

Design for  
Artificial  
Intelligence

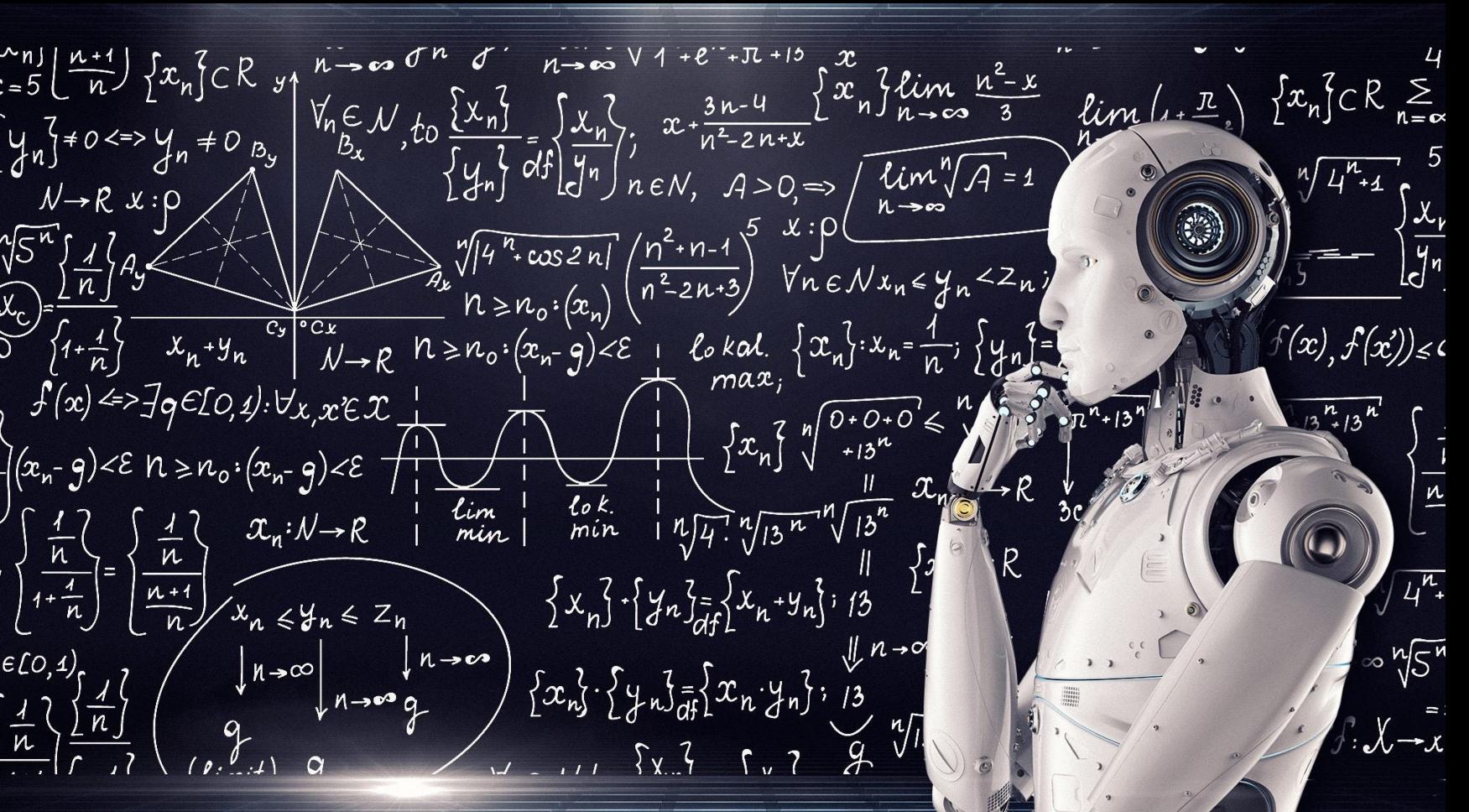
5720 ChatGPT

<https://github.com/iportilla/lowcode>

- Intros
- ChatGPT 101
- Business Examples
- Exercise



- ChatGPT 101
- Business Examples
- Exercise



# Artificial Intelligence

## Machine Learning

### Deep Learning

#### Generative AI



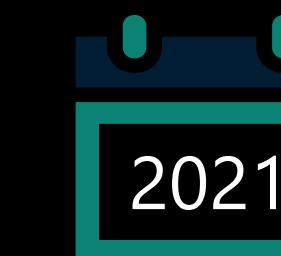
**Artificial Intelligence**  
Intelligence demonstrated by machines



**Machine Learning**  
Learn from data



**Deep Learning**  
Model after the human brain (Neural Networks)



**Generative AI**  
Create new written, visual, and auditory content

# Generative AI

The best thing about AI is its ability to ...

learn	4.5%
predict	3.5%
make	3.2%
understand	3.1%
do	2.9%



# OpenAI

## GTP-4

Why is the sky blue?

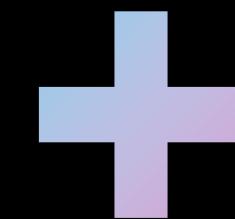
**OpenAI GPTx Answer:**

The sky blue because the Earth's atmosphere scatters sunlight in all directions and blue light is scattered more than the other colors because it travels as shorter, smaller waves

# MSFT partnership with OpenAI



*Ensure that artificial general intelligence (AGI) benefits humanity.*



*Empower every person and organization on the planet to achieve more*

**GPT-3**

Generate and Understand Text

**Codex**

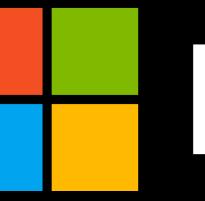
Generate and Understand Code

**DALL·E**

Generate images from text prompts



OpenAI



Microsoft

## Generative AI

GPT-3

Prompt:

Write a tagline for an ice cream shop.

Response:

We serve up smiles with every scoop!

Codex

Prompt:

```
Table customers, columns =  
[CustomerId, FirstName,  
LastName, Company, Address,  
City, State, Country,  
PostalCode]
```

Create a SQL query for all customers in Texas named Jane  
query =

Response:

```
SELECT *  
FROM customers  
WHERE State = 'TX' AND  
FirstName = 'Jane'
```

