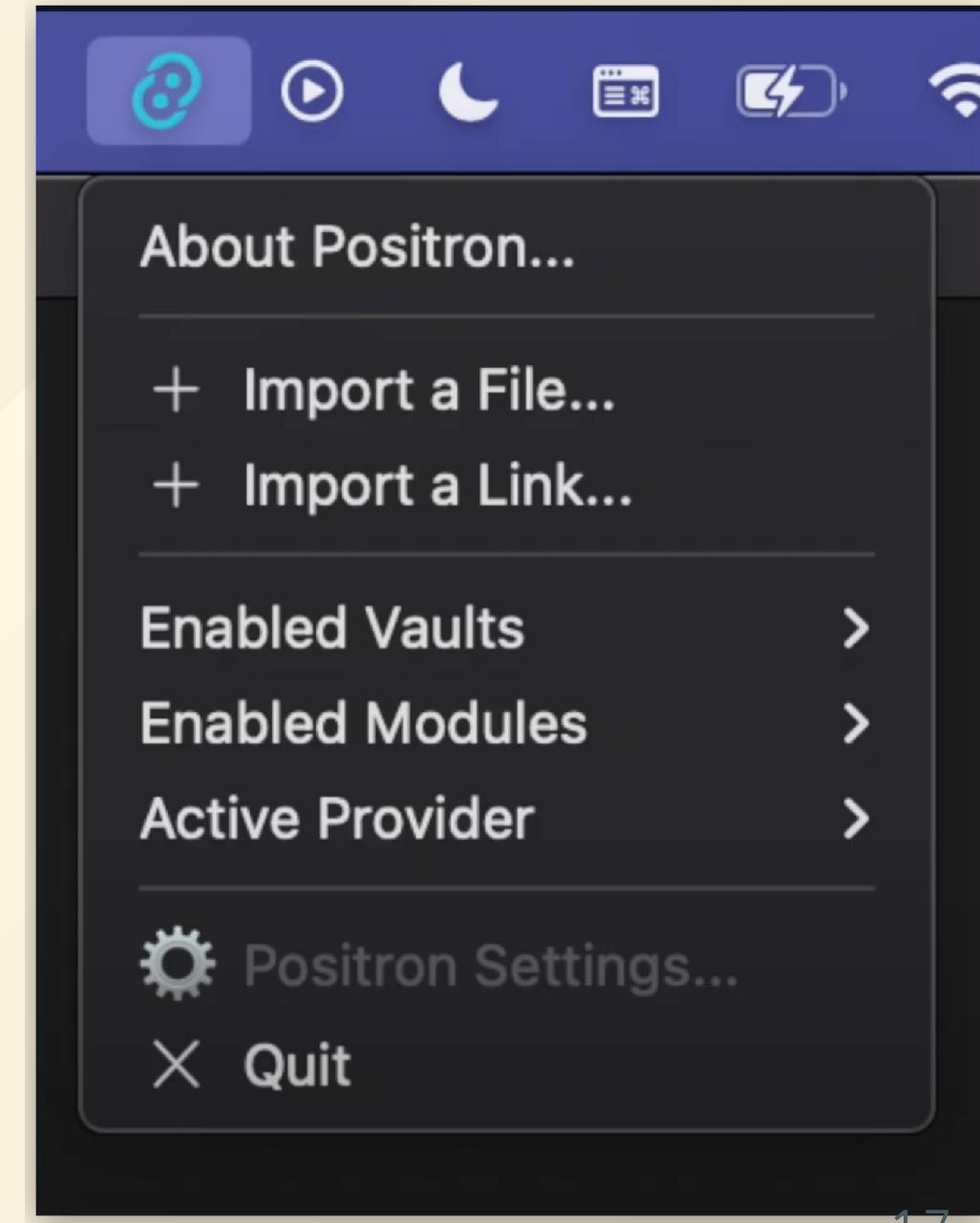
# Positron

**Problem:** Too many