



Bootcathon Generative AI

Date: June 29, 2024

Venue: KX Knowledge Exchange

Pre-requisite: Download Microsoft Copilot app on your personal phone



Instructor



Ekgapark (Neung)
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Cloud/GenAI Solutions Architect

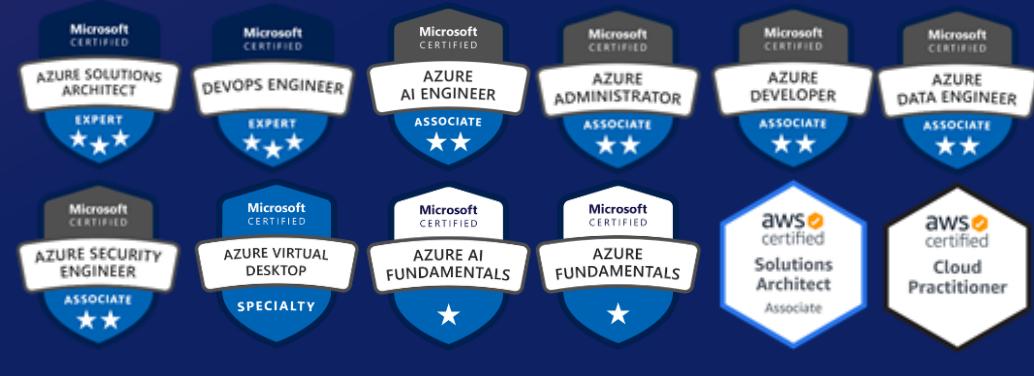


www.linkedin.com/in/ekgapark

Profile

- Computer Engineering - KMUTT (CPE23)
- 11th years with ExxonMobil (3 years in Houston, TX)
- 5 years experiences with Cloud and AI

Skills: Azure, AWS, GenAI, Consulting, Training



Topics

Artificial Intelligence Introduction

What is Generative AI?

GenAI use cases in real world

What is large language model (LLM)?

What is retrieval augmented generation (RAG)?

Prompt engineering

Responsible AI

Fun time!



"create an elephant robot walking in Sathorn Road in Bangkok with the Songkran parade along the street during day time"

Getting Ready



Copilot

Take the power of AI on the go with the Copilot app. Your everyday AI companion.

Download now for a 1-month free trial of Copilot Pro



Download on the
App Store



GET IT ON
Google Play

Artificial Intelligence (AI)

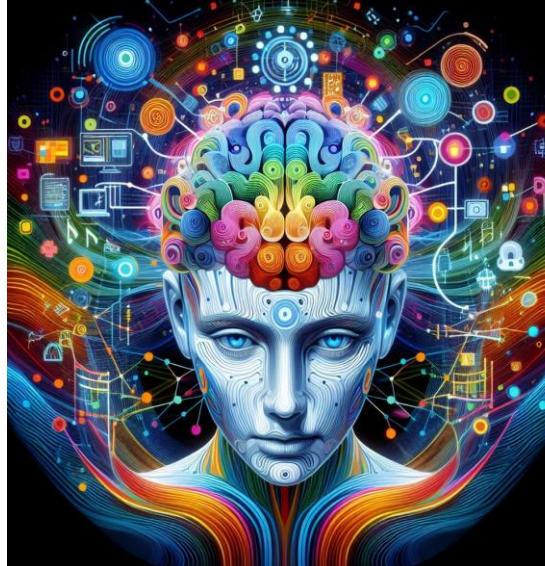


"a futuristic python snake robot with a crown on its head, professional and elegant"

Artificial Intelligence

Artificial Intelligence (AI)

"AI refers to the development of computer systems that can **perform tasks** that typically require human intelligence. These tasks include things like understanding natural language, recognizing patterns, making decisions, and solving problems."



Machine Learning (ML)

"ML is a subset of AI. It involves training a computer program to **learn from data** without being explicitly programmed. In other words, it's about creating algorithms that can improve their performance over time by learning from examples."



Generative AI (GenAI)

"Generative AI is a type of AI that can **create new content**, such as images, music, or text. It generates original material rather than just analyzing existing data."

Artificial Intelligence



Artificial Intelligence, the science and engineering of making intelligent machines



Machine Learning, a major approach to realize AI



Deep Learning



Generative AI



1950's

1960's

1970's

1980's

1990's

2000's

2010's

2020's

Artificial Intelligence

Is the broad field of developing machines that can replicate human behavior, including all aspects of **perceiving, reasoning, learning, and problem solving**

Machine Learning

Is a major approach to **achieve AI by teaching machines to learn relationships hidden in data, and build approximate models of real systems**

Deep Learning

is a **branch of Machine Learning** that uses '**neural networks**' to **model real systems** by mimicking how the human brain works, utilizing millions of computational 'neurons'

Generative AI

is a **branch of Deep Learning** that uses exceptionally large neural nets called **Large Language Models** (with 100's of billions of neurons) that can learn especially abstract patterns

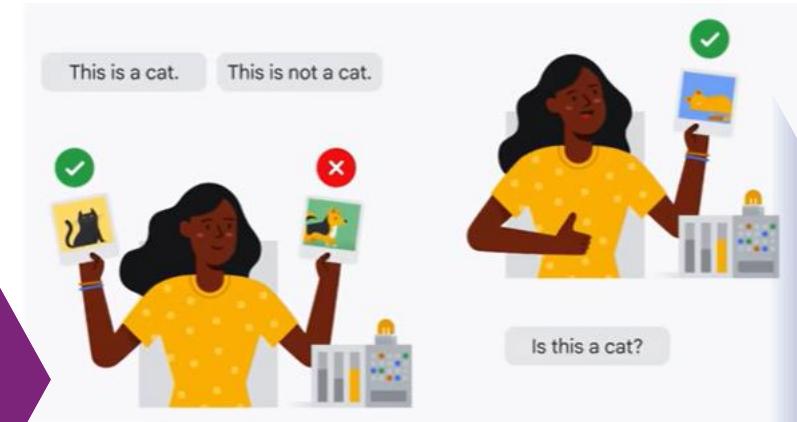
Applying these language models to interpret and create text, images, video, and data has become known as **Generative AI**

Artificial Intelligence

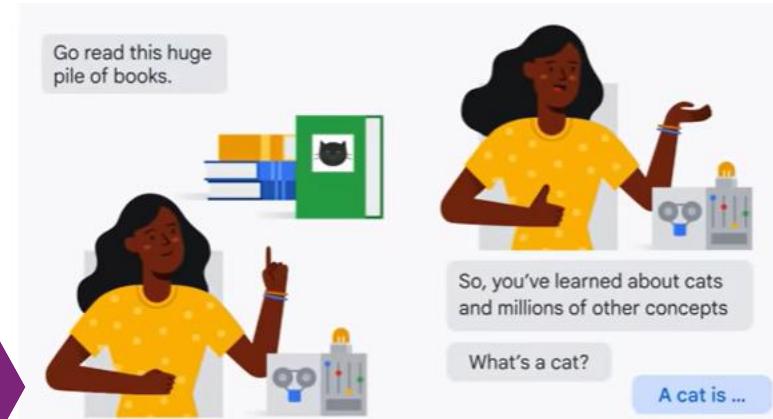
Traditional Programming



A programmer **explicitly writes rules or instructions** for the computer to follow. These rules dictate precisely how the computer should process input data to produce the desired output.



Machine learning focuses **on learning patterns from data** to make predictions or classifications. There are no algorithms programmed; instead, it learns from data consisting of reviews labeled as positive or negative.



Generative language models learn about patterns in language through huge amounts of training data. Then, given some text, they predict what comes next based **on statistical probability**.

What is machine learning?

CLASSIFICATION



Machine Learning



- **Definition:** Machine Learning (ML) is a branch of artificial intelligence (AI) that focuses on building systems that can learn from and make decisions based on data.
- **Data-Driven:** ML algorithms use large datasets to identify patterns and make predictions or decisions without being explicitly programmed for specific tasks.
- **Types of Learning:** There are three main types of ML: Supervised Learning (trained on labeled data), Unsupervised Learning (trained on unlabeled data), and Reinforcement Learning (learning through interaction with an environment).
- **Applications:** ML is used in various fields such as healthcare (predicting patient outcomes), finance (fraud detection), and technology (recommendation systems).
- **Continuous Improvement:** ML models improve over time as they are exposed to more data, allowing them to make more accurate predictions and decisions.