DALL·E

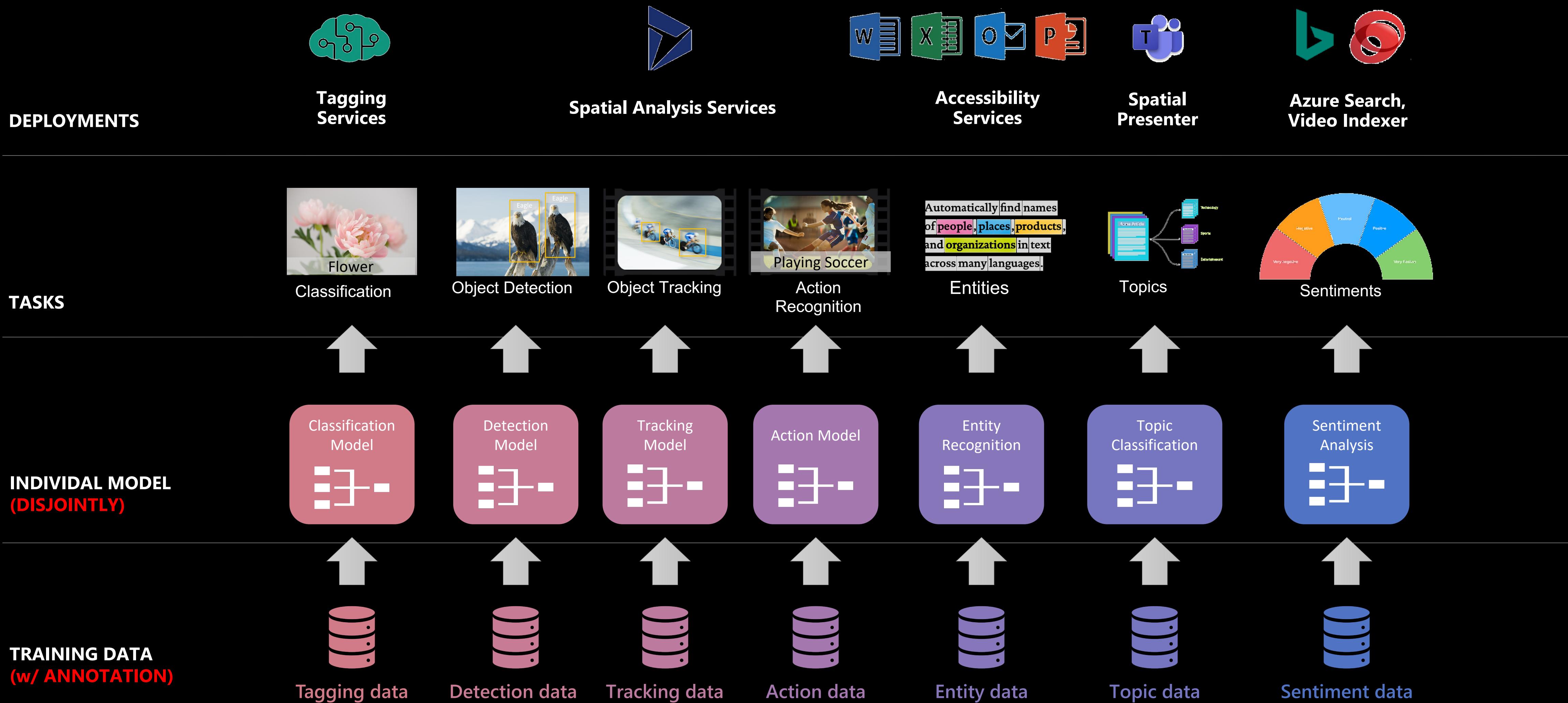
Prompt: A white Siamese cat

Response:

