

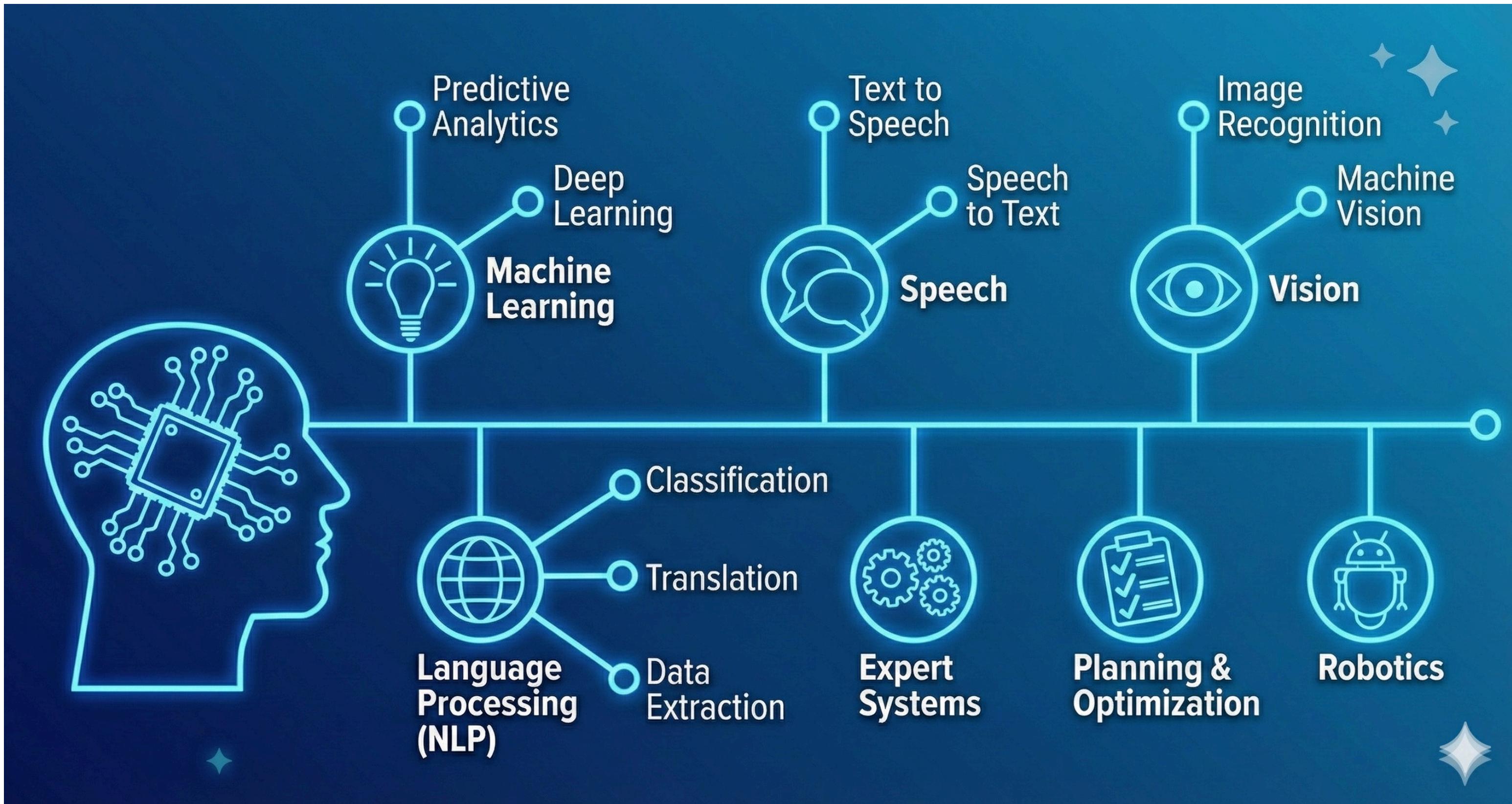
Data Science, AI, and Machine Learning in Public Health using R