Machine Learning

	Supervised Learning	Unsupervised Learning
Definition	Uses labeled data to train models to make predictions or classifications	Uses unlabeled data to find hidden patterns or intrinsic structures
Data Requirement	Requires labeled data (input-output pairs)	Requires only input data without labels
Algorithm Types	Classification, Regression	Clustering, Association, Dimensionality Reduction
Goal	Predict outcomes or classify data into predefined categories	Discover hidden patterns or groupings in data
Examples of Algorithms	Decision Trees, Support Vector Machines, Linear Regression	K-means Clustering, Hierarchical Clustering, Principal Component Analysis (PCA)
Accuracy Measurement	Measured using metrics like accuracy, precision, recall, and F1-score	Evaluated using metrics like silhouette score, Davies-Bouldin index
Complexity	Generally more complex due to the need for labeled data and model training	Often less complex as it involves finding patterns without labeled data

Supervised Learning:

- **Spam Detection:** Classifying emails as spam or not spam based on labeled training data.
- **Image Classification:** Identifying objects in images, such as distinguishing between cats and dogs.
- **Predicting House Prices:** Using features like location, size, and number of bedrooms to predict house prices.

Unsupervised Learning:

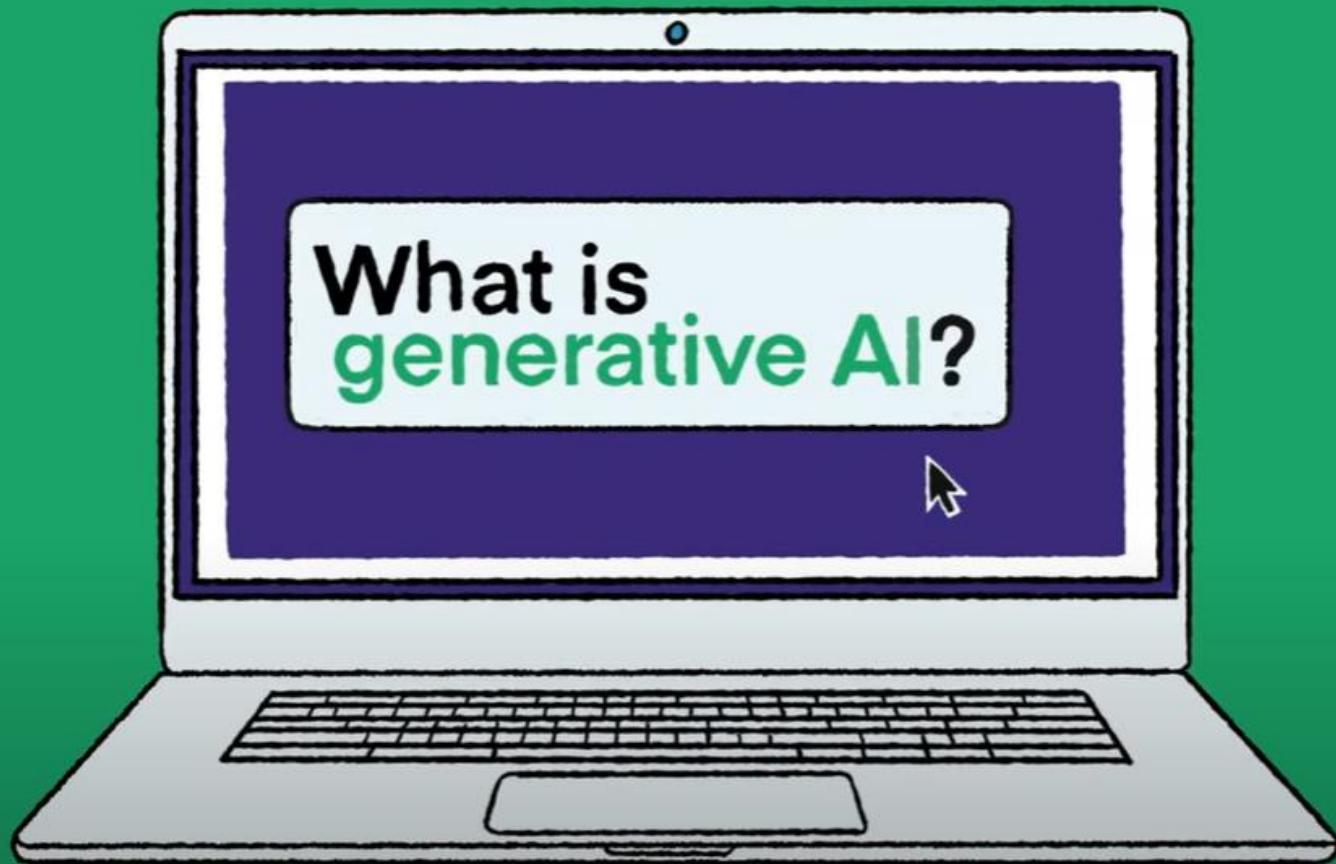
- **Customer Segmentation:** Grouping customers based on purchasing behavior to target marketing efforts.
- **Market Basket Analysis:** Finding associations between products bought together to optimize store layouts.
- **Anomaly Detection:** Identifying unusual patterns in data, such as fraud detection in financial transactions.

What is Generative AI?



"generate a dog robot image with a question mark on his head, make it super cute in white color and big blue eyes"

What is generative AI?



GenAI Use Cases



"generate a cat robot image that looking at the windows on how human use GenAI on their mobile phone on the daily life to generate images"

GenAI Use Cases

Capabilities



Generation



Question
answering



Summarization



Translation



Coding

Input/Output



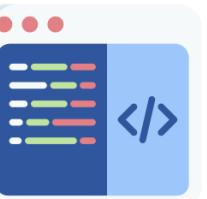
Text



Images



Video/Audio



Code

GenAI Use Cases



Generation



Creative Writing:

Short stories
Poems
Song lyrics
Screenplays
Novels

Entertainment:

Jokes
Riddles
Celebrity parodies
Interactive stories
Role-playing game scenarios

Educational Content:

Study guides
Summaries
Explanations of complex concepts
Quizzes
Practice problems

Online Content:

Blog posts
Social media posts
Product reviews
Comments

Ideation:

Brainstorming ideas
Product names
Business ideas

Professional Writing:

Business emails
Reports
Proposals
Resumes
Cover letters

Planning and Organization:

Itineraries
Event plans
Checklists

Advice and Recommendations:

Travel recommendations
Book/movie recommendations
Life advice

Miscellaneous:

Horoscopes
Fortune telling
Virtual companionship

GenAI Use Cases



Question
answering

Customer
Support

Healthcare

Knowledge
Insights

Technical
Assistance

Interactive
Learning

Mock
Interviews



You

Pretend that you are the interviewer for a developer position and the top 3 IT company, you need to test my skills and attitude to evaluate whether I will fit to this job. Asking one questions at the time starting with a common interview question, then follow by the technical questions for developer roles.



Copilot

Great! Let's get started.

First question: Can you tell me a little about yourself and your background in software development? What motivated you to pursue a career in this field?



You

My name is Mike, I am graduated at the XYZ university on Mars. I am expert in developing Mars programing language with 10 years experience working outside the earth. I want to teach human on earth the Mars programing language and show the world how awesome it is.



Copilot

That's quite an impressive and unique background, Mike! Your experience with the Mars programming language sounds fascinating.

Next question: Can you describe a challenging project you worked on recently? What was your role, and how did you overcome the challenges you faced?



• 2 of 10 responses

AI-generated content may be incorrect

GenAI Use Cases



Summarization



"generate image of turtle robot with sunglasses reading a book on the beach near the East coast, drinking blue Hawaii drink"

News/Articles	Email Summaries	Literature Reviews
Executive Briefings	Financial Report Analysis	Performance Assessment
Academic Research	Product Reviews	Cybersecurity Threat Report
Legal Document Analysis	Social Media Monitoring	Data Analysis
Meeting Minutes	Event Reporting	Script Summarization
Book Summaries	Sales Reports	Market Research

GenAI Use Cases



Translation

Real-time
Translation

Audio Book
Creation

Voice
Command
Recognition

Multilingual
Customer
Support

Travel and
Navigation



GenAI Use Cases



Coding

Code Generation and Auto-completion

Bug Detection and Testing

Natural Language Interaction

Code Refactoring

Code Documentation

Code Translation



"generate an image of the rabbit robot do the coding on PC that show the code stream like The Metrix movie with black background and light green text on the screen"

GenAI will change the way of working

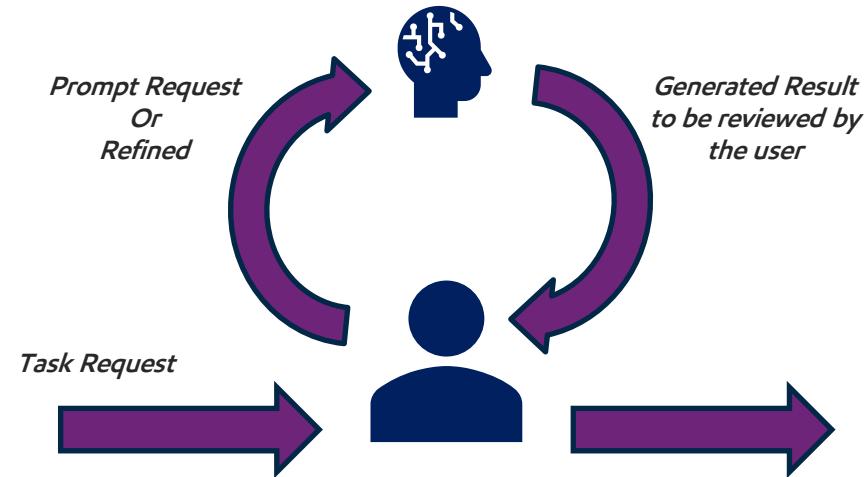
Before AI Assistant



Several activities such as new text creation, drafting emails, summarizing text, and image creation had to be done manually.