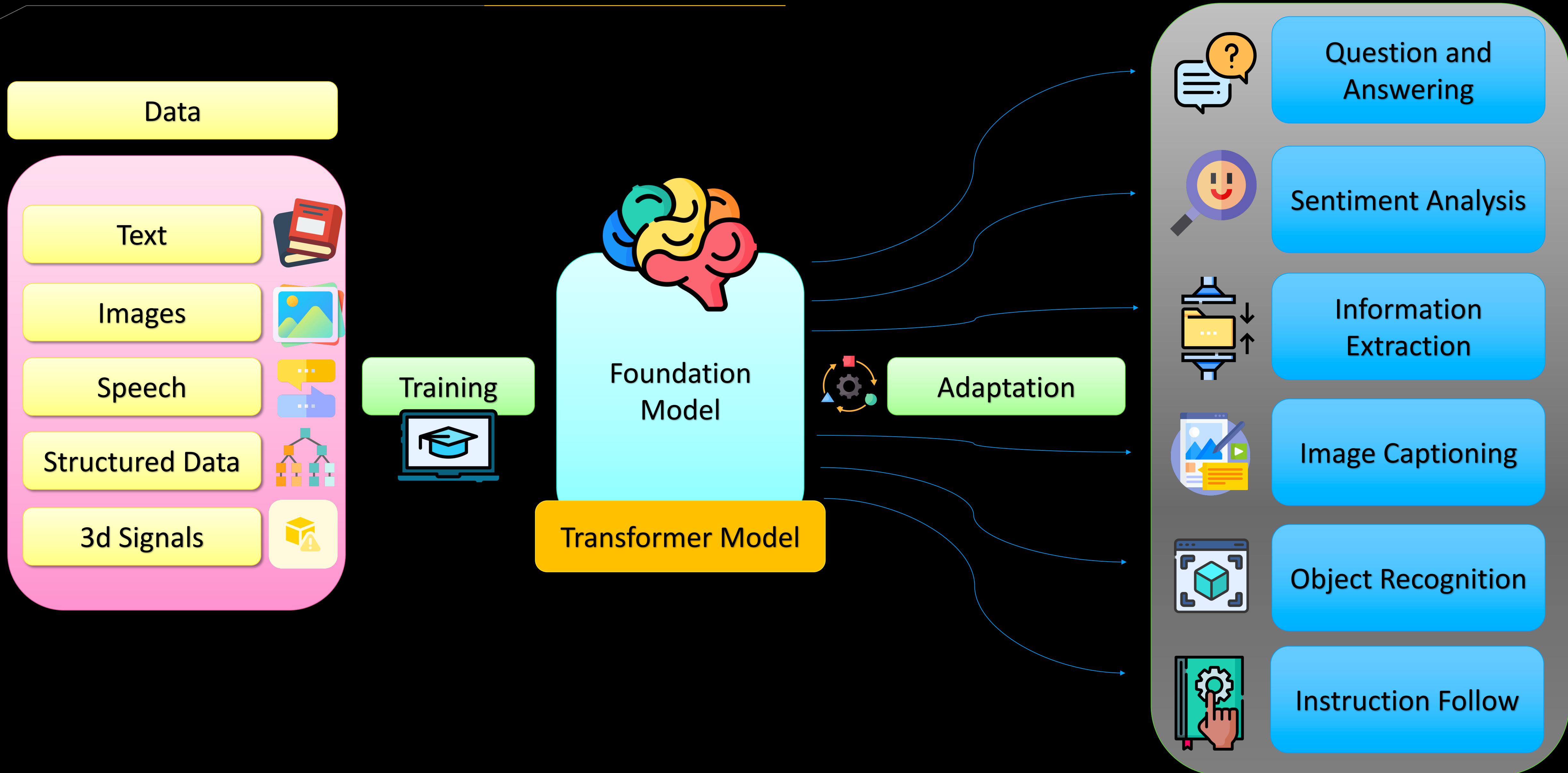


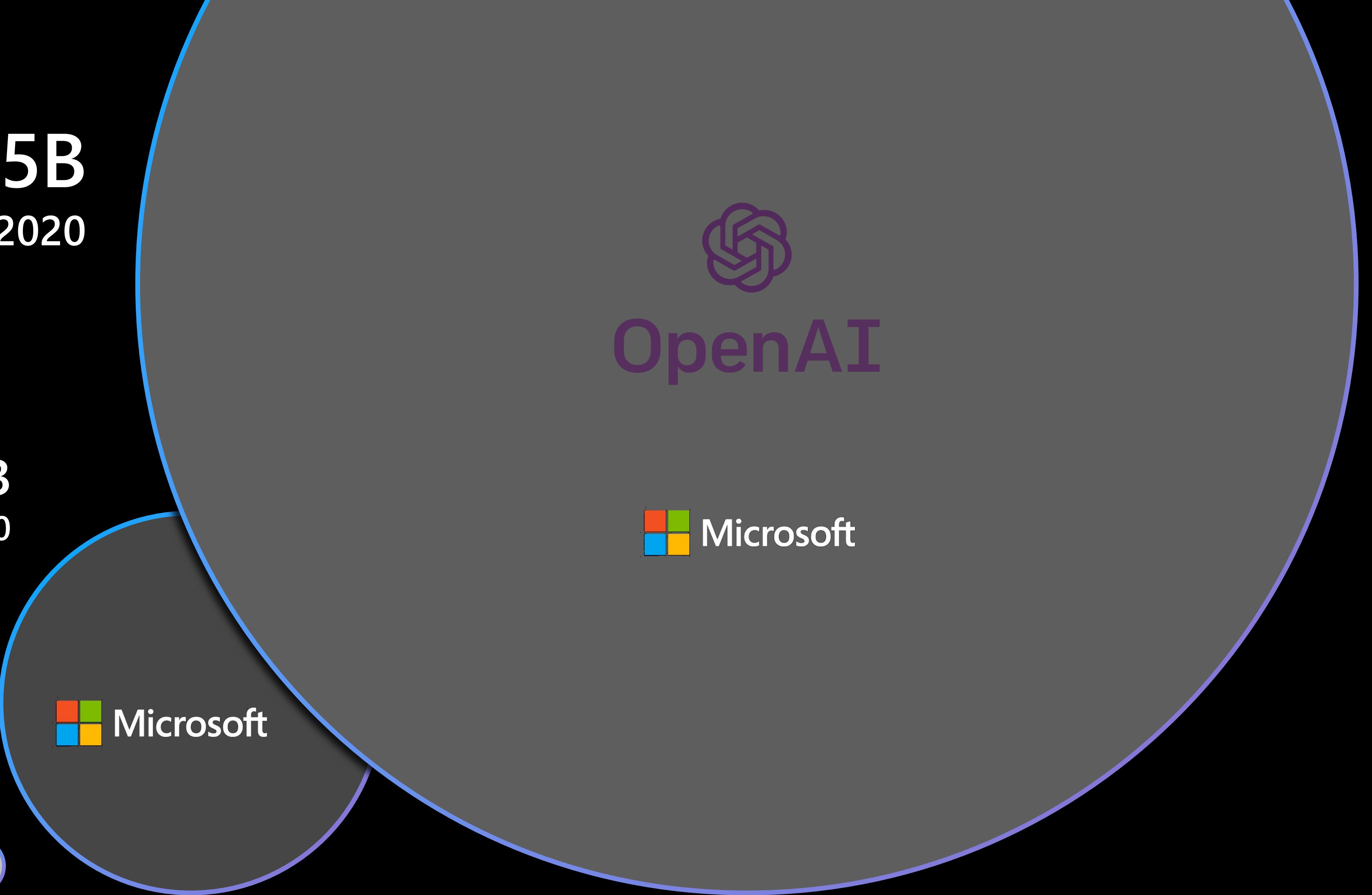
# Traditional model development

High cost & slow deployment - Each service is trained disjointly



# Foundation Models





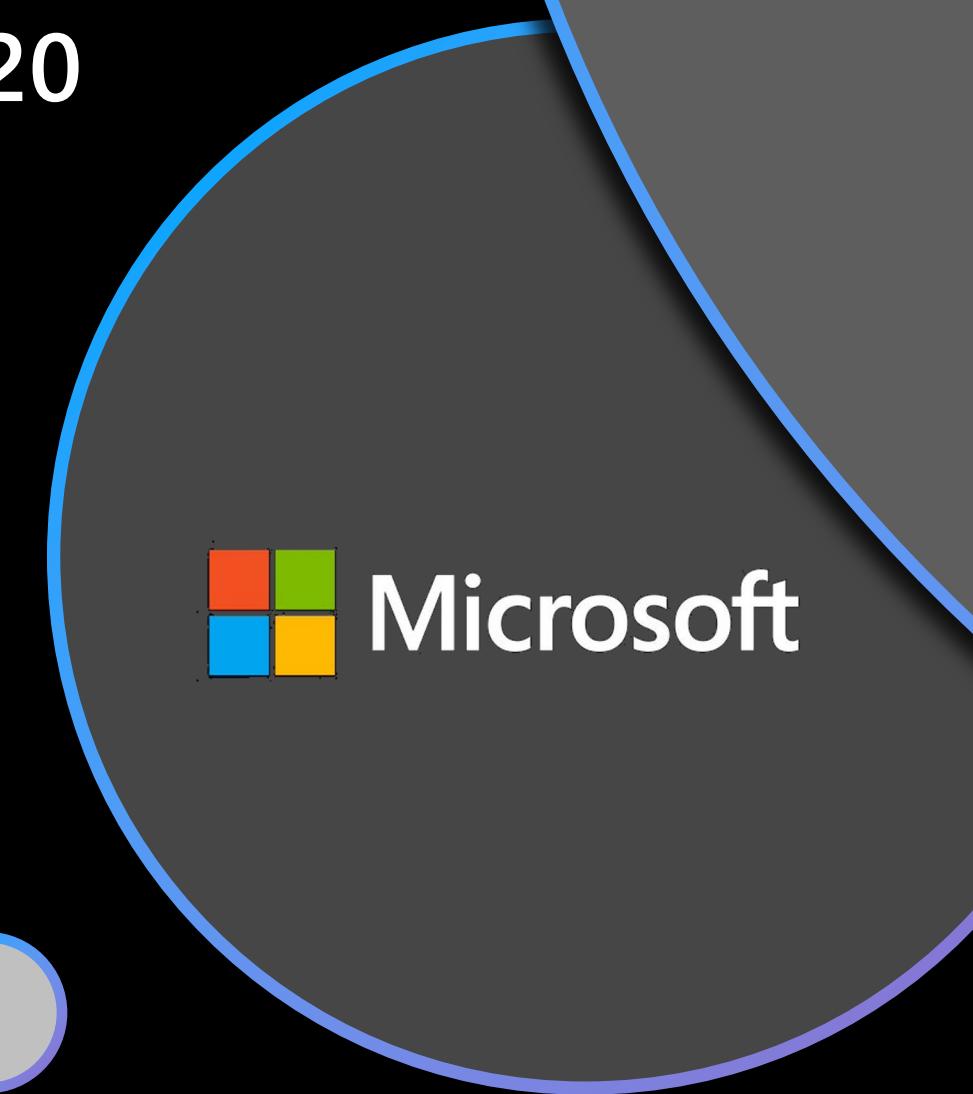
**175B**

GPT-3 | 2020



**17B**

Turing-NLG | 2020



**340M**

BERT-Large | 2018



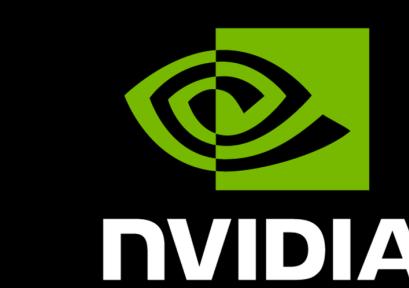
**OpenAI**



**Microsoft**



**Microsoft**



530B

Megatron-Turing  
NLG | 2021

175B

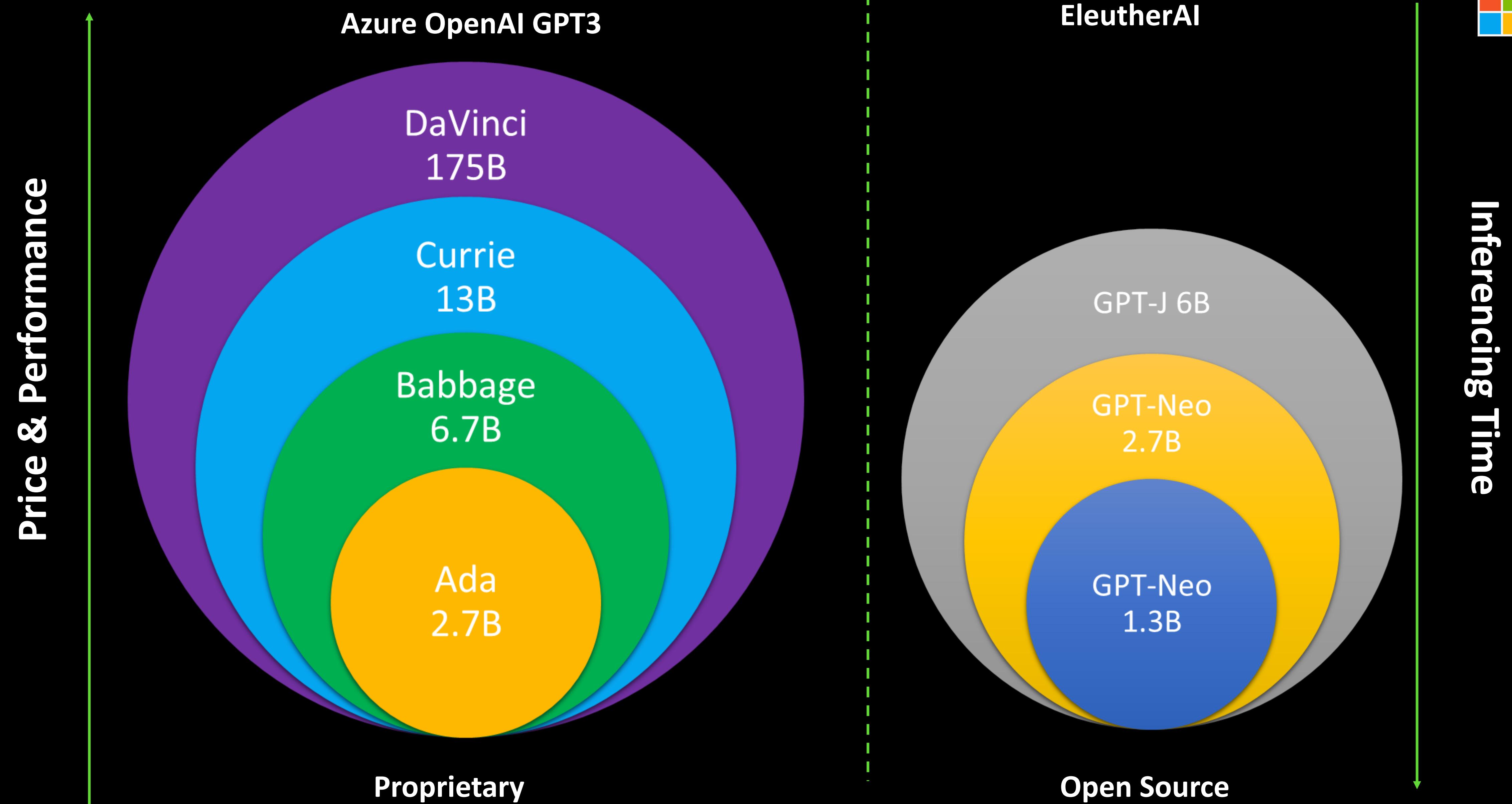
GPT-3 | 2020

17B

Turing-NLG | 2020

340M

BERT-Large | 2018

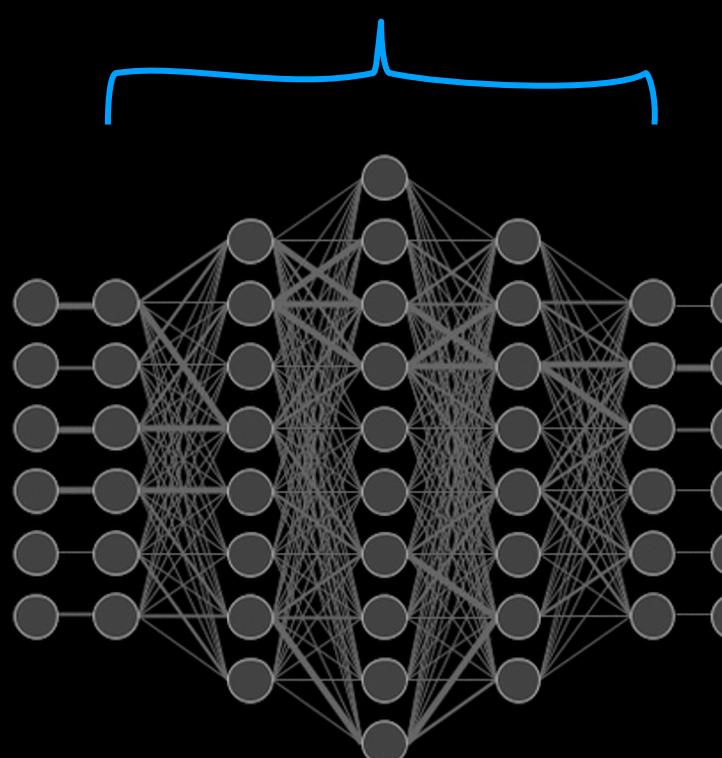


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# Model use out of the box - Prompting

Auto-Regressive  
(Predicts next word)

## Decoder



Foundation Model  
Large Language Model  
GPT-3

## Prompt Instruction

Extract the name of this person in this text.

Text: "My name is Simon,  
order status?"

### Zero-Shot

The model predicts the answer given only a natural language description of the task.

## Prompt Instruction

Decide whether a phrase's sentiment is positive, neutral, or negative.

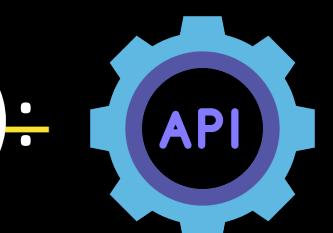
Phrase: "How can I help you today?"

Sentiment:  
Positive

## Completion

Entity (Name):

Simon



## Completion

Sentiment:

Positive

Summary:

## Completion

Customer calling  
regarding an order.

## Prompt Instruction

Summarize the following conversation:

Agent: How can I help you today?

Customer: My name is Simon,  
order status?

## Conversational AI Application

Agent:

How can I help you today?

Customer:

My name is Simon, order  
status?

## Summary of Conversation

Customer calling  
regarding an order.

Abstractive  
Summarization

### One-Shot

In addition to the task description, the model sees a single example of the task

### Few-Shot

In addition to the task description, the model sees a few examples of the task.

# Text Classification

## Named Entity Recognition (Zero-Shot)

Extract the name and mailing address from this email:

Dear Kaylee,

It was great to talk to you at the seminar. I thought Jane's talk  
was quite good.

Thank you for the book. Here's my address 2111 Ash Lane,  
Boulder, CO 80301

Best,

Marilú

Name: Marilú

Mailing Address: 2111 Ash Lane, Boulder, CO 80301