notes, no connections

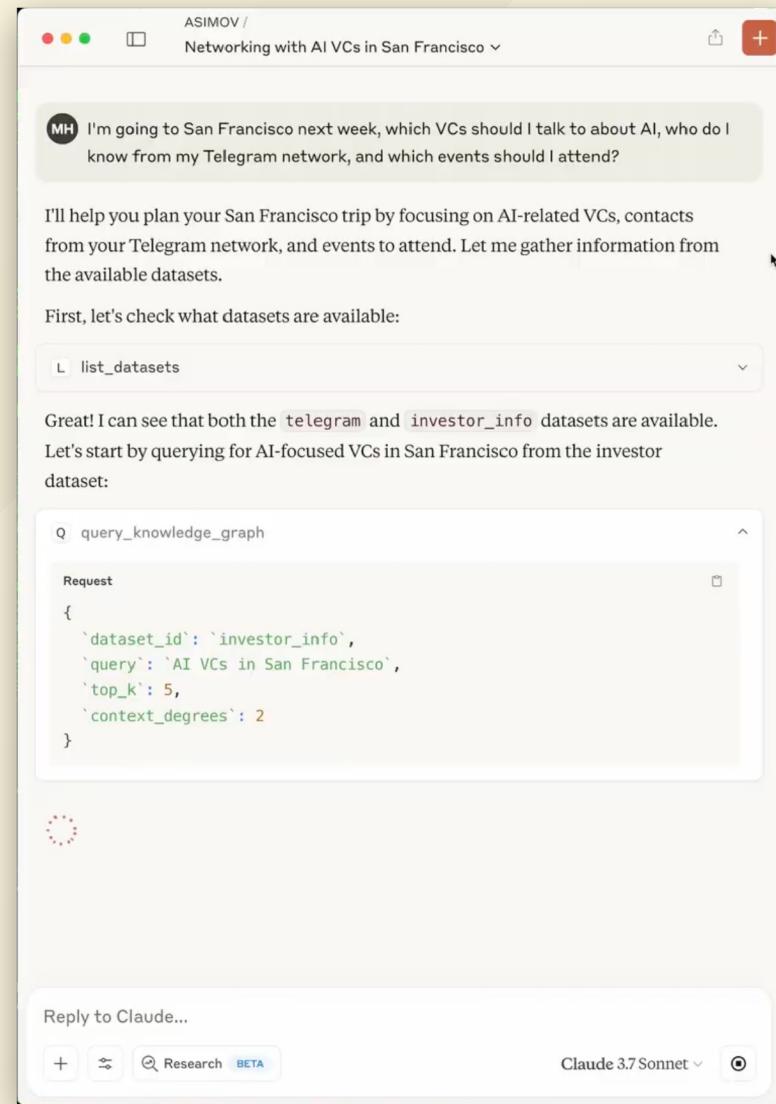