With AI Assistant

You will work **with** the AI



There is a new tool that automates activities that couldn't be done before to speed up your content creation process.

*"It's like having an **extra team member** that's always up to date with the latest data and trends, ready to assist in driving your business forward."* - Copilot

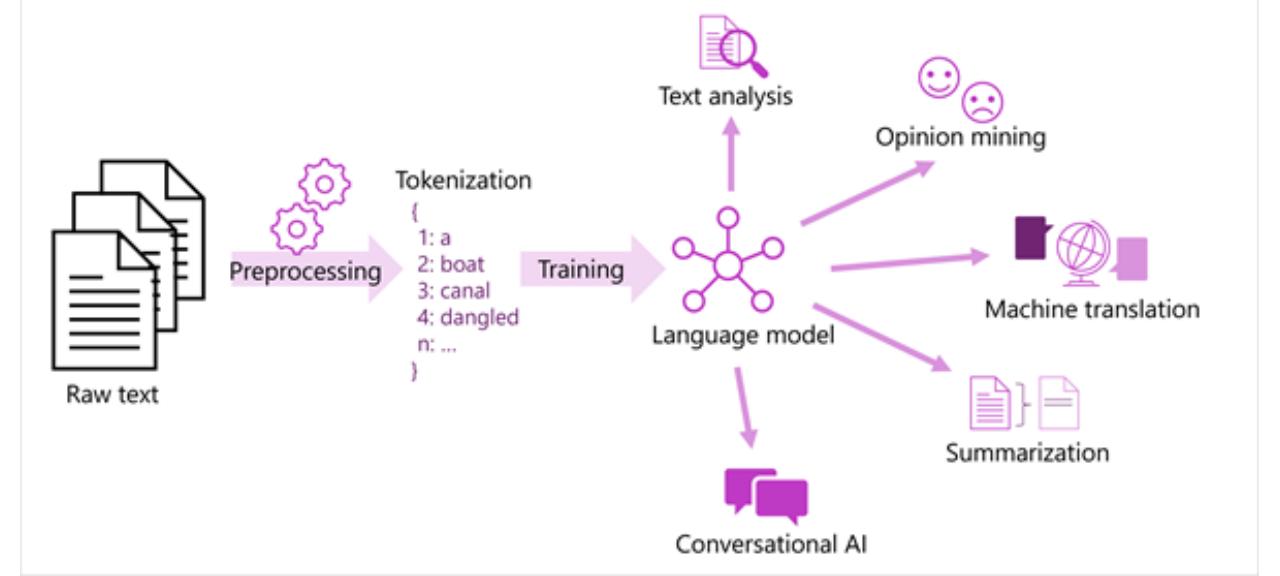
What is Large Language Model (LLM)?



What is Large Language Model?



- LLMs are **AI systems** capable of **understanding and generating human language** by processing vast amounts of text data.
- They are **deep learning algorithms** designed to perform a variety of **natural language processing (NLP) tasks**.
- These models use **transformer architectures** and are trained on **massive datasets**, which is why they're called "large" language models.



What is Large Language Model?

LARGE LANGUAGE MODEL HIGHLIGHTS (JUN/2024)



Token

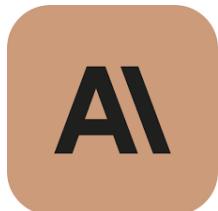
"Tokens are the fundamental units of text that the model processes. When processing text, the input is broken down into tokens. These tokens don't necessarily align exactly with individual words; they can include trailing spaces and even sub-words."

English Tokens

- Approximately **1 token** corresponds to **4 characters** in English.
- Roughly, **1 token** represents **¾ of a word**.
- **1,000 tokens** are equivalent to about **750 words**.
- **1 million tokens** cost **\$10** (GPT-4)

Token calculator example (GPT-4)

- Generative AI is amazing = 16 tokens, 24 characters
- I love you = 14 tokens, 10 characters
- I love you so much = 16 tokens, 18 characters
- ລັນຮັກຄຸນ = 20 tokens, 9 characters



Gemini

∞ Meta

Baidu 百度

/ Grok

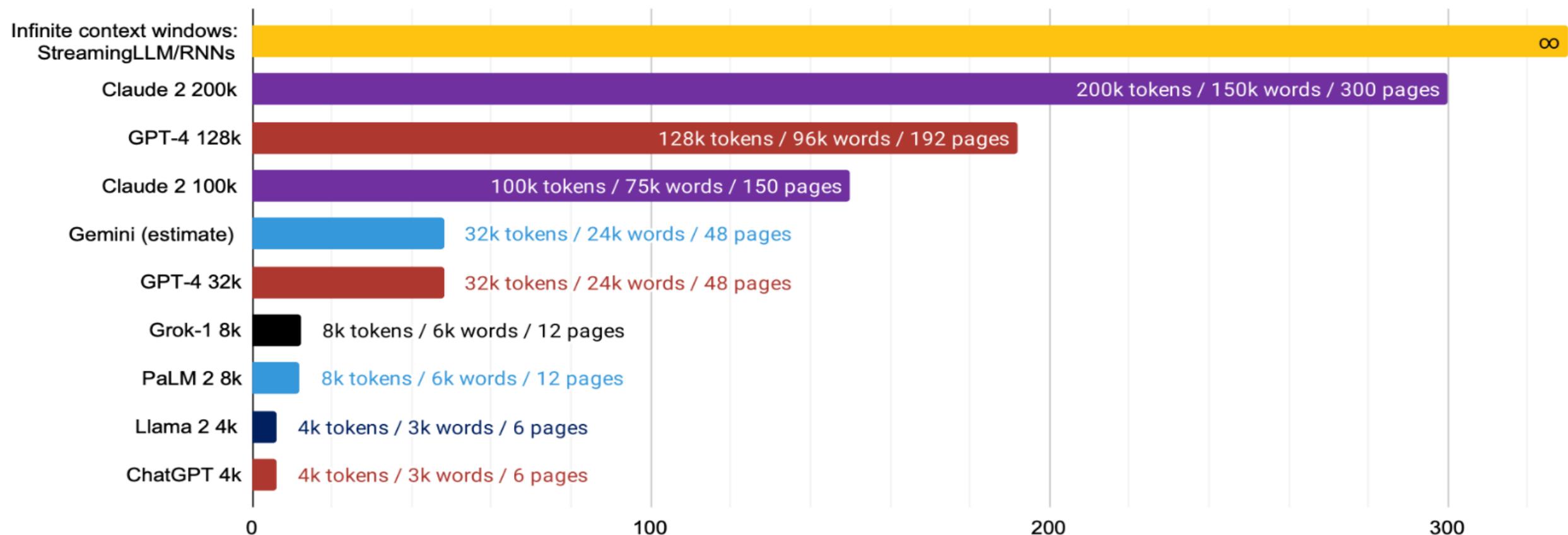


Hugging Face

MISTRAL
AI_

Token

2023 CONTEXT WINDOWS (MAX IN/OUT LENGTH)



What is Retrieval Augmented Generation (RAG)?



"generate a picture of a small green worm robot with PhD hat standing in front of massive shelves of book in a library in New York city"

What is RAG?