Day 1 Recap

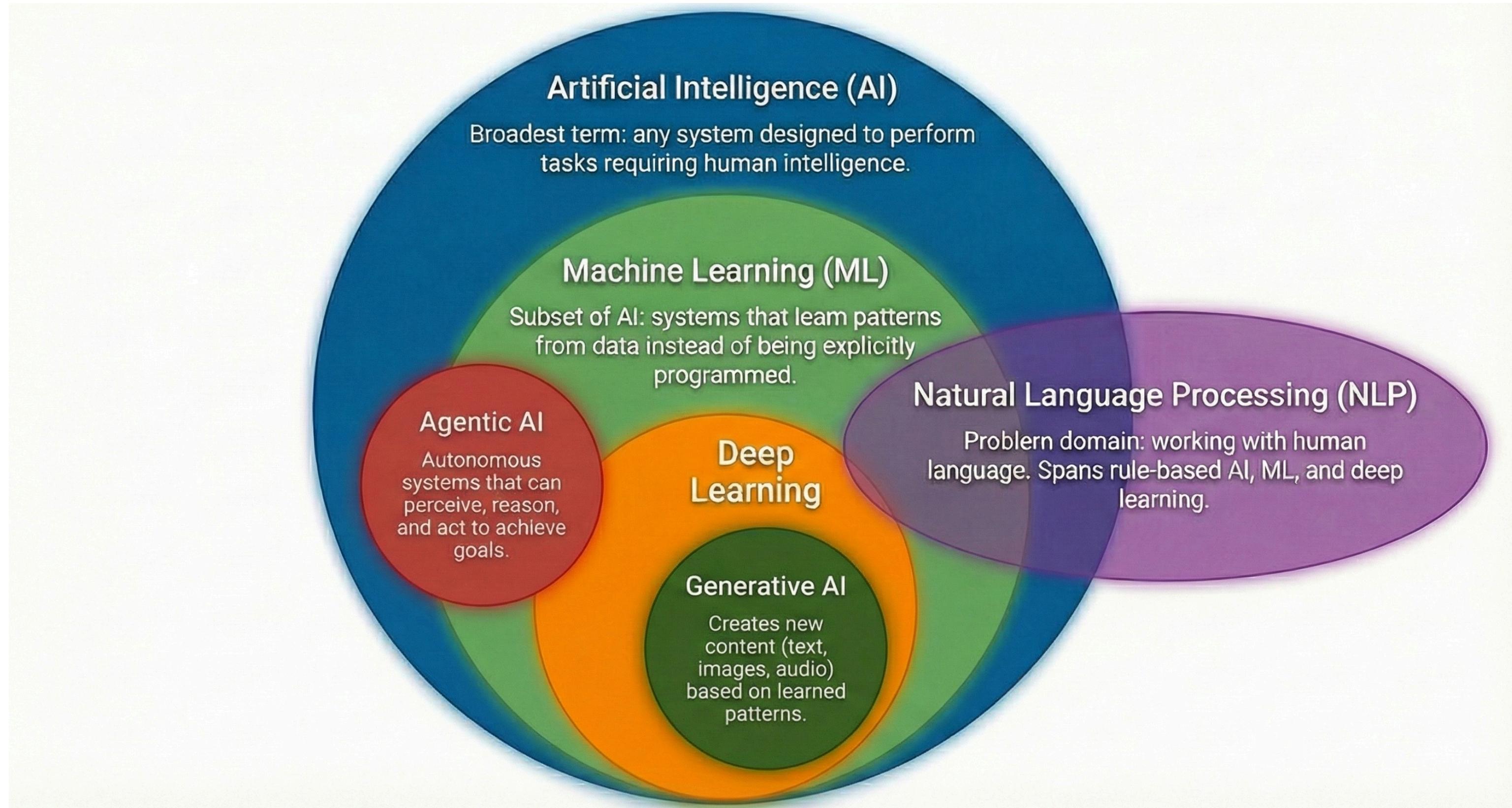
January 2026

Presented By: Wronski Associates