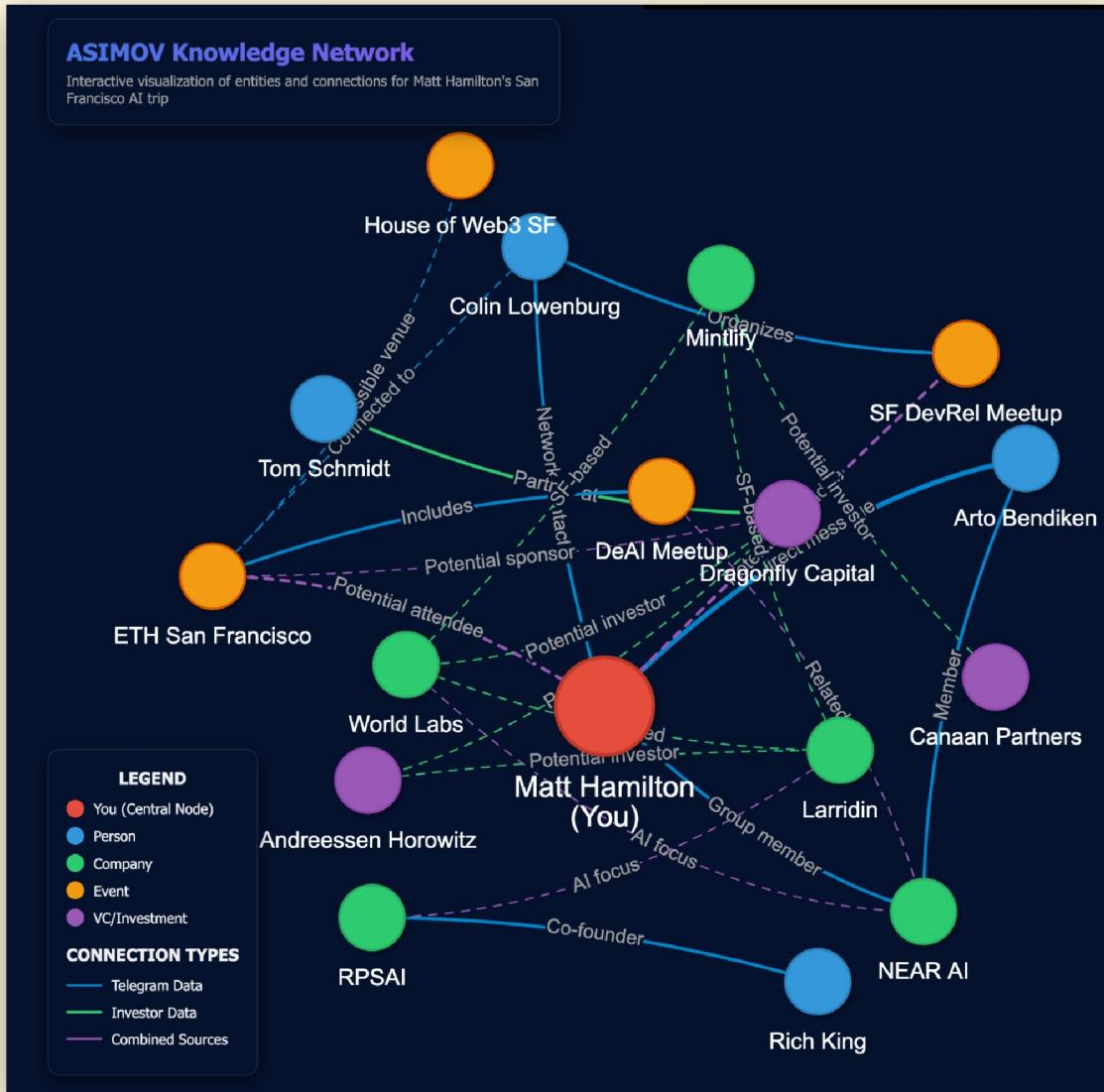
**Solution:** AI that remembers what you learn