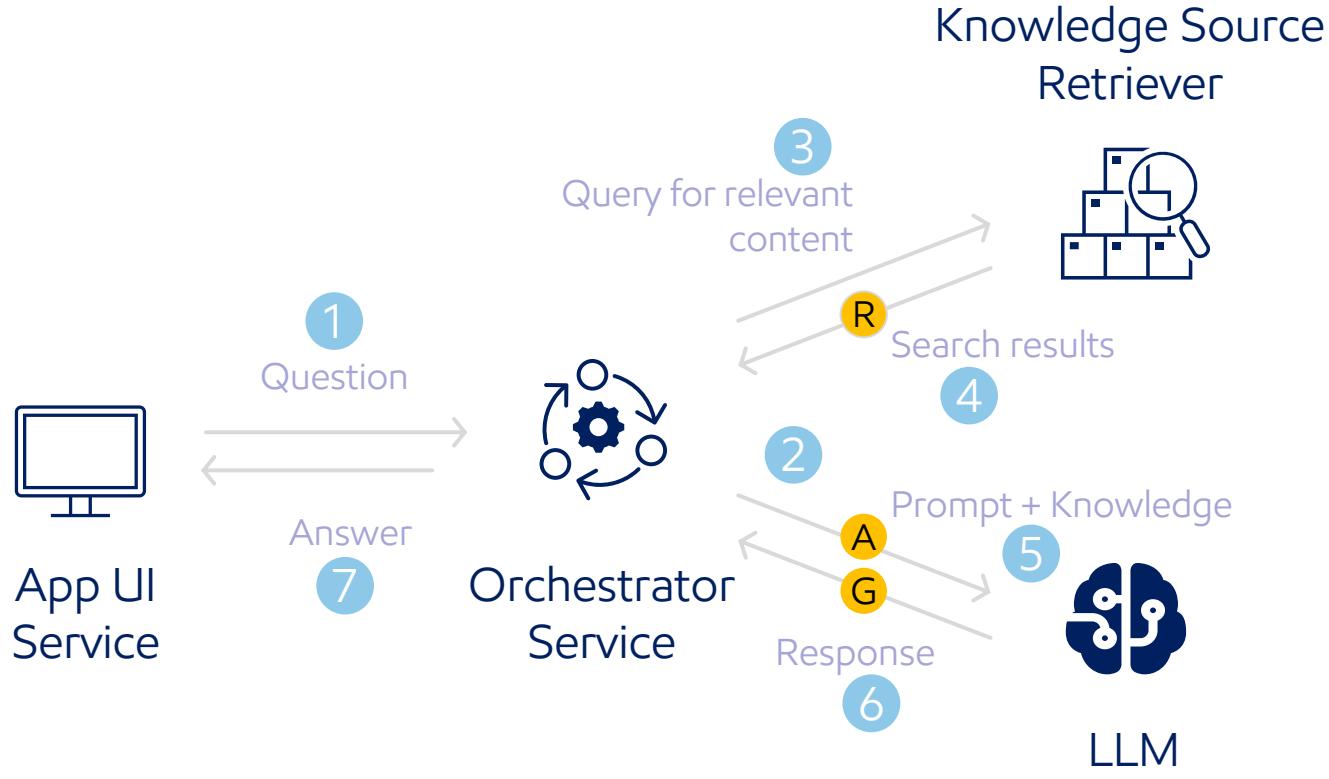


Retrieval-Augmented Generation (RAG) is an innovative architecture that combines the strengths of large language models (LLMs) with **external knowledge** retrieval.

RAG integrates three key components:

- **Large Language Models (LLMs)**: These are powerful language models pre-trained on extensive data. They can generate text, answer questions, and perform various language tasks.
 - **Vector Search and Embeddings**: RAG uses vector embeddings to represent information in an **external knowledge base**. These embeddings act like digital fingerprints, allowing efficient retrieval of relevant data.
 - **Orchestration**: The orchestration layer combines LLM-generated responses with retrieved knowledge. It ensures that the final output is both informative and accurate.

What is RAG?

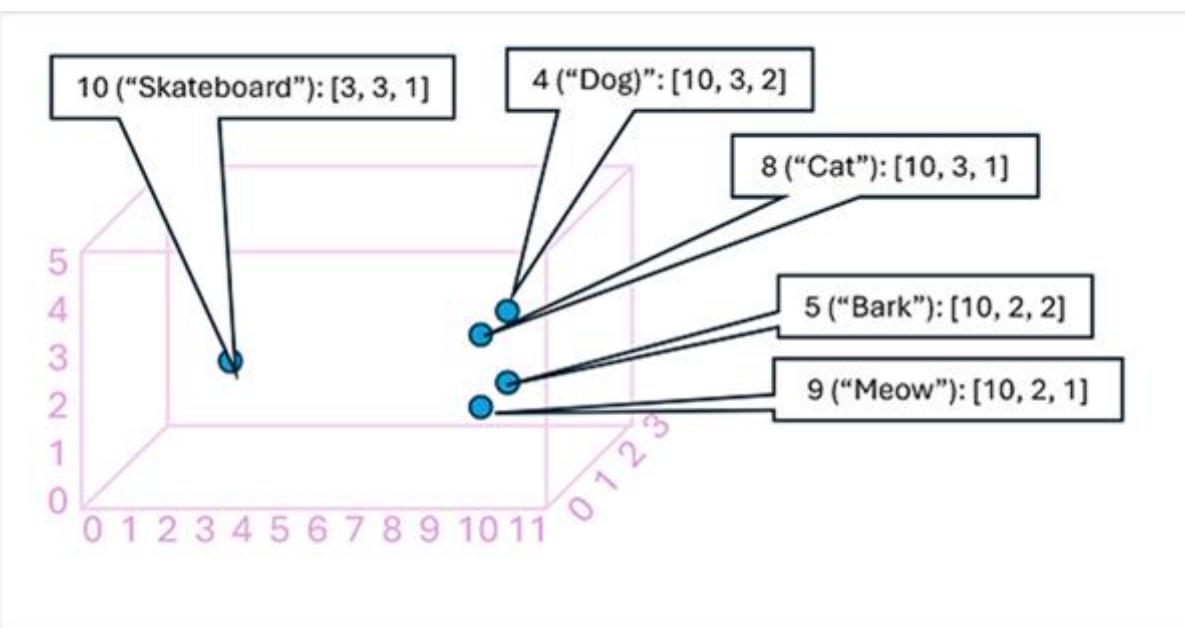


- 1**: The user asks a question
- 2**: The question is first passed to the Large Language Model (LLM), to understand intent and generate keywords
- 3**: The keywords are used to find relevant content in the knowledge source
- 4**: The **R**etrieved search results in vector store are passed back to the orchestrator service
- 5**: The retrieved knowledge is **A**ugmented with the initial question and a meta-prompt carrying preset instructions, then passed to the LLM
- 6**: The LLM **G**enerates a response
- 7**: The response is delivered back to the user

Vector Search

Vector search is a search method used to *find similar items* in a dataset based on their vector representations. In the modern search context, vector search allows search engines to *understand the underlying semantics of natural language queries* and documents, and to retrieve results that are more relevant and accurate.

Vector embeddings



- The vector embeddings value for "dog" is close to "cat" and also to "bark."
- The vector embeddings value for "cat" and "bark" are close to "meow."
- The vector embeddings value for "skateboard" is *further away* from the others.

Benefits of RAG

Enhanced Accuracy & Risk Mitigation:

- RAG integrates private enterprise data with publicly available information.
- GenAI produces more accurate, fact-based answers, minimizing risk.

Context-Rich Text Generation:

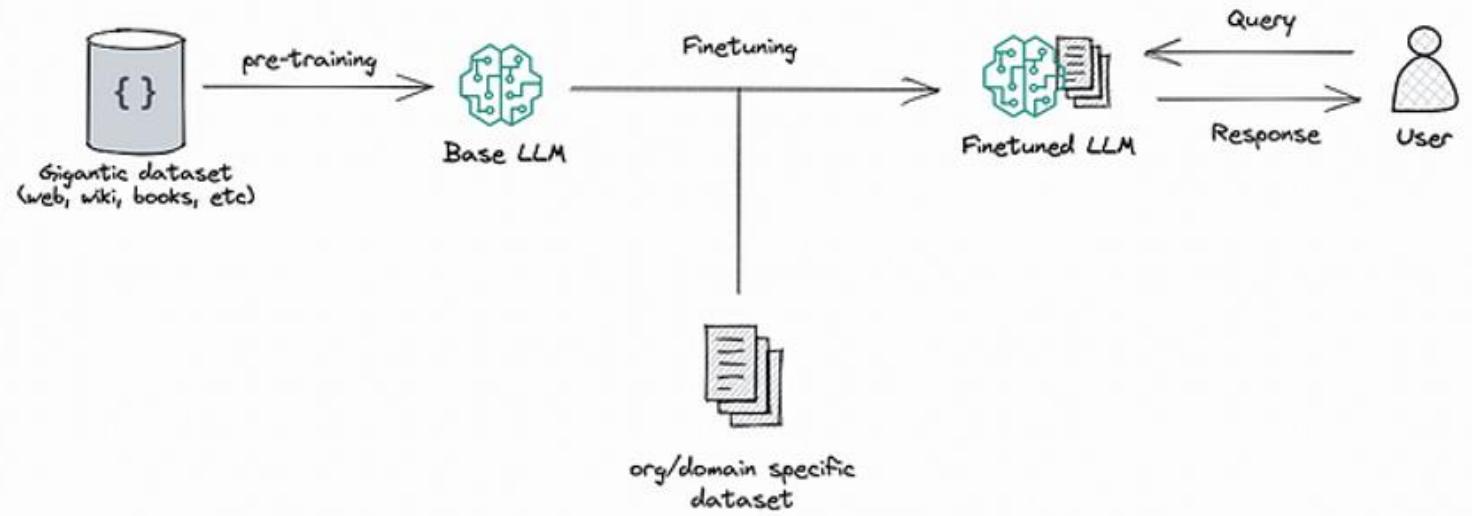
- RAG combines retrieved data with GenAI's capabilities.
- Nuanced responses tailored to specific queries.