# Text Classification

## Custom Named Entities (Few-Shot)

**Extract job titles from the following sentences.**

**Sentence:** Jane Doe has been working for Microsoft for 20 years as a Linux Engineer.

**Job title:** Linux Engineer

###

**Sentence:** Jane Doe has been working for Microsoft for 20 years and she loved it.

**Job title:** none

###

**Sentence:** Marc Simoncini | Director | Meetic

**Job title:** Director

###

**Sentence:** Damien is the CTO of Platform.sh, he was previously the CTO of Commerce Guys, a leading ecommerce provider.

**Job title:** CTO

# Text Classification

## Multi-Label Text Classification (Few-Shot)

The following is a list of movies and the categories they fall into:

**Topgun:** As students at the United States Navy's elite fighter weapons school compete to be best in the class, one daring young pilot learns a few things from a civilian instructor that are not taught in the classroom.

**Category:** Drama, Action

**Hustle:** A basketball scout discovers a phenomenal street ball player while in Spain and sees the prospect as his opportunity to get back into the NBA.

**Category:** Comedy, Drama, Sport

**The Northman:** From visionary director Robert Eggers comes The Northman, an action-filled epic that follows a young Viking prince on his quest to avenge his father's murder.

**Category:** Action, Adventure, Drama

# Reason Over Unstructured Text

## Question and Answering

On Monday, Microsoft launched an OpenAI service as part of its Azure cloud platform, offering businesses and start-ups the ability to incorporate models like ChatGPT into their own systems. The company has already been building AI tools into many of its consumer products, such as a DALL-E 2 feature in its Bing search engine that can create images based on a text prompt, and the information reported recently that it's working to bring more of them to Microsoft Office as well.

What will Microsoft incorporate in its own systems?

Microsoft plans to incorporate AI tools into its own systems, such as a DALL-E 2 feature in its Bing search engine that can create images based on a text prompt, and the information reported recently that it's working to bring more of them to Microsoft Office as well

# Summarization

## Extractive vs Abstractive

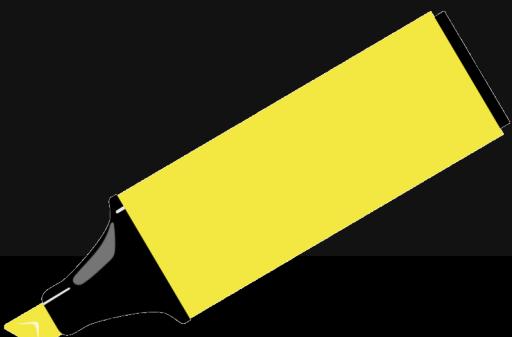
### Extractive

Select parts of the original text to form a summary

- Easier
- Restrictive (no paraphrasing)

Peter and Elizabeth took a taxi to attend the night party in the city. While in the party, Elizabeth collapsed and was rushed to the hospital.