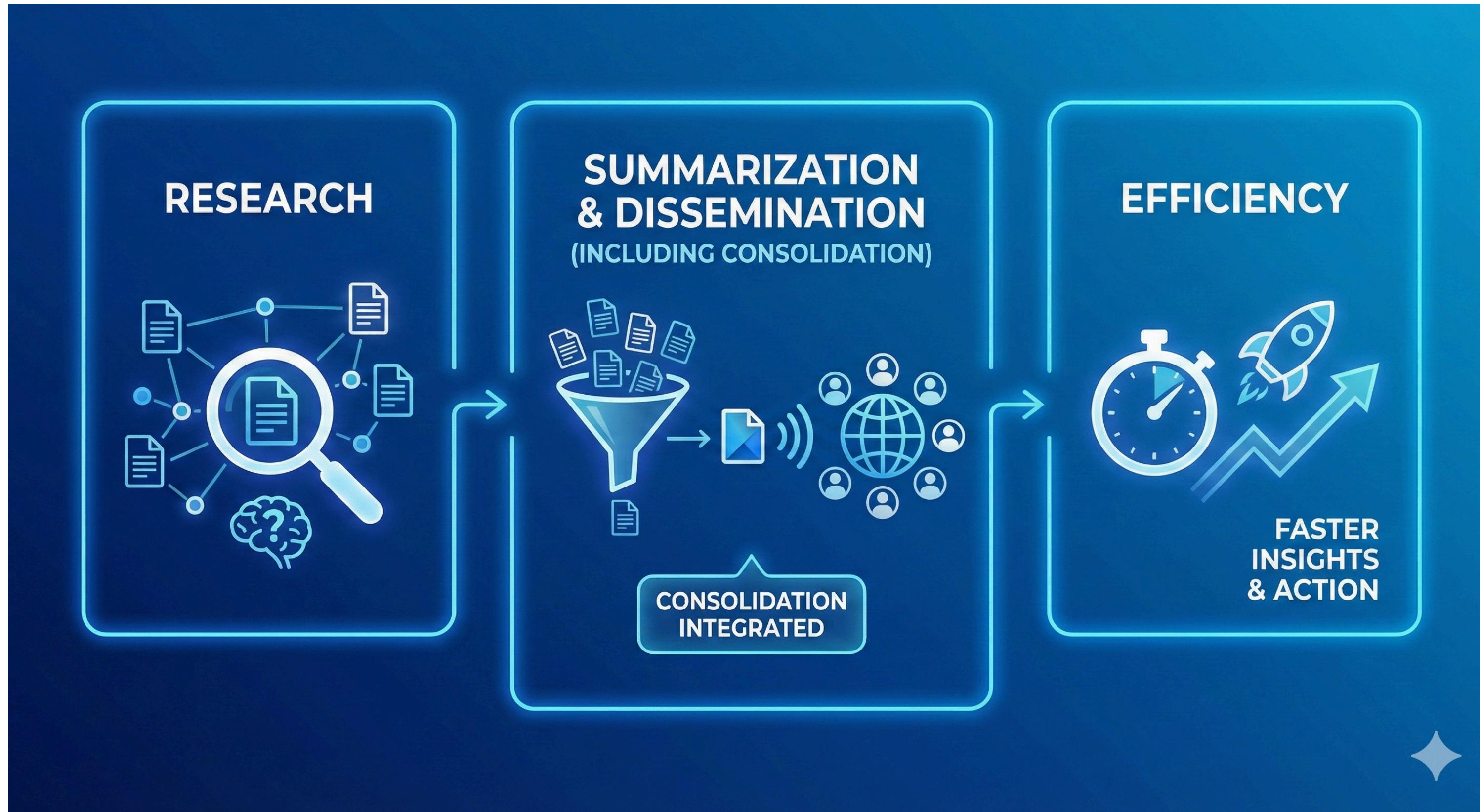
Historical AI



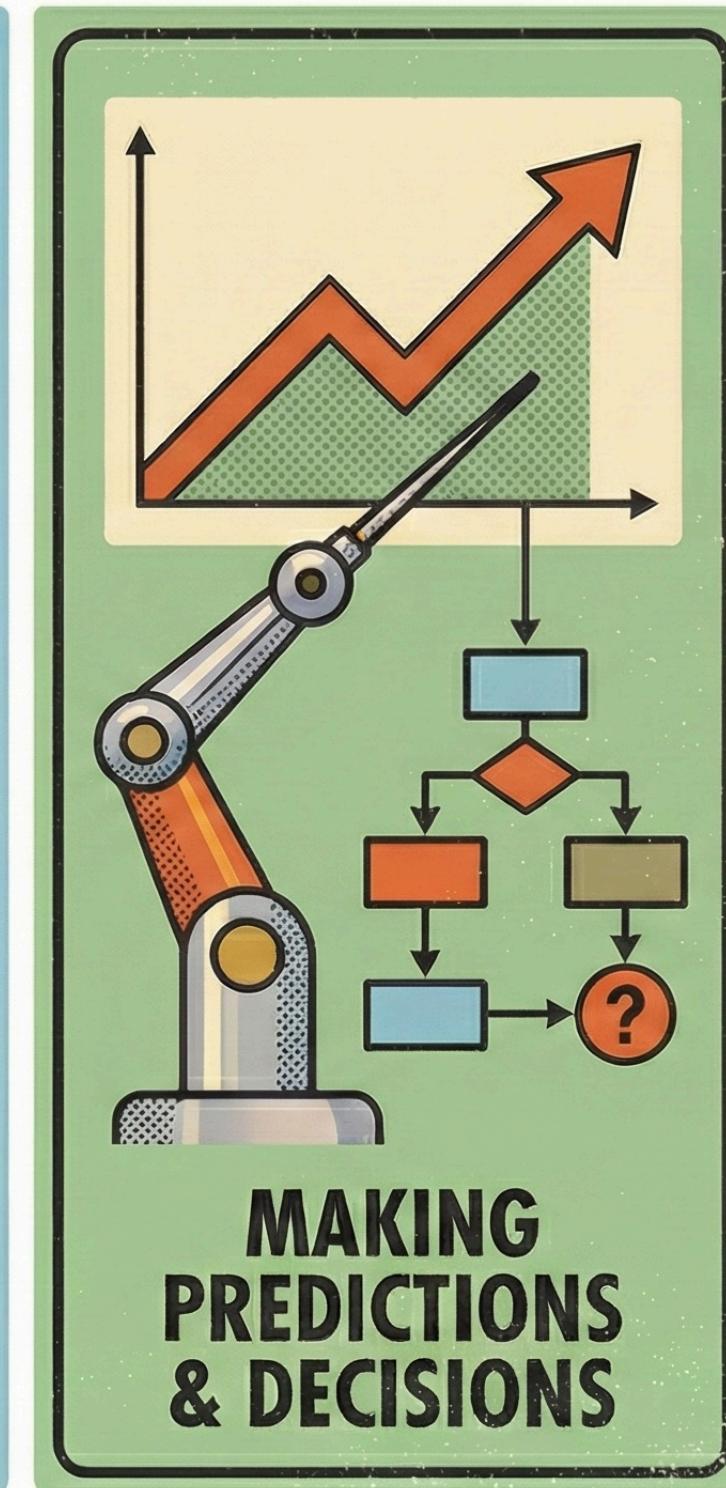