- Upload notes, docs, transcripts
- Ask smart, cross-topic questions

“ Who do I know in Barbados who works in AI? ”



# Leverage AI Tools to Accelerate Learning in Data Science



# Core Patterns

-  Structured data > clever prompts
-  Solve real problems
-  Local context = innovation edge
-  Constraints drive creativity

# Prompting Skills

*Talk to AI like an engineer, not just a user*

# Prompting Techniques

-  Be specific
-  Give format/output type
-  Use examples
-  Refine iteratively
-  Ask the LLM itself to improve a prompt!
  
-  Try:

“ “Summarise this for a teenager from Barbados in 3 bullet points with 1 quote.” ”

# Prompt Evolution Example

-  “Explain machine learning”
-  “Explain ML to a 16-year-old in Barbados with a mango analogy”
-  “Keep it under 150 words. Use bullets.”

# Leverage AI Tools to Accelerate Learning in Data Science

```
# Build pre-screening prompt
prompt = f"""Analyze this Instagram post caption to determine if it's likely about an entertainment event in Barbados.

Caption: {caption_text}
Instagram Location Tag: {location_data or 'Not specified'}{past_events_context}

Look for:
- Event keywords: party, fete, lime, concert, cruise, brunch, jouvert, soca, dancehall, festival
- Location indicators: Barbados, Bajan, specific Barbados venues
- Artist/DJ names, dates, times
- Ticket/entry information
- Language: Is the main text in English? (Events in Barbados are typically in English)
- DATE INFORMATION: Specific dates, days of week, times (e.g., "Friday Dec 25", "tonight", "this Saturday", "8pm")

Return ONLY this JSON:
{{
    "confidence": 0-100 (how confident this is about a Barbados event),
    "reasoning": "Brief explanation of your confidence score"
}}


Important:
- If location tag shows a different country, max confidence should be 30
- If no event-related keywords found, confidence should be very low
- Personal photos, general posts, or past event recaps should have low confidence
- If it mentions soca, music, vibes, artists, or entertainment then score it higher
- If the main text/description is primarily in a language other than English (e.g., French, Spanish, Portuguese, Dutch),
- Short promotional text with just artist names or basic info can be multilingual, but detailed descriptions should be in
- You cannot assume an event date from the post date alone. Just saying "live" is not sufficient - there must be specific
```

# Prompting Challenge

*Let's see how well you can talk to an AI!*

# Clean the Data!

## Dataset Issues:

-  Mixed date formats
-  Inconsistent phone numbers
-  Location variations
-  Missing values
-  Invalid entries

**Goal:** Write the best prompt to clean it all.

# Rules & Scoring

-  30 minutes
-  Unlimited submissions
-  Gemini 2.5 Pro will score
-  Best score wins!

**Scoring metrics:** Formatting, completeness, accuracy, structure

**bit.ly/bim-ai-workshop**

**Wifi: Pelican House**

**Password: Pelicanestate01!**

# Context Engineering

*What the model knows when you prompt it.*

# What is Context Engineering?

"Prompting is what you say – context is what the model knows when you say it."

**Context Engineering** means designing, structuring, and delivering the *right* information to an AI model at the *right* time.

Used to:

- Improve relevance, Reduce hallucination, Handle long documents, Personalize outputs

# Why Context Matters

 LLMs have a messy "knowledge soup" that comes from their training by default.

They can't reason over information they haven't seen or can't access.

- If context is **messy, outdated, or too long**, results suffer
- If it's **clean, focused, and structured**, you get great output

**Good context = better results**

# Ways to Engineer Context

## Basic methods:

- Paste a doc into the prompt
- Few-shot examples
- System instructions

## Advanced tools:

- RAG (Retrieval-Augmented Generation)
- Knowledge graphs

# Model Context Protocol (MCP)

**MCP** = a structured way to manage what the model sees

- Built at **Anthropic** (the people behind Claude)
- Works across Claude, Gemini, ChatGPT, etc.
- Makes inputs reliable, reusable, and traceable

Think of MCP as “**RAM for AI**” – structured, shared memory for LLMs

# What MCP Enables

-  Plug-and-play context across models
-  Modular memory chunks ("What I know", "Project data")
-  Fewer hallucinations, better personalization

Use cases:

- Learning agents
- Civic transparency tools (YuhHearDem)
- Smart multi-agent workflows

# The AI Toolkit

*Build with what's available today*

# LLMs Compared

Tool	Strengths	Use Case
ChatGPT	Fast, general	Drafting, Q&A
Claude	Long context, code	Docs, debugging
Gemini	Multimodal	Tables, images