Peter and Elizabeth attend party city. Elizabeth rushed hospital



### Abstractive (Semantic)

Generates new text using natural language generation techniques

- More difficult
- More flexible (more human)

Peter and Elizabeth took a taxi to attend the night party in the city. While in the party, Elizabeth collapsed and was rushed to the hospital.

Elizabeth was hospitalized after attending a party with Peter.



# Abstractive Summarization

## Contact Center Summarization

**Summarize this for a call center agent:**

**Agent:** Thank you for calling ADM. Who am I speaking to?

**Customer:** Hello, my name is Peter Smith. I own a small business and have some questions regarding payroll processing.

**Agent:** Good morning, Peter, before we get started may I ask you a few questions so that I better answer your questions today?

**Customer:** Thank you that is quite helpful. Are there specific regulations that I need to follow?

**Agent:** Certain aspects of payroll processing are regulated by the Internal Revenue Service (IRS) and the Department of Labor (DOL)

The agent is speaking to a customer named Peter Smith. Peter is asking for tips on manual payroll processing. The agent also informs Peter that certain aspects of payroll processing are regulated by the Internal Revenue Service (IRS) and the Department of Labor (DOL).

# Prompt Insert

Only DaVinci-002+

## Before

These are agenda topics for a customer presentation.

1. Introduction to GPT3

[insert]

10. Conclusion

## After

These are agenda topics for a customer presentation.

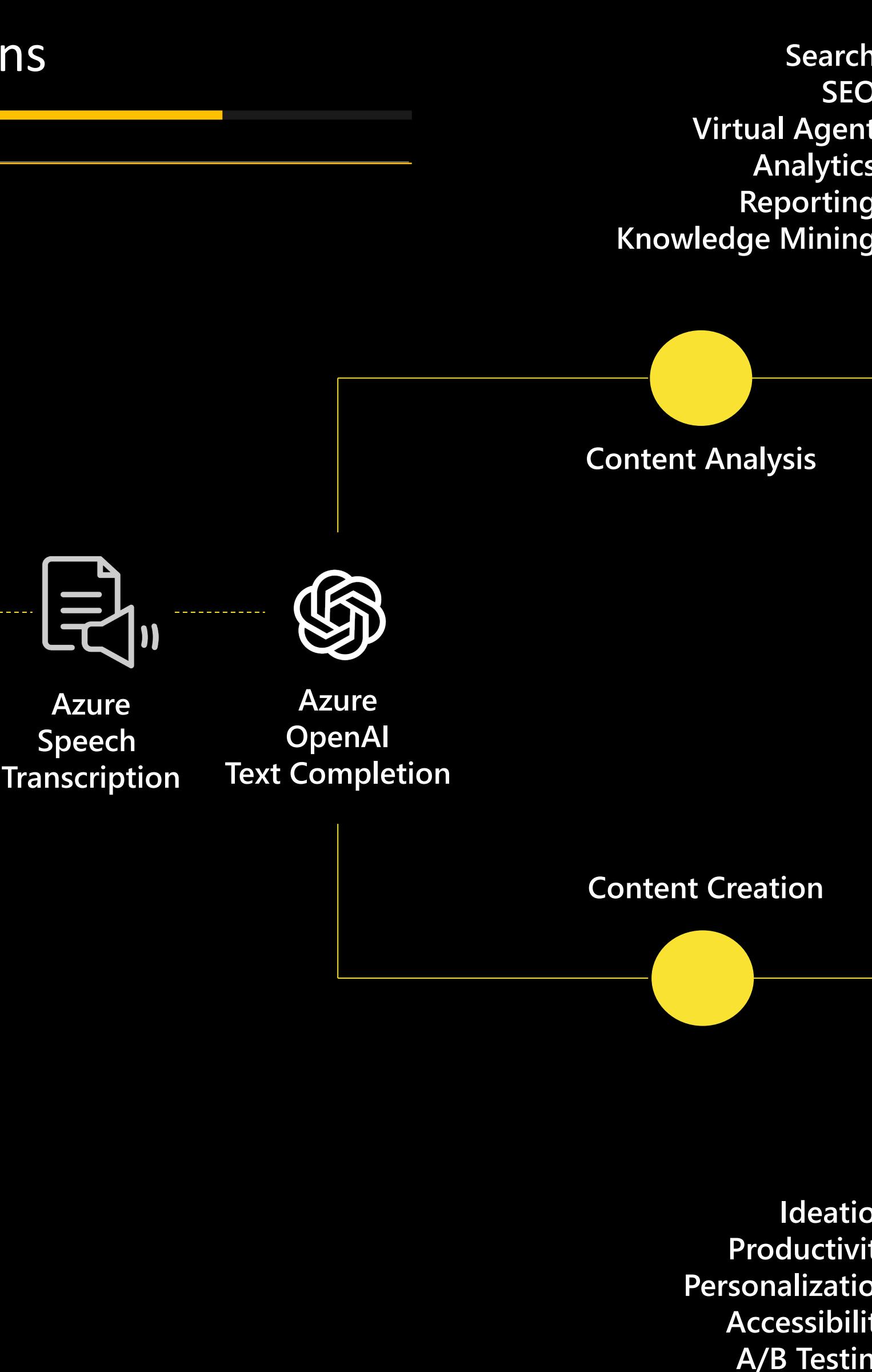
1. Introduction to GPT3
2. Overview of GPT3 Features
3. Benefits of GPT3
4. GPT3 Use Cases
5. GPT3 Pricing
6. GPT3 Security
7. GPT3 Support
8. GPT3 Integration
9. Q&A Session
10. Conclusion

# Media Example

## News Analyses & Article Creations



News Broadcast (Global Warming)



### Topic Classification

Global warming, Deforestation, Carbon footprint

### Entity Extraction

Organizations: IPCC, UNFCCC, Green Peace  
Geography: Canada, USA

### Key Word Extraction

Human activities, fossil fuels, earth atmosphere

### Question and Answer

What is the Intergovernmental Panel on Climate Change (IPCC)?

The IPCC is an international organization that studies climate change and the effectiveness ...

### Video summarization

The article discusses about global warming and its effects on the Earth's atmosphere, wildlife, and human communities. It states that the primary cause of global warming is ....

### News article generation (or blogs, social media)

Global warming is the gradual increase in the overall temperature of the Earth's atmosphere, primarily caused ...

### Script Generation

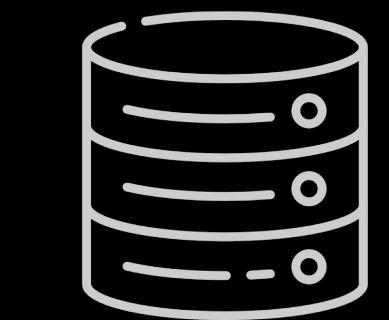
Act 1: The show opens with a shot of a beautiful coastal town  
Act 2: As the town struggles to cope with the crisis ...

### Personalized Content generation (or Advertising)

Simon, as someone passionate about global warming, you are aware of the urgent threat it poses to our planet ...