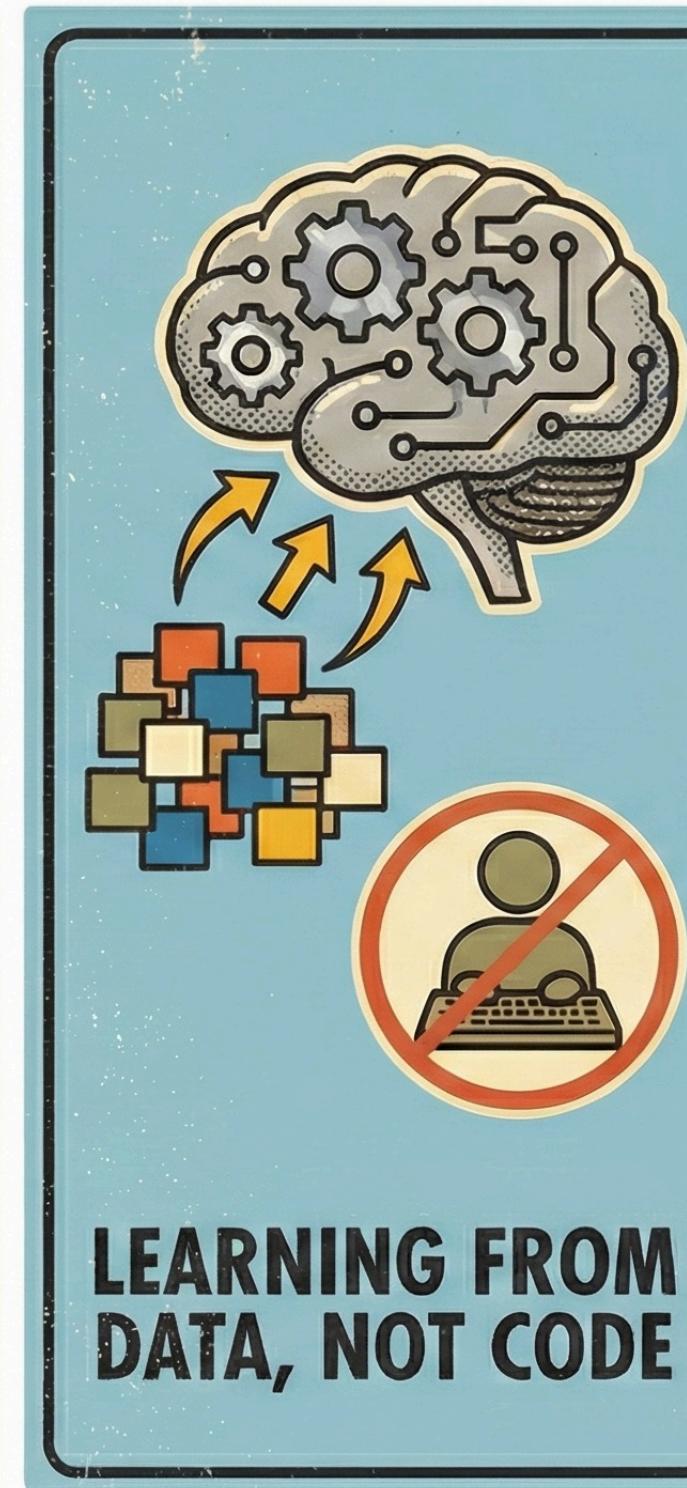
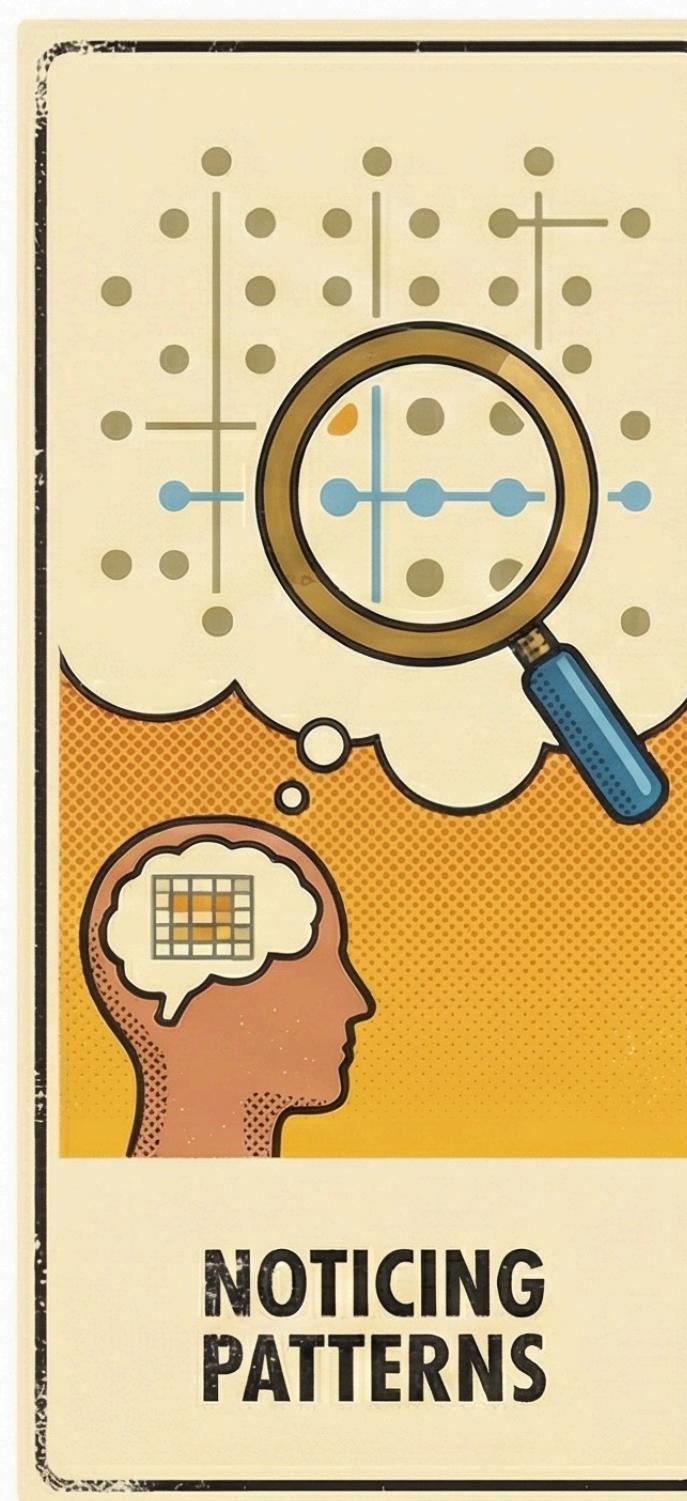
Modern AI - major subfields