Personalization:

- RAG enables personalized recommendations and insights.
- GenAI understands context and delivers relevant information.



RAG vs Fine-tuning



What is Fine-Tuning?

- Fine-tuning involves adapting a pre-trained LLM to perform better on specialized tasks. By training the model on task-specific data, you enhance its performance while retaining its general language knowledge.
- Essentially, fine-tuning allows you to tailor an LLM to specific requirements, making it more adept at handling domain-specific jargon, styles, and nuances.

When to Fine-Tune an LLM?

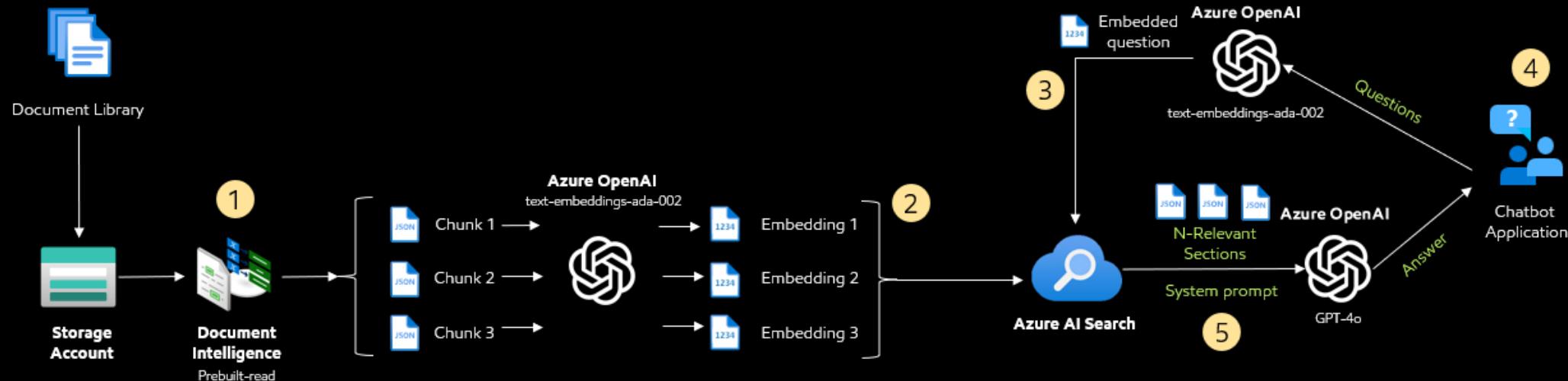
Customization: When you need an LLM to excel at a specific task, fine-tuning is essential.

Task-Specific Data: If you have a small dataset related to a specific task, fine-tuning can adapt the LLM to that task. It bridges the gap between global performance and task-oriented problems.

Resource Constraints: Fine-tuning is an effective way to leverage pre-trained models without building new LLM from scratch.

RAG with Azure AI services

Chat with your data



- 1 Explore document Parsing and chunking
- 2 Embedding chunks and create Azure AI Search Index
- 3 Retrieve search output and interact with Azure OpenAI
- 4 Implement chat with your data web page using Streamlit
- 5 Prompt Engineering

Azure OpenAI



Model as a service (MaaS)

- Advanced AI Models:** Offers a suite of AI models for natural language processing, code generation, and image creation.
- Enterprise-Grade Features:** Provides scalability, security, and compliance to meet enterprise needs.
- Customizable Solutions:** Enables businesses to tailor AI models for specific use cases and integrate them into their applications.
- Global Availability:** Available in multiple regions, allowing for deployment close to user data.
- Continuous Updates:** Regularly updated with the latest AI advancements from OpenAI.
- Support and Documentation:** Offers comprehensive documentation and support to help users get started and troubleshoot issues.

Models	Description
GPT-4o & GPT-4 Turbo NEW	The latest most capable Azure OpenAI models with multimodal versions, which can accept both text and images as input.
GPT-4	A set of models that improve on GPT-3.5 and can understand and generate natural language and code.
GPT-3.5	A set of models that improve on GPT-3 and can understand and generate natural language and code.
Embeddings	A set of models that can convert text into numerical vector form to facilitate text similarity.
DALL-E	A series of models that can generate original images from natural language.
Whisper	A series of models in preview that can transcribe and translate speech to text.

Azure AI Studio

<https://ai.azure.com>

The screenshot shows the Azure AI Studio interface with the 'Chat playground' selected. The left sidebar includes sections for 'All projects', 'Current project', 'Project overview', 'Settings', 'Get started' (with 'Model catalog', 'Model benchmarks', 'Prompt catalog'), 'Project playground' (selected), 'Tools' (with 'Code', 'Prompt flow', 'Tracing', 'Evaluation', 'Fine-tuning'), and 'Components' (with 'Data', 'Indexes'). The main area is titled 'Chat playground' and contains a toolbar with 'Export', 'View Code', 'Prompt flow', 'Deploy to a web app', 'Import', and 'Prompt samples'. It features a deployment dropdown set to 'GenAI_GPT4o', a 'System message' input field with placeholder 'Add your data' and 'Parameters' tabs, and a large text area displaying a response from the AI. The response reads: 'What is GenAI? Explain as I am a master chef in few sentences.' followed by 'GenAI, short for Generative AI, is like a master chef in the world of artificial intelligence. Just as you create unique dishes by combining ingredients in innovative ways, GenAI creates new content—text, images, music, and more—by learning from vast amounts of data. It uses sophisticated algorithms to understand patterns and generate original outputs, much like how you craft a signature recipe from your culinary expertise.' At the bottom, there's a text input field with placeholder 'Type user query here. (Shift + Enter for new line)' and a toolbar with icons for copy, paste, and refresh.

Azure Document Intelligence



- Cloud-Based AI Service:** It's an Azure AI service that helps build solutions for processing documents intelligently.
- Machine Learning Models:** Utilizes advanced machine learning to extract text, key-value pairs, tables, and structures from documents.
- Document Analysis:** Analyzes forms and documents, extracting text and data, and mapping field relationships as key-value pairs.
- Structured Output:** Returns a structured JSON output that's ready for business use.
- Prebuilt and Custom Models:** Offers both prebuilt models for common scenarios and custom models that can be trained on specific datasets.
- Flexible Deployment:** Can be used both on-premises and in the cloud, fitting various business needs.
- Security and Privacy:** Ensures enterprise-grade security and privacy for both data and trained models.

The screenshot shows the Azure Document Intelligence interface with the following details:

- Analyze:** Set to "All pages".
- Content:** The main pane displays a quote from Tom Lawry: "While healthcare is still in the early stages of its AI journey, we are seeing pharmaceutical and other life sciences organizations making major investments in AI and related technologies." Below the quote, there are two callout boxes:
 - "As pharmaceutical and other life sciences organizations invest in and deploy advanced technologies, they are beginning to see benefits in diverse areas across their organizations. Companies are looking to incorporate automation and continuing smart factory investments to reduce costs in drug discovery, research and development, and manufacturing and supply chain management. Many life sciences organizations are also choosing to stay with more virtual approaches in the 'new normal' – particularly in clinical trials and sales and marketing areas."
 - "Tandem was able to create and deploy this innovation by leveraging the AI and machine learning capabilities of the intelligent cloud. As AI and other technologies continue to advance, potential use cases will multiply. 'Speed to value is going to continue to accelerate,' said Lawry."
- Polygon:** A sidebar on the right shows the extracted data in JSON format:

```
While healthcare is still in the early stages of its AI journey, we are seeing pharmaceutical and other life sciences organizations making major investments in AI and related technologies." TOM LAWRY | National Director for AI, Health and Life Sciences | Microsoft
257, 54, 826, 56, 826, 167, 257, 166
11
12
13
14
15
16
17
18
{
  "pageNumber": "pageNumber",
  "angle": 0,
  "width": 915,
  "height": 119,
  "unit": "pixels",
  "words": [
    ...
  ]
}
```

Model ID	Description	Automation use cases
prebuilt-read	<ul style="list-style-type: none">Extract text from documents.Data extraction	<ul style="list-style-type: none">Digitizing any document.Compliance and auditing.Processing handwritten notes before translation.