# Sports & Entertainment Example

Natural language to SQL to surface stats data (Fan Engagement)



Sports Stats  
Database



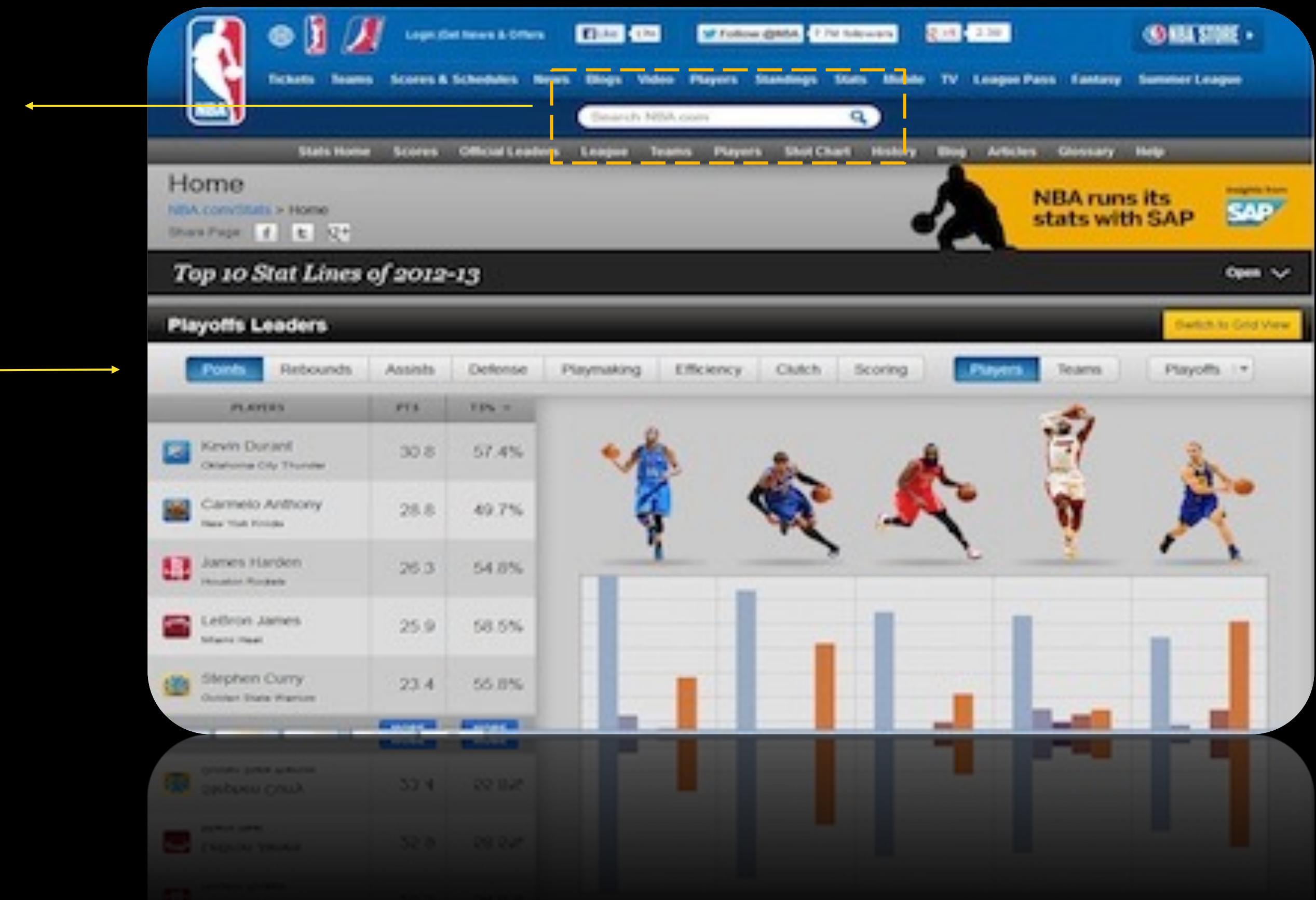
Azure  
OpenAI  
Codex

"How many points did Lebron James score in 2021?"

```
SELECT SUM(points) FROM  
basketball_stats WHERE player =  
'LeBron James' AND game_date  
BETWEEN '2021-01-01' AND '2021-12-  
31';
```

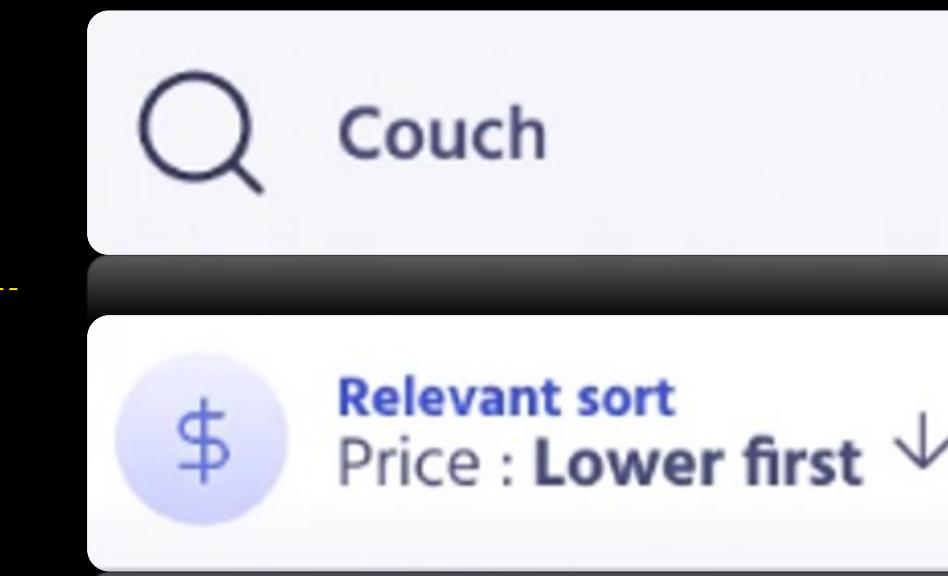
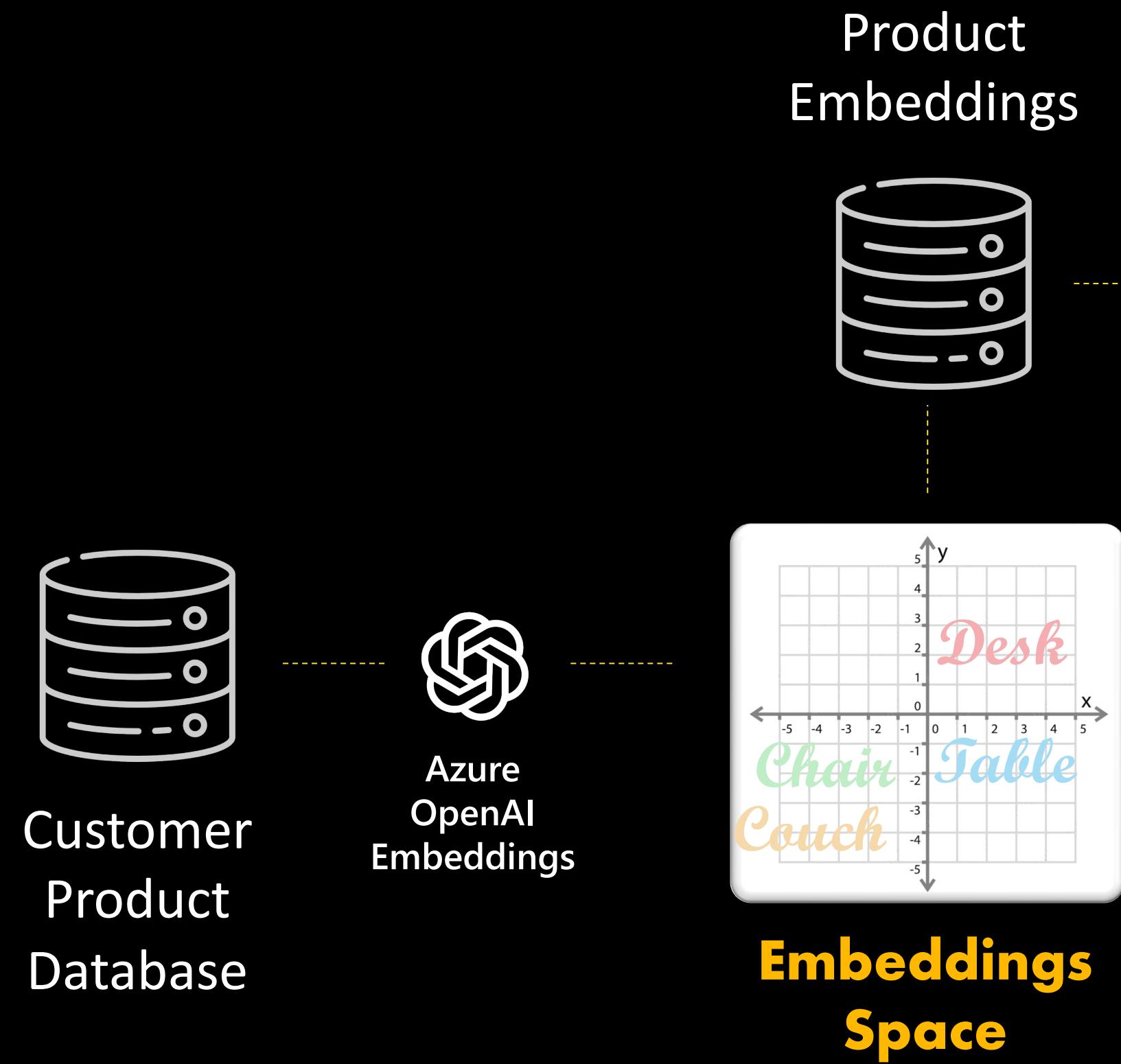
basketball\_stats (player, team, points, rebounds, assists, steals, blocks, turnovers, games\_played)  
("LeBron James", "Los Angeles Lakers", 25, 7, 10, 1, 0, 3, 82), ("Kevin Durant", "Brooklyn Nets", 30, 7, 4, 1, 2, 3, 72)