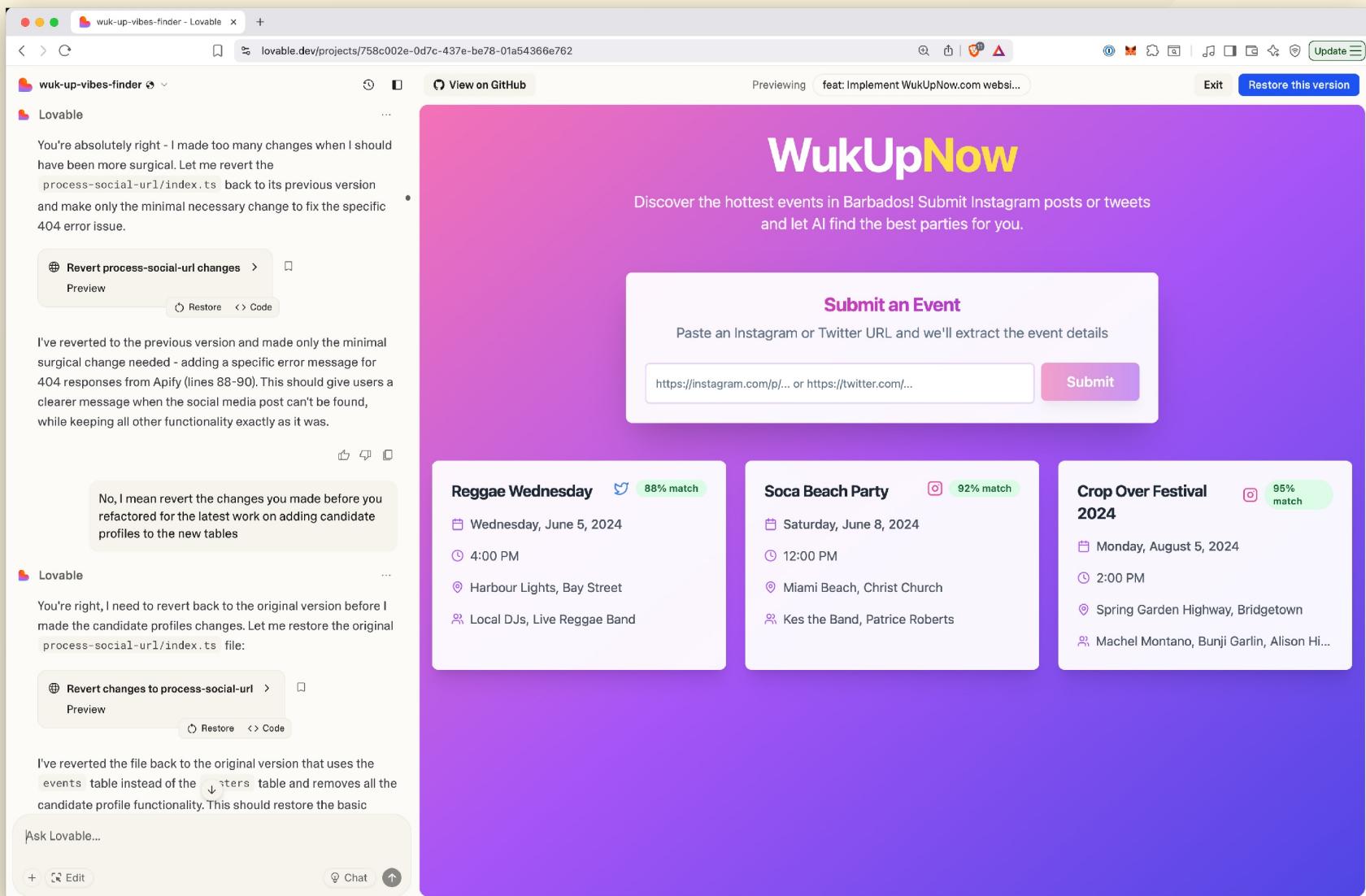
**Tip:** Pick the right tool for the right job