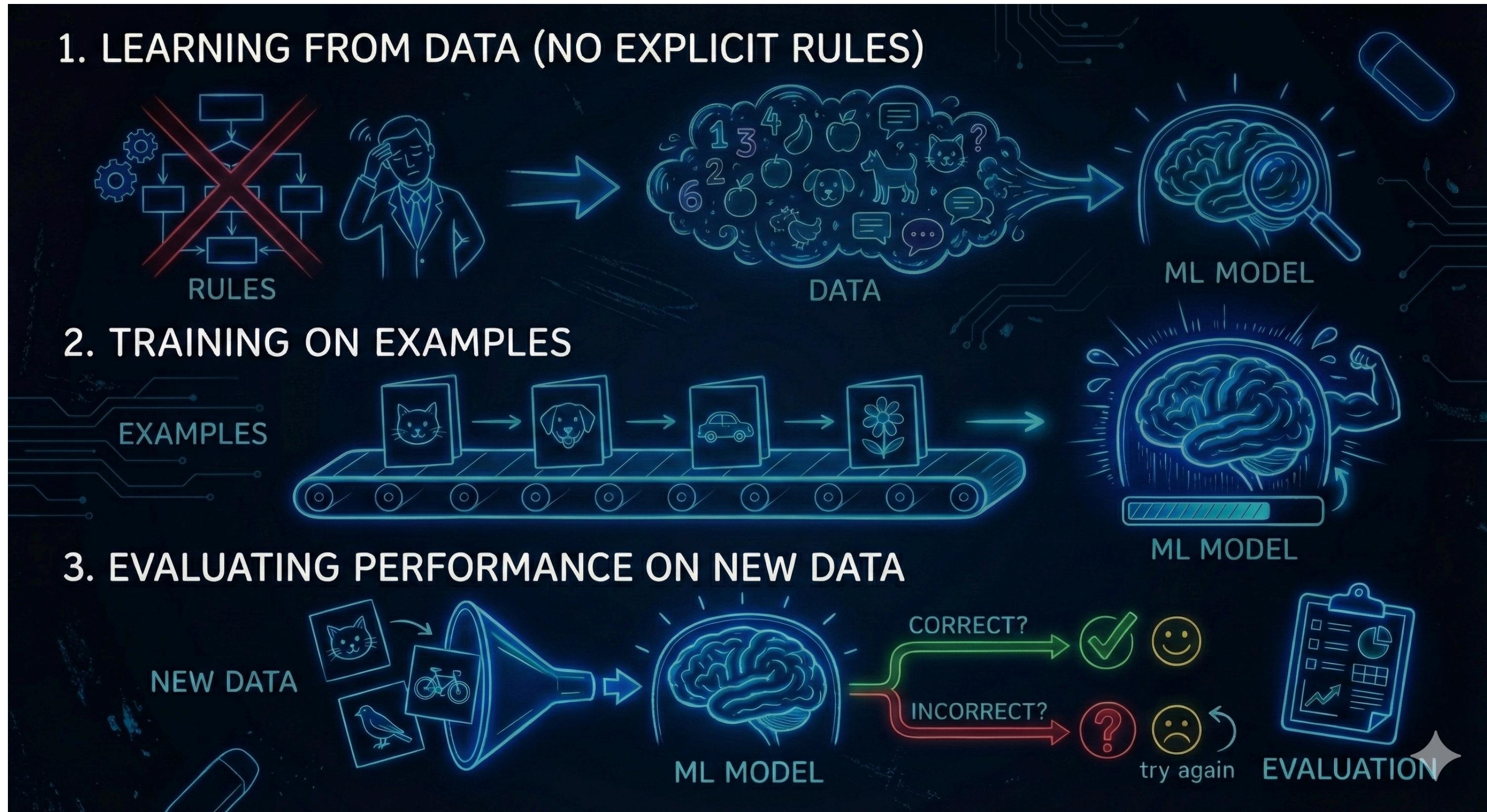
Organizing AI by Use



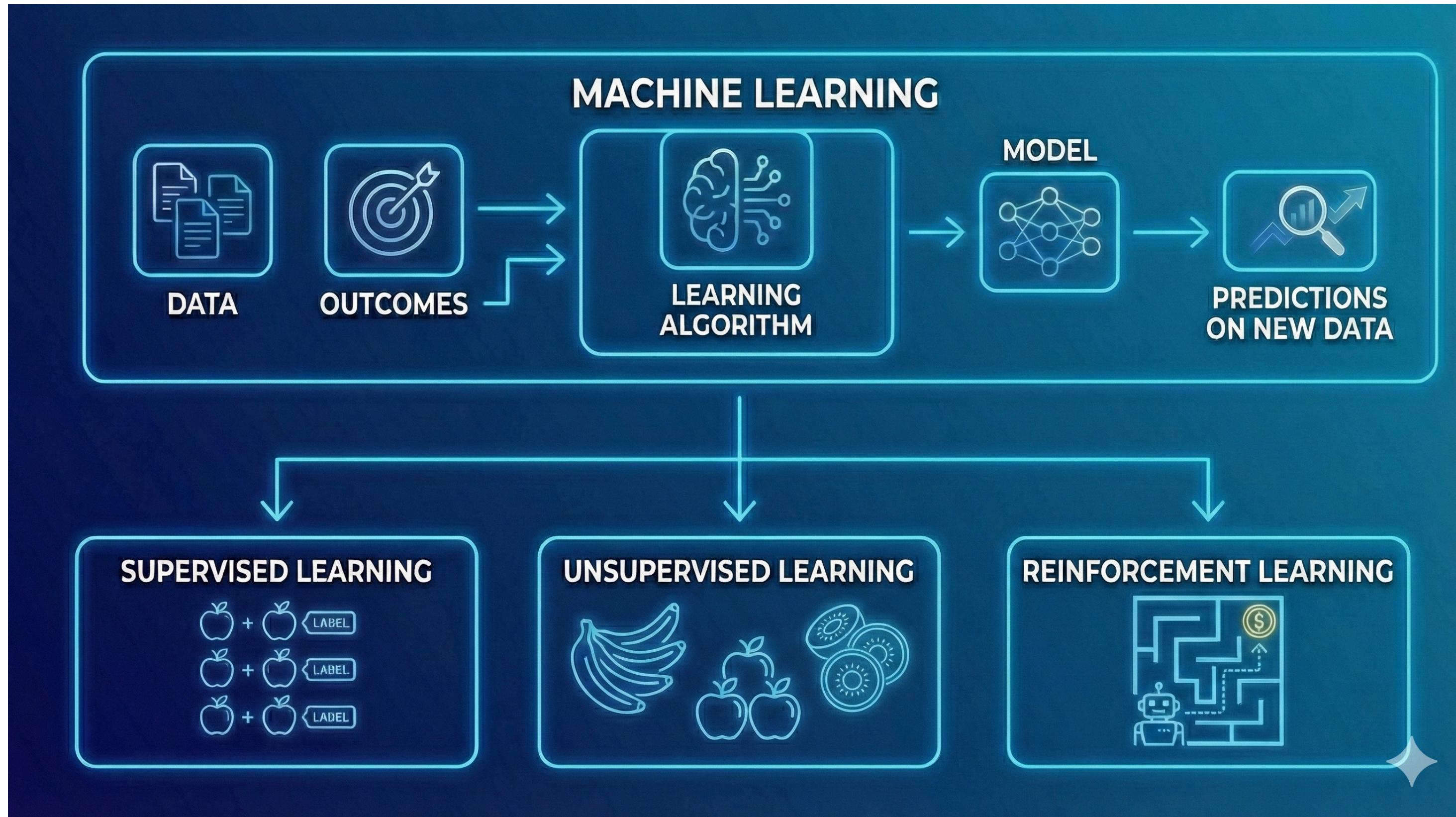
The key idea: AI is not one thing; it is a collection of methods that let computers:



Machine Learning Core Concepts



ML Learning Paradigms



Foundation exercises

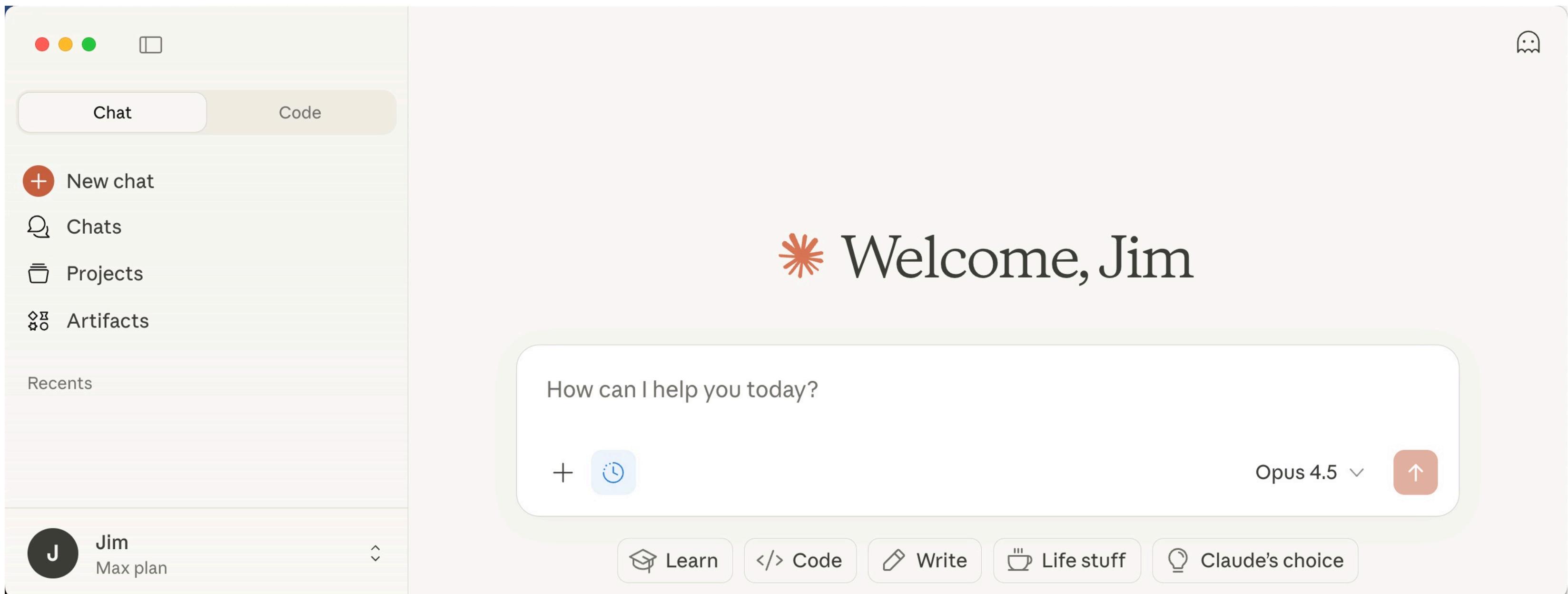
Topic 1: Was AI used to build the model that performs the task?

1. A system that analyzes chest X-rays to flag potential tuberculosis cases for radiologist review.
2. An eligibility determination system that checks if an applicant's income is below 138% of the federal poverty level and they reside in the state.