basketball\_games (home\_team, away\_team, home\_score, away\_score, game\_date)  
("Los Angeles Lakers", "Brooklyn Nets", 110, 105, '2021-12-01'),  
("Milwaukee Bucks", "Golden State Warriors", 120, 115, '2021-12-02')

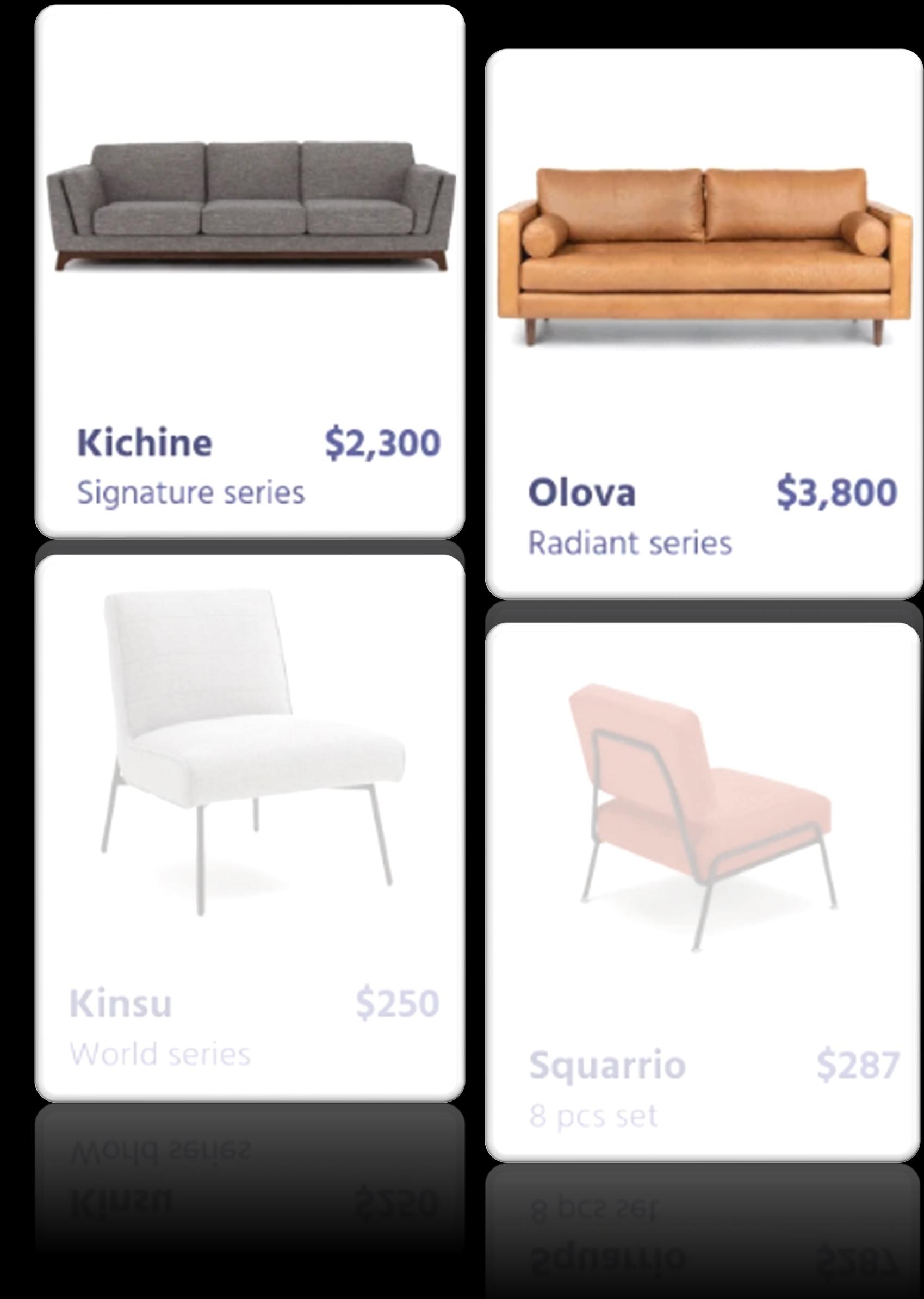


# Retail Example

## Similarity Search



### Similarity Search



# Marketing Example

Digital Creative Assistant – Dalle-2

Synthetic Brand Ambassador (GDPR-safe)