# Coding Agents

- Claude Code
- Cursor
- Lovable.ai
- Bolt.new

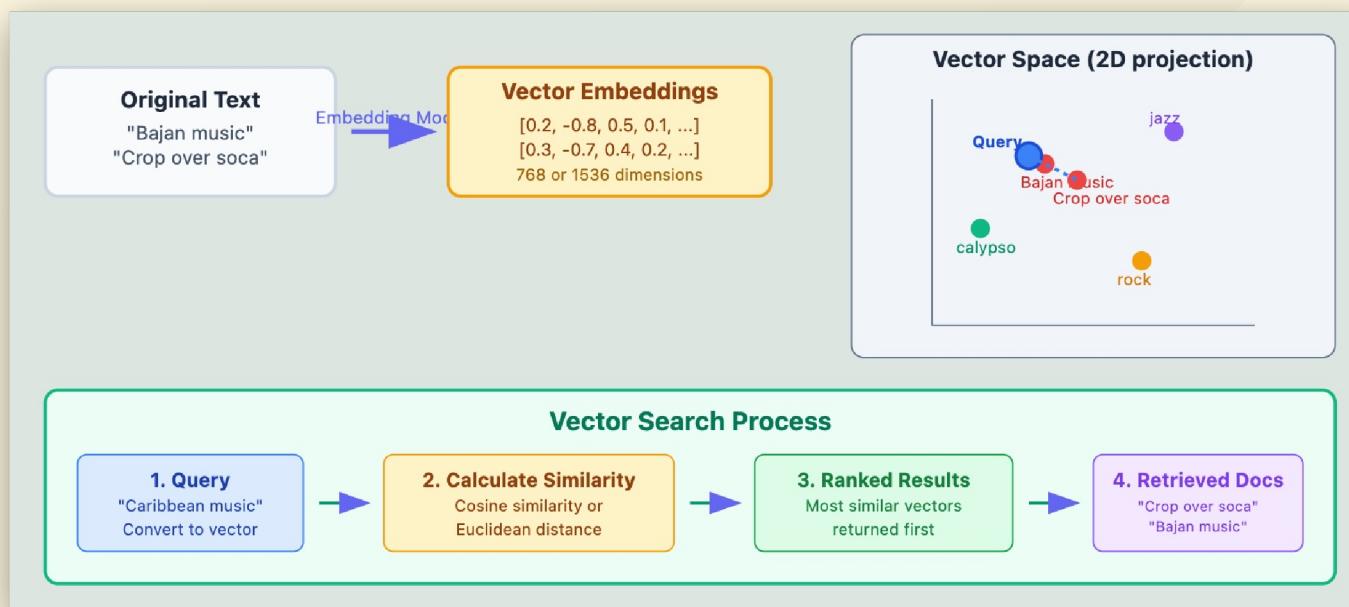
```
rm -rf ai-prompting-competition/.git  
!o content)  
  
git add .)  
!o content)  
  
git status)  
branch main  
  
> commits yet  
< 6 times (ctrl+r to expand)  
  
git commit -m "Initial commit: AI Prompting Workshop materials..."  
!ain (root-commit) c3acbb] Initial commit: AI Prompting Workshop materials  
< files changed, 1096 insertions(+)  
create mode 100644 2-hour-ai-workshop-plan.md  
< 4 lines (ctrl+r to expand)  
  
'll add the remote repository and push to your GitHub:  
  
git remote add origin https://github.com/hammertoe/AIPromptingWorkshop.git  
!o content)  
  
git push -u origin main)  
rror: fatal: could not read Username for 'https://github.com': Device not configured  
  
push failed because we need authentication. Let me try using SSH instead, or you may need to create the repository on GitHub first. Let me  
git remote set-url origin git@github.com:hammertoe/AIPromptingWorkshop.git  
!o content)  
  
git push -u origin main)  
rror: ERROR: Repository not found.  
atal: Could not read from remote repository.  
  
Please make sure you have the correct access rights  
and the repository exists.  
  
repository doesn't exist on GitHub yet. You'll need to create it first. Here are the steps to complete this:  
  
Next Steps to Complete GitHub Setup  
  
Create the repository on GitHub:  
Go to https://github.com/hammertoe  
Click "New repository"  
Name it AIPromptingWorkshop  
Make it public or private as you prefer  
Don't initialize with README, .gitignore, or license (since we already have content)  
Then push the code:  
users/matt/Development/AIPromptingWorkshop  
push -u origin main  
  
That's Ready to Push  
  
repository is already set up locally with:  
Initial commit created with all workshop materials  
AI Prompting Competition platform (with all recent fixes)  
Workshop slides and documentation  
Remote configured to point to your GitHub  
  
you can create the AIPromptingWorkshop repository on GitHub, just run the git push -u origin main command and everything will be uploaded to your GitHub account.  
If you want me to try a different repository name or if you've already created it with a different name, let me know and I can update it.  
try to push the repository now. Let me attempt the push again:  
  
git push -u origin main)  
Branch 'main' set up to track 'origin/main'.  
> https://github.com/hammertoe/AIPromptingWorkshop.git  
(new branch)      main -> main  
  
Successfully pushed to GitHub!  
  
repository has been successfully pushed to https://github.com/hammertoe/AIPromptingWorkshop  
that was pushed:  
  
Prompting Competition platform - Complete Flask application with all fixes  
Workshop slides (Markdown and PowerPoint formats)  
Our workshop plan documentation  
Issues file  
The recent improvements including:  
Rate limiting removed  
Processor deployment fixes  
Cloud Build standardization  
Import error fixes  
  
repository is now live on your GitHub account. You can view it at:  
https://github.com/hammertoe/AIPromptingWorkshop  
  
to-accept edits on (shift+tab to cycle)
```