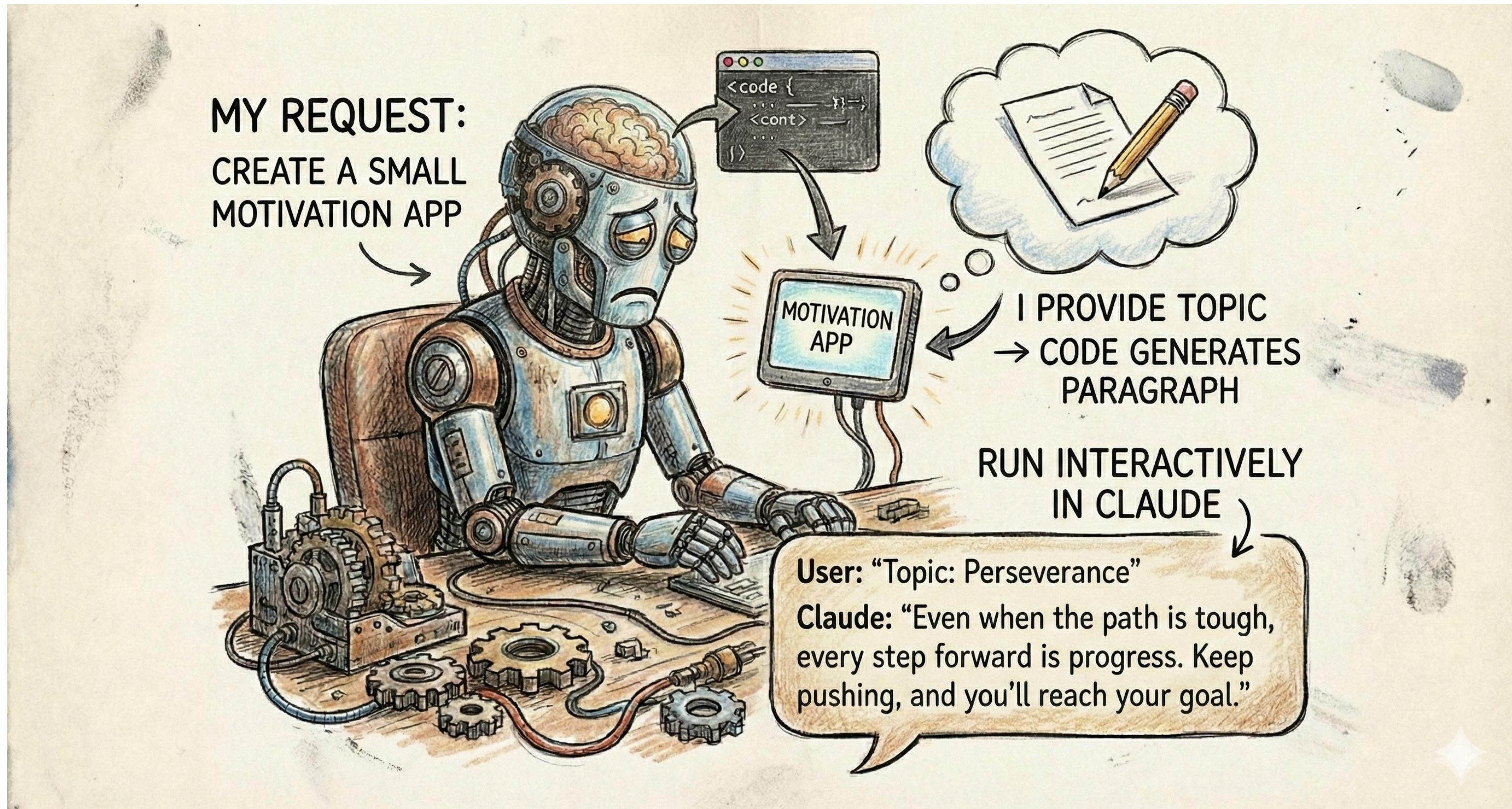
Topic 2: What ML learning paradigm was used?

1. Predict which pregnant women enrolled in Medicaid are at high risk for preterm delivery so care coordinators can provide additional support.
2. Analyze emergency department visit data to discover natural groupings of patients with similar symptoms, demographics, and utilization patterns—without predefined categories.

Claude HHS walkthrough



Motivation app



Prompt 1 - Getting started

Prompt

I need some motivation.

Devised warm, conversational encouragement for motivation request. ▼

I've got you.

Here's the thing: the fact that you're asking for motivation means something in you is still fighting, still reaching. That spark matters more than you might realize right now.

Whatever you're facing—whether it's a project that feels too big, a goal that seems far off, or just getting through the day—remember that progress doesn't have to be dramatic to be real. Small steps still move you forward. Showing up, even when it's hard, is an act of courage.

You don't have to feel motivated to take action. Sometimes action is what creates the motivation. Start with one thing. Just one. The momentum will follow.

What's weighing on you? I'm happy to get more specific if you want to talk through it.

Prompt 2

Prompt

How about asking me for a topic?

Fair point—I jumped ahead. What do you need motivation for?

waking up.

That's one of the hardest ones—because it's not just physical, it's the question underneath: *what am I getting up for?*

A few thoughts:

If it's about the morning battle itself: Your brain lies to you at 6 a.m. It says the bed is the only good thing and the day has nothing for you. It's wrong. The day hasn't even had a chance yet. Sometimes the win is just feet on the floor. That's it. Everything else comes after.