*Input*

Generate a white female

**Generate**

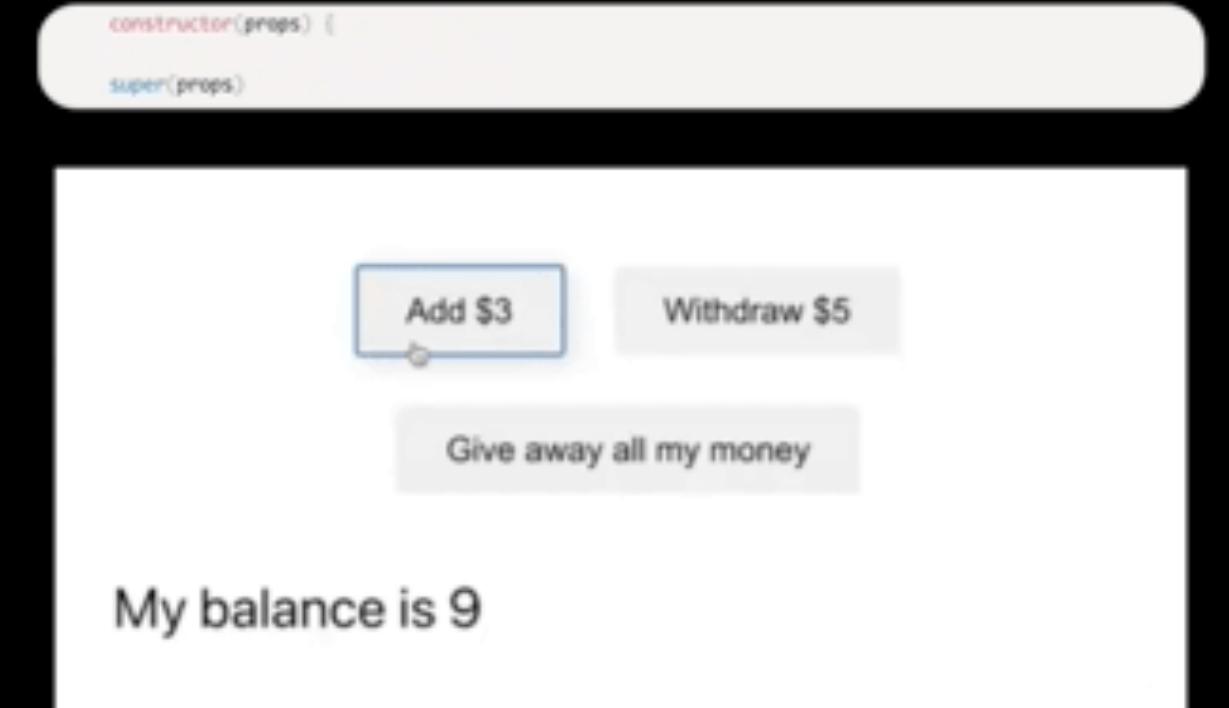
*Output*

No code Web and App Development

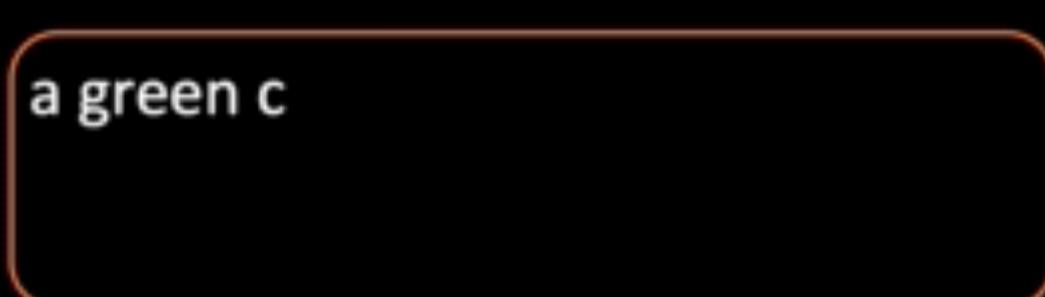
*Input*

*Output*

a button that says "add \$3" and a  
button that says "withdraw \$5",  
and a button that says  
"Give away all my money",  
then show me my balance

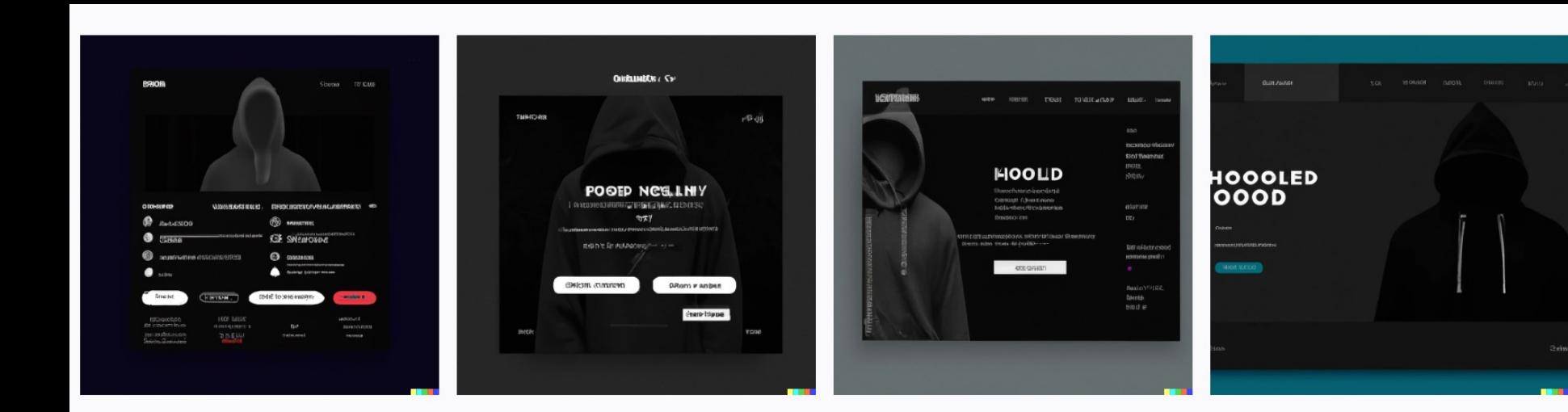


Generate images, concepts and ideas



*Output*

Produce rough Layouts



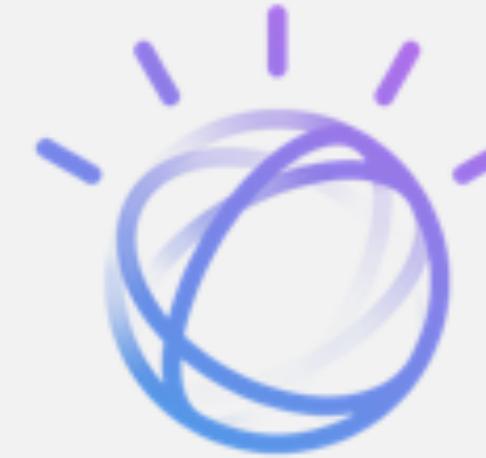
- Intros
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- Exercise

It's not just what  
you say. It's **how**  
you say it.

# Class exercise

## IBM watsonx studio

watsonx



### Summarization



- Meeting transcript summary
- Earnings call summary

### Classification



- Scenario classification
- Sentiment classification

### Generation



- Marketing email generation
- Thank you note generation

### Extraction



- Named entity extraction
- Fact extraction

### Question and Answering



- Questions about an article
- Finance Q&A

### Code



- Code generation
- Code translation

# Completions playground

Only DaVinci-002+

## Before

Azure AI Studio - Completions playground

Deployments Examples

text-davinci-003 Natural language to Python

The example Natural language to Python, works best with model code-davinci-002.

# Write a python function to reverse a string. The function should be an optimal solution in terms of time and space complexity.  
# Example input to the function: abcd123  
# Example output to the function: 321dcba

Generate Undo Regenerate Tokens: 47

## After

Azure AI Studio > Completions playground

Completions playground

Deployments Examples

text-davinci-003 Natural language to Python

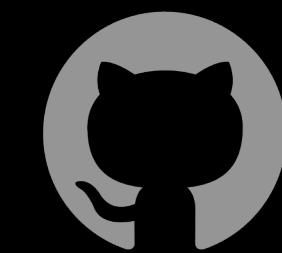
The example Natural language to Python, works best with model code-davinci-002.

# Write a python function to reverse a string. The function should be an optimal solution in terms of time and space complexity.  
# Example input to the function: abcd123  
# Example output to the function: 321dcba

```
def reverse_string(string):  
    return string[::-1]
```

```
2 import os  
3 import openai  
4 openai.api_type = "azure"  
5 openai.api_base = "https://k12-ai-openai.openai.azure.com/"  
6 openai.api_version = "2022-12-01"  
7 openai.api_key = os.getenv("OPENAI_API_KEY")  
8  
9 response = openai.Completion.create(  
10     engine="text-davinci-003",  
11     prompt="# Write a python function to reverse a string. The  
function should be an optimal solution in terms of time and space  
complexity.\n# Example input to the function: abcd123\n# Example  
output to the function: 321dcba\n\ndef reverse_string(string):\n    return string[::-1]",
```

# Backup



OpenAI GitHub

OpenAI Codex  
Model



Public code and text  
on the internet

GitHub



GitHub  
Copilot Service



Don't fly solo.

- Provide editor context
- Provide suggestions
- Improve suggestions

JS fetch\_pic.js

push\_to

```
1 const fetchNASAPictureOfTheDay = () => {
2   return fetch('https://api.nasa.gov/mars/rovers/curiosity/images/latest')
3     .then(response => response.json())
4     .then(json => {
5       return json;
6     });
7 }
```

Copilot



# Azure AI