# Leverage AI Tools to Accelerate Learning in Data Science



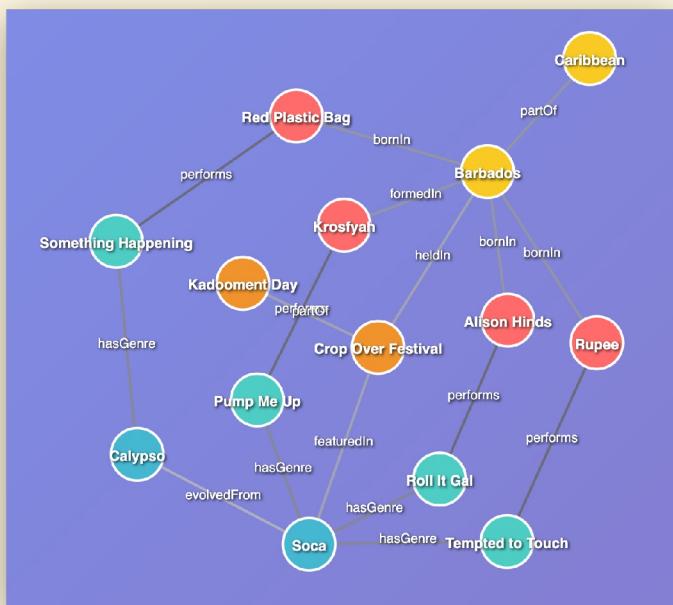
# Embeddings & Search

- Convert text → numbers (vectors)
- Find related concepts, not just keywords



# Knowledge Graphs

- Memory + structure = better answers
- Link facts, concepts, people



```
@prefix music: <http://example.org/music/> .
@prefix foaf: <http://xmlns.com/foaf/0.1/> .
@prefix mo: <http://purl.org/ontology/mo/> .
@prefix geo: <http://www.w3.org/2003/01/geo/wgs84_pos#> .

# Artists
music:alison_hinds a foaf:Person ;
  foaf:name "Alison Hinds" ;
  music:bornIn music:barbados ;
  mo:performer music:roll_it_gal .

music:rupee a foaf:Person ;
  foaf:name "Rupee" ;
  music:bornIn music:barbados ;
  mo:performer music:tempted_to_touch .

music:krosfyah a mo:MusicGroup ;
  foaf:name "Krosfyah" ;
  music:formedIn music:barbados ;
  mo:performer music:pump_me_up .

music:red_plastic_bag a foaf:Person ;
  foaf:name "Red Plastic Bag" ;
  music:bornIn music:barbados ;
  mo:performer music:something_happening .

# Songs
music:roll_it_gal a mo:Track ;
  mo:title "Roll It Gal" ;
  mo:genre music:soca .
```

# Careers & Action

*How to build your future with AI*

# Build Your Portfolio

-  3-5 real projects on GitHub
-  Blog what you learn
-  Join communities
-  Work remote from Bim

# Final Takeaways

-  Constraints are assets
-  Local ideas can go global
-  You don't need permission
-  Start building this week

# Your Turn

"The AI revolution is being written in Bridgetown."



What will you build?

Q & A