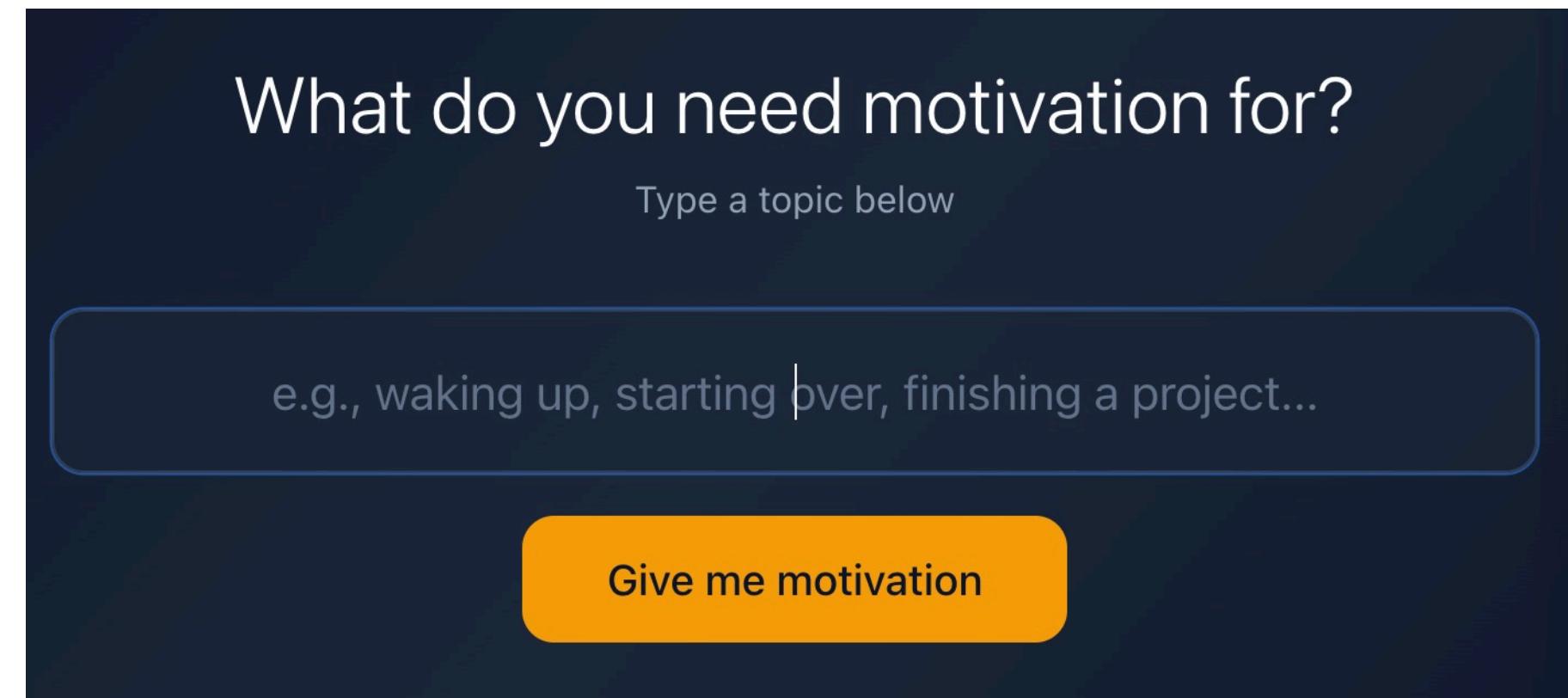
If it's something deeper: Not every day has to have a grand purpose waiting. Sometimes you wake up for small things—coffee, sunlight, curiosity about what might happen, a song you like, someone who'd notice if you weren't there. Those count. They're not small at all, actually.

Which side of it are you feeling?

Prompt 3

Prompt

Create an interface that will run within this chat. It should prompt me for a topic and respond with a 5-6 line motivational statement



Prompt 4

Prompt

You decide.

- Modify your motivation app. Give Claude instructions to shorten or lengthen the response, change the tone of the response, change colors, etc.

What do you need a little snarky motivation for?

Type a topic below

e.g., waking up, starting over, finishing a project...

Give me motivation

posit.cloud setup

The screenshot displays the posit.cloud RStudio interface, which is a cloud-based R development environment. The interface includes a navigation sidebar on the left and various toolbars and panes on the right.

Scripting area: The main workspace where code is written. It shows a single file named "Untitled1" with the number "1" in it.

Console: A pane at the bottom left showing the R command line interface. It displays the prompt "R 4.5.2 > /cloud/project/".

Environment & history: A large pane on the right containing tabs for Environment, History, Connections, and Tutorial. The Environment tab is active, showing the Global Environment with an R object named "117 MiB".

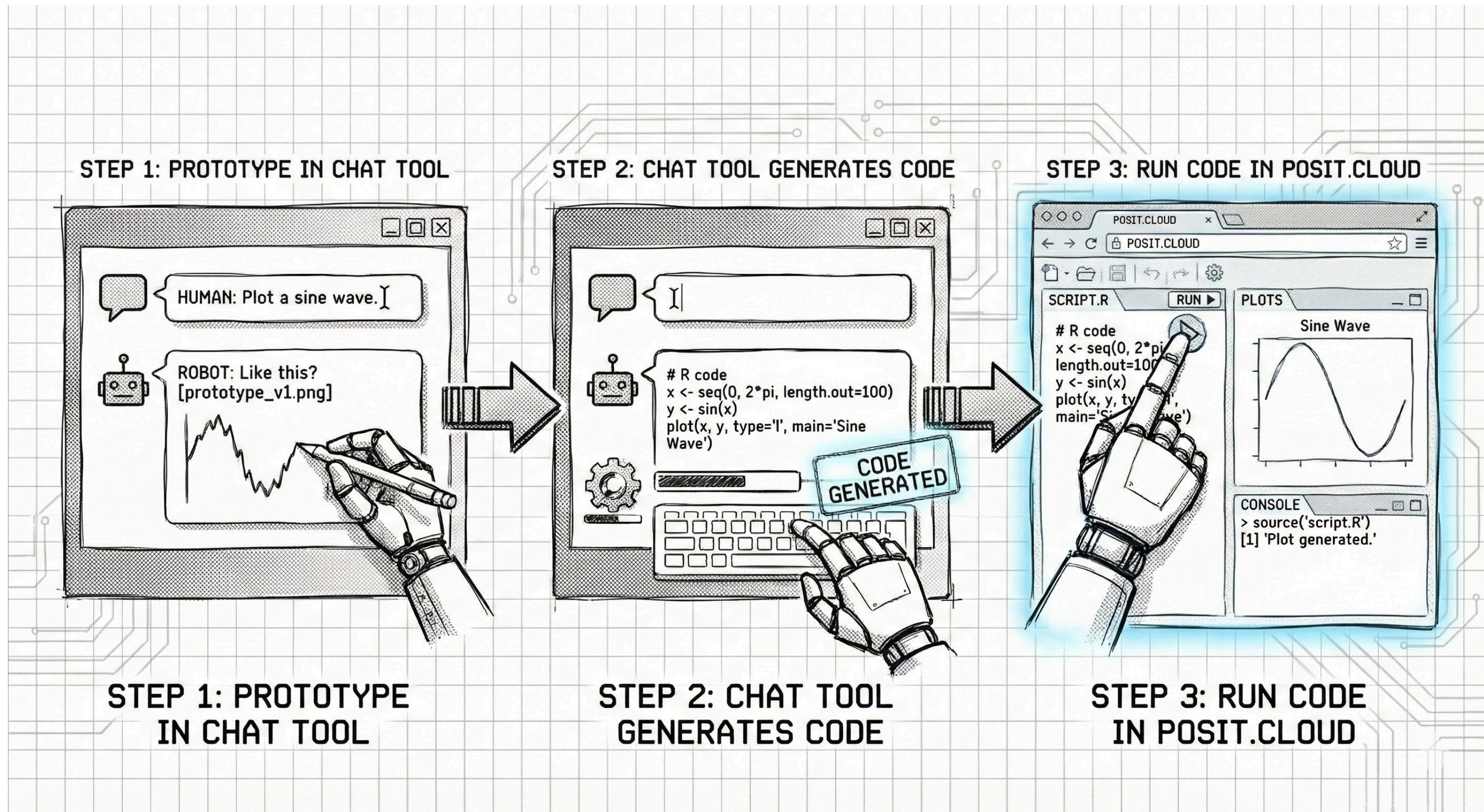
Files available: A file browser pane showing the contents of the current project. It lists three files: ".Rhistory" (0 B, Dec 29, 2025, 3:28 PM), "project.Rproj" (205 B, Dec 29, 2025, 3:28 PM), and "math-backup.R" (287 B, Dec 29, 2025, 3:30 PM).