Azure AI Search



Why Azure AI Search?

- **Advanced Search Capabilities:** Utilizes AI to deliver more relevant search results.
- **Semantic Search:** Understands user intent and the contextual meaning of terms.
- **Cognitive Search:** An AI feature that can extract insights from content.
- **Scalability:** Easily scales with your application's users and data.
- **Security:** Offers robust security features to protect your data.
- **Customizability:** Allows customization of search models to fit specific needs.

Searching options

- **Vector Search:** Use when you need to find items similar to a query in content, meaning, or context, such as finding similar images, documents, or products based on features rather than exact keyword matches.
- **Hybrid Search:** Ideal when you want the benefits of both keyword and vector search. It's useful when you need to handle queries that include both specific keywords and a need for semantic understanding, like searching for products with certain specifications but also similar to an example product.
- **Semantic Reranking Hybrid Search:** Employ this when you have a large set of results from a hybrid search and you need to prioritize them based on their semantic relevance to the query, ensuring that the most contextually relevant items are presented first.

Other LLM Platforms

- **Hugging Face:** Offers a large repository of pre-trained models and tools for building and deploying LLMs. <https://huggingface.co/>
- **Ollama:** Running LLM on local machine <https://ollama.com/library>
- **Together AI:** Platform to deploy and explore LLM API keys with free \$5 credit <https://www.together.ai/>
- **Relevance AI:** Platform to access various LLM models <https://relevanceai.com/>
- **Google AI Studio:** Get Google Gemini API Key, free trial available with limitation <https://aistudio.google.com/>
- **AWS Party Rock:** Explore AWS LLMs including Claude to build LLM app with no code. <https://partyrock.aws/>
- **Claude Console:** Use Claude API key with \$5 credit <https://console.anthropic.com/>
- **Baseten:** Explore opensource model with \$30 credit <https://app.baseten.co/>
- **MistralAI:** Try Mistral LLMs with free trial period <https://mistral.ai>