Navigation sidebar: Includes links for Spaces (Your Workspace, Clone_Test, New Space), Learn (Guide, What's New, Recipes, Cheatsheets), Help (Current System Status, Posit Community), and Info (Plans & Pricing, Terms and Conditions).

Toolbar: Located at the top of the main workspace, it includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, Help, and Addins menus. It also shows RAM usage, system settings, and user information (Jim Cody - UMass).

Address bar: Shows the URL "posit.cloud/content/11656134".

From Chat to Code



**STEP 1: PROTOTYPE
IN CHAT TOOL**

**STEP 2: CHAT TOOL
GENERATES CODE**

**STEP 3: RUN CODE
IN POSIT.CLOUD**

Prototype - This is the prompt we will use

Below, there are 15 rows of data. Create a dataset overview and calculate the mean, min and max for each of the following numeric values - time in hospital, num lab procedures, num procedures and num medications. Display the resulting table in this chat.

```
encounter_id apatient_nbr race gender age time_in_hospital num_lab_procedures num_procedures num_medications diag_1 diag_2  
diag_3 A1Cresult insulin diabetesMed readmitted 2278392 8222157 Caucasian Female [0-10) 1 41 0 1 250.83 ?? None No No NO  
149190 55629189 Caucasian Female [10-20) 3 59 0 18 276 250.01 255 None Up Yes >30 64410 86047875 AfricanAmerican Female  
[20-30) 2 11 5 13 648 250 V27 None No Yes NO 500364 82442376 Caucasian Male [30-40) 2 44 1 16 8 250.43 403 None Up Yes NO  
16680 42519267 Caucasian Male [40-50) 1 51 0 8 197 157 250 None Steady Yes NO 35754 82637451 Caucasian Male [50-60) 3 31 6  
16 414 411 250 None Steady Yes >30 55842 84259809 Caucasian Male [60-70) 4 70 1 21 414 411 V45 None Steady Yes NO 63768  
114882984 Caucasian Male [70-80) 5 73 0 12 428 492 250 None No Yes >30 12522 48330783 Caucasian Female [80-90) 13 68 2 28  
398 427 38 None Steady Yes NO 15738 63555939 Caucasian Female [90-100) 12 33 3 18 434 198 486 None Steady Yes NO 28236  
89869032 AfricanAmerican Female [40-50) 9 47 2 17 250.7 403 996 None Steady Yes >30 36900 77391171 AfricanAmerican Male  
[60-70) 7 62 0 11 157 288 197 None Steady Yes <30 40926 85504905 Caucasian Female [40-50) 7 60 0 15 428 250.43 250.6 None  
Down Yes <30 42570 77586282 Caucasian Male [80-90) 10 55 1 31 428 411 427 None Steady Yes NO 62256 49726791  
AfricanAmerican Female [60-70) 1 49 5 2 518 998 627 None Steady Yes >30
```

Verify understanding

Before generating code, tell me what the requirements are. I want R code to recreate the dataset overview and summary statistics from above. Instead of using the sample data, use this url as a data source -

https://raw.githubusercontent.com/jmcody2014/BA/refs/heads/main/diabetic_data50K.csv

Generate code

Do not try to run it internally. Generate the code and I will copy/paste into posit.cloud. Generate the R code.

1. Start posit.cloud
2. File → New → R Script
3. Paste the code from Claude
4. File → Save As → 'diabetes-summary-22'
5. Pres **Source** and the code should run cleanly.

Using machine learning

1. Start a new chat
2. Enter this prompt
 - a. Below are 15 rows of sample data. Using this data as a sample, give me three options to predict readmission.

encounter_id	apatient_nbr	race	gender	age	time_in_hospital	num_lab_procedures	num_procedures	num_medications	diag_1	diag_2	diag_3	A1Cresult	insulin	diabetesMed	readmitted				
2278392	8222157	Caucasian	Female [0-10)	1	41	0	1	250.83	?	?	None	No	No	NO	149190	55629189	Caucasian Female [10-20)		
3	59	0	18	276	250.01	255	None	Up	Yes	>30	64410	86047875	AfricanAmerican	Female [20-30)	2	11	5	13	
648	250	V27	None	No	Yes	NO	500364	82442376	Caucasian	Male [30-40)	2	44	1	16	8	250.43	403	None	
16680	42519267	Caucasian	Male [40-50)	1	51	0	8	197	157	250	None	Steady	Yes	NO	35754	82637451	Caucasian		
Male [50-60)	3	31	6	16	414	411	250	None	Steady	Yes	>30	55842	84259809	Caucasian	Male [60-70)	4	70	1	21
414	411	V45	None	Steady	Yes	NO	63768	114882984	Caucasian	Male [70-80)	5	73	0	12	428	492	250		
None	No	Yes	>30	12522	48330783	Caucasian	Female [80-90)	13	68	2	28	398	427	38	None	Steady	Yes	NO	
15738	63555939	Caucasian	Female [90-100)	12	33	3	18	434	198	486	None	Steady	Yes	NO	28236	89869032	AfricanAmerican		
Female [40-50)	9	47	2	17	250.7	403	996	None	Steady	Yes	>30	36900	77391171	AfricanAmerican	Male [60-70)	7	62	0	11
157	288	197	None	Steady	Yes	<30	40926	85504905	Caucasian	Female [40-50)	7	60	0	15	428	250.43	250.6	None	
427	None	Down	Yes	<30	42570	77586282	Caucasian	Male [80-90)	10	55	1	31	428	411	427	None	Steady	Yes	NO
62256	49726791	AfricanAmerican	Female [60-70)	1	49	5	2	518	998	627	None	Steady	Yes	>30	20	99	99	99	99

Using a more detailed prompt

1. ***Do not try to run it internally.***
2. *Write comprehensive R code to build an XGBoost model for predicting hospital readmission using data from this URL: https://raw.githubusercontent.com/jmcody2014/BA/refs/heads/main/diabetic_data50K.csv*

Review predict-readmit-backup.R

Motivation in R

Do not run this code. I will run it locally. Convert this to R code. I used Sys.setenv(ANTHROPIC_API_KEY = "sk-an... to set the key.