Hugging Face



together.ai



Gemini

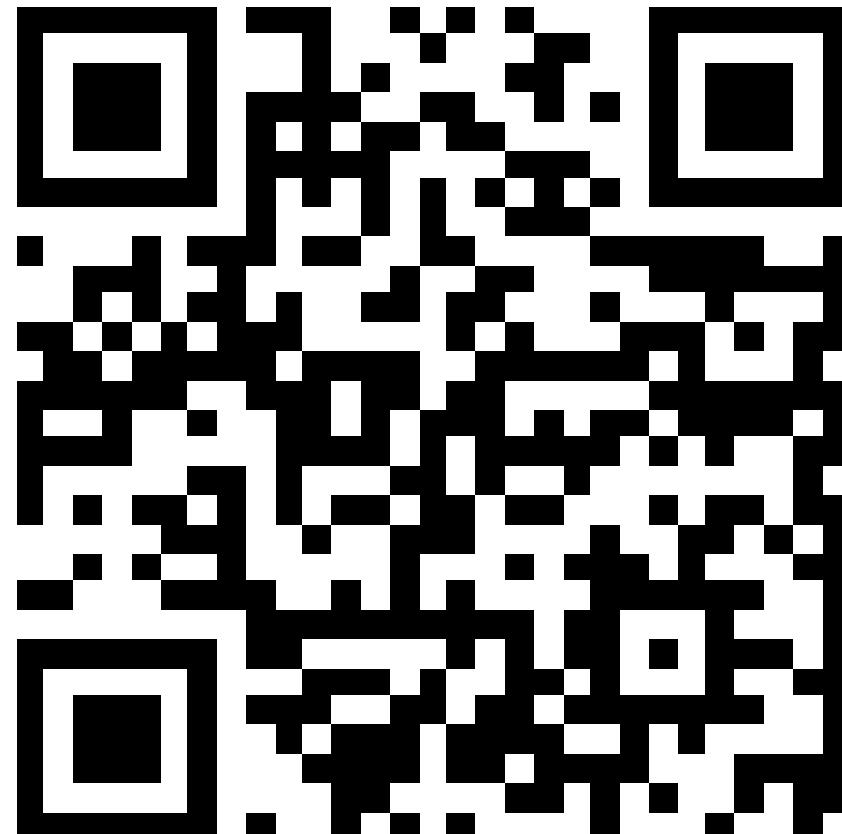
PartyRock



baseten

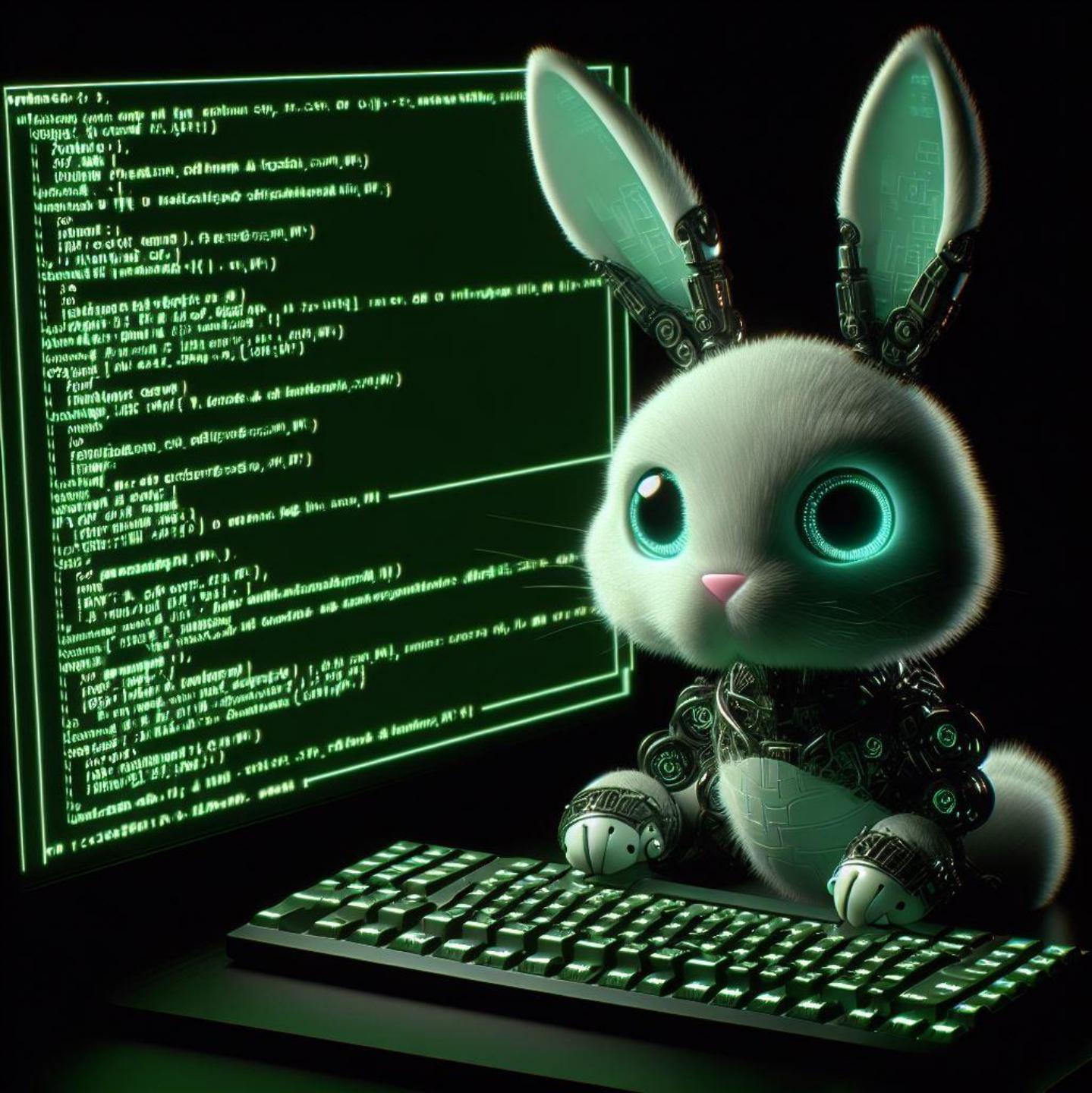


Quiz Time



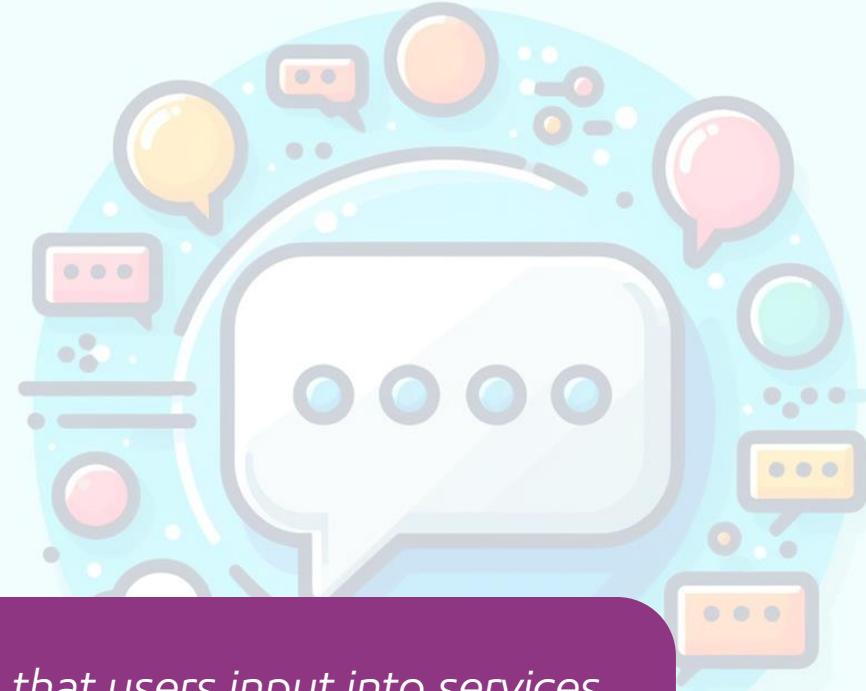
Join Slido.com
#BootcathonGenAI

Prompt Engineering



What is Prompt?

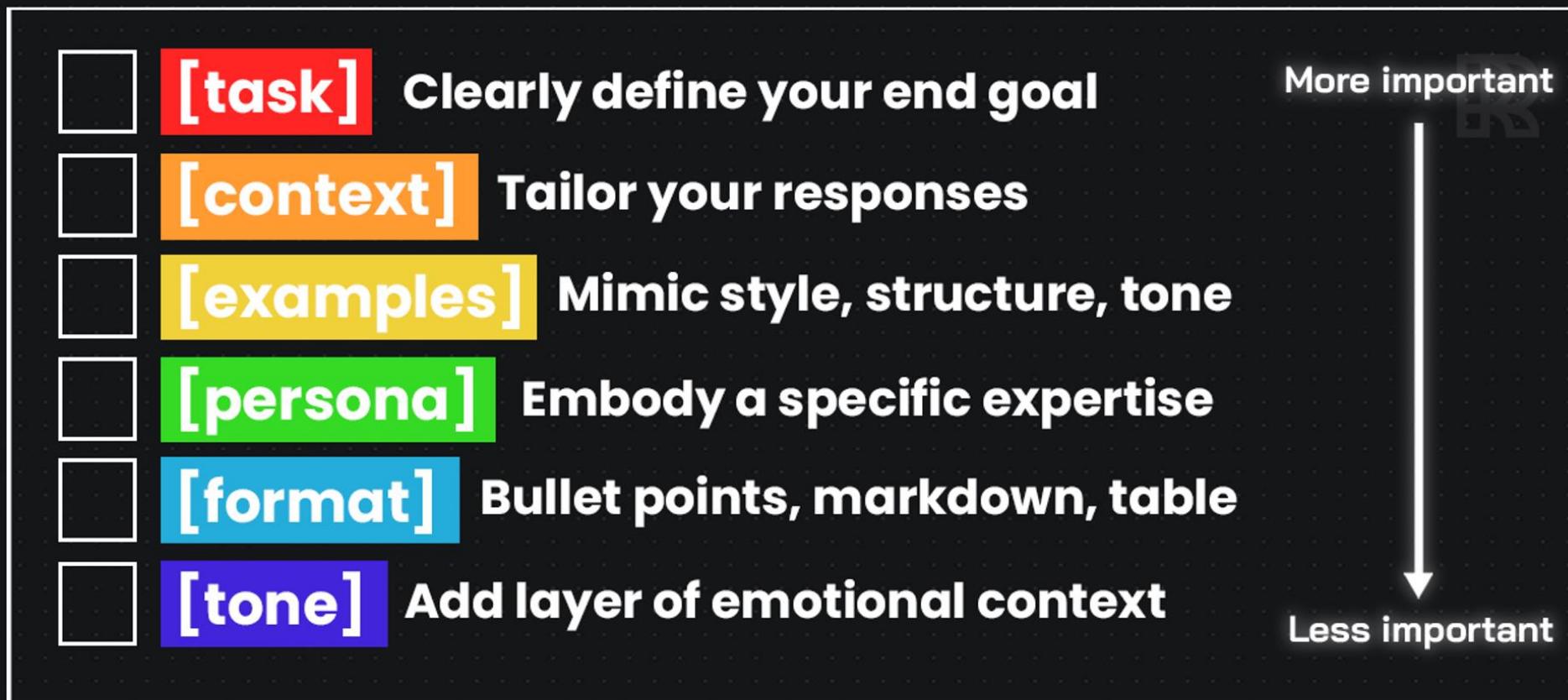
"A prompt is the text message you feed to a LLM model to create a specific outcome or response. You can use prompts for various reasons, like generating text, creating images, analyzing business metrics, or summarizing content."



"Prompt engineering involves refining the prompts that users input into services like Copilot or ChatGPT. By crafting thoughtful and effective prompts, engineers can significantly improve the quality and relevance of AI-generated content, whether it's text, images, code, or data summaries."

Prompt Engineering

The 6-Step Prompt Checklist



Prompt Engineering

1. [Task] Be clear and define your goals

- ✓ When asking for assistance, provide a clear and concise description of what you need.
- ✓ The more specific your request, the better AI can assist you.
- ✓ For optimal results, always begin with an action verb like “create”, “generate”, “write” or “analyze”, etc.



Less Effective



Effective

Example: “Create a plan for a trip to Japan”

This request is too vague. It doesn't specify what kind of help is needed.

Example: “Create a personalized 5-day travel itinerary for a couple visiting Kyoto, Japan. They love historical sites, local cuisine, and scenic views.”

Prompt Engineering

2. [Context] Tailor your response

- ✓ If your query relates to a particular topic, include relevant context or background information.
- ✓ Providing as much context as possible.
- ✓ This helps AI understand your needs better and tailor the response to you.



Less Effective

Example: "Help me lose weight?"

Without context, it's unclear details about yourselves



Effective

Example: "I'm a 95 kg Asian male aiming to lose 10 kg of fat in three months. I only have time to cook meals once a week for 2 hours on Sundays. Provide a three-month diet program to assist me."

Prompt Engineering

3. [Example] Ask for examples or add examples

- ✓ If you're learning a new concept, feel free to ask for examples or practical demonstrations.
- ✓ AI can provide code snippets, explanations, or other relevant content.
- ✓ Provide examples to AI for better understanding, leveraging style and structure of answers.



Less Effective



Effective

Example: "I want to use GenAI in my daily life"
"Create a job description"

Example: "List *examples as many as possible* of Generative AI prompts I can use to in daily life?"
"Create the job description using the format of this existing job description below: *[Add examples]*"

Prompt Engineering

4. [Persona] Tailor results through different audiences

- ✓ You can get better answers from a chatbot by telling it how you want it to provide answers.
- ✓ Define a role for AI to play when generating answers.
- ✓ This way, you can adjust the AI level of understanding to suit your needs.



Less Effective



Effective

Example: “Explain about quantum computing”
“Tell me a joke”

Example: “Explain about Quantum computing to
me like *I'm in 8th grade.*”
“You are an AI assistant designed to entertain. Tell
me a joke.”

Prompt Engineering

5. [Format] Specify the formatting

- ✓ AI-powered can present data and information from multiple sources across the web and in a variety of different ways to improve understanding.
- ✓ Tell the model to summarize specific information in specific format rather than asking an open-ended question.
- ✓ For example, tables, bullet point and outlines can help users see information in a structured format.



Less Effective



Effective

Example: "Please compare Microsoft Office with Open Office"

Example: "Please compare Microsoft Office with Open Office. *Start by* identifying 10 features. For each feature, write 3 pros and 3 cons. Organize the output *in a table*, ordered by feature. Add an evaluation score to each feature, ranging from 1 to 10, and provide a justification in the last column."

Prompt Engineering

6. [Tone] Set the mood of the output

- ✓ Tell the model whether you want a casual, formal, witty, or enthusiastic output.
- ✓ You can ask the model to suggest which tones you can use for your task.



Less Effective



Effective

Example: “Draft an email to employee about upcoming new year party event”

Example: “Draft an email to employee about upcoming new year party event use a *casual tone of voice*”

Prompt Engineering



Benefit of Prompt Engineering

Efficiency Enhancement

- Mastering prompt engineering streamlines tasks and automates processes.
- Well-designed prompts lead to accurate and relevant AI responses.
- Save valuable time and resources.

Optimized Outputs

- Effective prompt engineering minimizes the need for manual review.
- Consistent and high-quality outcomes.
- Achieve better results with minimal post-generation effort.

Faster Decision-Making

- Faster response times.
- Smoother operations.
- Improved overall productivity.

"generate an old male fox robot siting in the office desk reviewing the stack of paper with laptop on the desk, natural lighting, normal wide angle lens."

Effective prompts for coding

- ✓ **Language Specification:** Specify the programming language you want the code in. For example, "[Can you help me write a function in Python that reverses a string?](#)"
- ✓ **Task Description:** Clearly describe the task you want the code to perform. The more specific you are, the better the generated code will likely be. For example, "[I need a **JavaScript** function that takes an array of numbers and returns the sum of all the numbers in the array.](#)"
- ✓ **Input and Output:** If applicable, describe what the inputs and outputs of the code should be. For example, "[Can you write a Java method that takes two integers as input and returns their product as output?](#)"
- ✓ **Code Style or Structure:** If you have any specific requirements about the style or structure of the code, include those in the prompt. For example, "[I need a Python function to calculate factorial of a number. Please use recursion.](#)"
- ✓ **Examples:** Providing an example of what you want can be very helpful. This could be an example of input and output, or even a partial code example. For example, "[I'm looking for a JavaScript function that behaves like this: When I input \[1, 2, 3\], it should return 6.](#)"

Effective prompts for coding

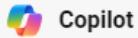
Excel Formulas

- ✓ Provide the background information and GenAI's role:
 - As an Excel Formula Expert, *your task* is to provide advanced Excel formulas that perform the complex calculations or data manipulations described by the user. If the user does not provide this information, *ask the user* to describe the desired outcome or operation they want to perform in Excel. Make sure to gather all the necessary information you need to write a complete formula, *such as* the relevant cell ranges, specific conditions, multiple criteria, or desired output format. Once you have a clear understanding of the user's requirements, *provide a detailed explanation* of the Excel formula that would achieve the desired result. Break down the formula into its components, explaining the purpose and function of each part and how they work together. Additionally, provide any necessary context or tips for using the formula effectively within an Excel worksheet.

- ✓ Request the formula you are looking for. For example:
 - I have a table with sales data, including the salesperson's name in column A, the product category in column B, the sales amount in column C, and the date of sale in column D. I want to *calculate the total sales amount* for each salesperson, but only for sales of products in the "Electronics" category that occurred in the month of January. Can you help me with the Excel formula to achieve this?

Effective prompts for coding

Excel Formulas



Example result:

Absolutely, I can help with that. You can use the `SUMIFS` function in Excel to sum the sales amounts based on multiple criteria. Here's the formula you need:

```
=SUMIFS(C:C, A:A, "Salesperson Name", B:B, "Electronics", D:D, ">=01/01/2024", D:D, "<=31/01/2024")
```

Let me break down this formula for you:

- `SUMIFS` is an Excel function that sums cells in a range using multiple criteria.
- `C:C` is the range of cells you want to sum (the sales amounts).
- `A:A` is the range of cells you want to evaluate with your first criterion (the salesperson's name). Replace `"Salesperson Name"` with the actual name of the salesperson.
- `B:B` is the range of cells you want to evaluate with your second criterion (the product category). In this case, we're looking for sales where the product category is "Electronics".
- `D:D` is the range of cells you want to evaluate with your third and fourth criteria (the date of sale). We're looking for sales that occurred in January 2024, so we use `">=01/01/2024"` and `"<=31/01/2024"` as our criteria.

Please note that the date format in the formula should match the date format in your Excel worksheet. Also, if you want to calculate this for all salespeople, you would need to adjust the formula for each salesperson.

I hope this helps! Let me know if you have any other questions. 😊



Effective prompts to generate images

- ✓ **Image Type:** Specify the type of image you want. For instance, you could ask for a landscape, portrait, abstract, a vectorizable logo or any other specific category.
- ✓ **Subject:** Clearly define the subject of the image. Is it a person, an animal, an object, or a scene? Be as precise as possible
- ✓ **Context:** Provide context to set the scene. Mention the environment, location, or situation related to the image.
- ✓ **Details:** Add specific details you want to see in the image. These could include objects, colors, textures, patterns, or specific elements relevant to your visions.
- ✓ **Lighting:** Describe the lighting conditions. Is it bright daylight, soft twilight, or dramatic shadows?
- ✓ **Framing:** Specific the composition and framing. Do you want a close-up, wide-angle, or panoramic view?
- ✓ **Lens and Camera:** Mention any specific lens or camera effects you'd like to see (e.g., fisheye, bokeh, vintage).
- ✓ **Style:** Choose an artistic style of mood. You can reference art movements (e.g., Impressionism, Cubism) or describe the overall aesthetic you're aiming for.

Effective prompts to generate images

- ✓ **Image Type**
- ✓ **Subject**
- ✓ **Context**
- ✓ **Details**
- ✓ **Lighting**
- ✓ **Framing**
- ✓ **Lens and Camera**
- ✓ **Style**

Example prompt:

"generate a painting of Mona Lisa picture display next to Sponge Bob with gold wooden frame in an art gallery, natural lighting, angle wide shot, shallow depth of field, in the style of starry night from Van Gogh"



Photo Example



- ✓ **Image Type**
- ✓ **Subject**
- ✓ **Context**
- ✓ **Details**
- ✓ **Lighting**
- ✓ **Framing**
- ✓ **Lens and Camera**
- ✓ **Style**

Example prompt:

"generate an image of Wat Phra Kaew with the spaceship that looks like a cute baby seal floating above it. The weather is snowing during the day time. Super wide angle camera view, in the style of Japanese manga"



Responsible AI Principles



Responsible AI for GenAI App

Ethical Uses

- **Transparency:** Clearly inform users when they are interacting with an AI and not a human.
- **Bias Mitigation:** Ensure the AI does not perpetuate or amplify biases present in the training data.
- **Privacy Protection:** Safeguard user data and ensure compliance with data protection regulations.

Accuracy and Reliability

- **Fact-Checking:** Implement mechanisms to verify the accuracy of the information provided by the AI.
- **Error Handling:** Design the AI to handle errors gracefully and provide useful feedback to users.

User Experience

- **Contextual Understanding:** Ensure the AI can understand and respond appropriately to the context of user queries.
- **Accessibility:** Make the chatbot accessible to users with disabilities by following web accessibility guidelines.

Security

- **Data Security:** Protect against data breaches and unauthorized access².
- **Robustness:** Ensure the AI system is resilient against attacks and can handle unexpected inputs

Responsible AI

Generative AI **CAN MAKE MISTAKES** due different causes:

- It relies on publicly available information on the internet, and it may not always be accurate or reliable.
- The data used for training models can inadvertently introduce biases from historical patterns, cultural norms, and societal prejudices.



Copilot always shows the sources used to generate responses.

Review these sources before making decisions or taking actions based on Copilot's responses.

Prompting Exercise



"generate an image of brown Shih-Tzu dog wearing glasses on the theater stage surrounded with various type of animal robots in the hall"

Try it out!



10 Examples prompt to ask about creating a postcard with AI, tailored for Copilot

"Design a postcard featuring a whimsical cityscape with vibrant colors in a watercolor style, including iconic landmarks."

"Create a postcard that captures the tranquil beauty of a beach sunset with minimalistic design and pastel hues."

"Generate a postcard depicting an enchanting forest scene in autumnal colors with woodland creatures and a fairytale ambiance."

"Craft a postcard with a vintage Christmas theme, showcasing a multicultural celebration with festive elements from around the world."

"Compose a postcard that illustrates a whimsical Halloween celebration with a vintage aesthetic and playful but creepy elements."

"Develop a postcard for Thanksgiving that features an autumnal equinox celebration with strong themes of gratitude and mystical fantasy art."

"Produce a postcard that represents a personal memory or dream using AI-generated art for a truly unique touch."

"Conjure a postcard that blends a personal photograph with AI-generated elements to create a one-of-a-kind keepsake."

"Formulate a postcard that reflects the spirit of a birthday celebration with personalized, AI-generated designs."

"Invent a postcard that sends holiday cheer with a magical Christmas scene created by AI."