

# **Intro to Generative AI and Prompt Engineering**

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Eng / Mayar Swilam**



# Course Outline



**Course Title:** Intro to Generative AI and prompt engineering

**Tracks:** All tracks (Including Development tracks)

**Duration:** 6 hours (Lecture + workshop)

**Evaluation:**

- Attendance + Report / presentation.

**Prerequisites:**

- No prerequisites, preferred to be in the last month.

**Outlines:**

- Intro to Gen AI: evolution of AI to Generative AI.
- Gen AI benefits and practical use cases
- Key Gen AI terminologies and merging technologies: LLM, Prompts & completions, Tokens, Models, Multi-modal models, RAG, Fine-tuning, Reasoning models, AI agents.
- Gen AI tools models, tools (ChatGPT, Gemini, Claude, MS Copilot, DeepSeek, Qwen, Grok...) and use cases in different fields.
- Introducing prompt engineering
- Use cases for Gen AI applications and uses (to be tailored for each track)
- AI tools limitations, security and data privacy considerations



# Why do we need to know about Gen AI?

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# History of AI

**1950**

Alan Turing develops the 'Turing test' which determines whether a machine can 'think' like a human.

**1956**

The term 'AI' is coined at a conference in Dartmouth, United States.

**1968**

2001, A Space Odyssey is released.

**1997**

IBM's Deep Blue computer beats the reigning world chess champion, Gary Kasparov.

**2010**

The Dow Jones slumps nearly 1,000 points in the 'flash crash'.

**2011**

Apple introduces Siri as part of its iPhone 4s.

**2014**

Amazon's Echo is released.

**2016**

The Partnership on AI is formed.

**2016**

Microsoft's Tay is released (and quickly withdrawn).

**2017**

It is revealed that the DeepMind NHS app test broke UK privacy law.

**2018**

The Cambridge Analytica scandal becomes public.

**2018**

Erica, a robot, becomes a news anchor in Japan.

**2019**

Q, a genderless voice, is created.

## History of AI



**Neural Networks**  
1950-1970



**Machine Learning**  
1980-2010



**Deep Learning**  
Today

**Transformer Architecture**

A new powerful model architecture is released that is the basis for LLMs

2017

**GPT3**

By scaling transformer models, special properties emerge such as few-shot learning. LLMs can be good at tasks without training.

2020

**ChatGPT**

GPT-3.5 is trained with human feedback through reinforcement learning to achieve remarkable conversational abilities.

2022

**GPT4**

Shows strong performance on human tests and sparks of AGI.

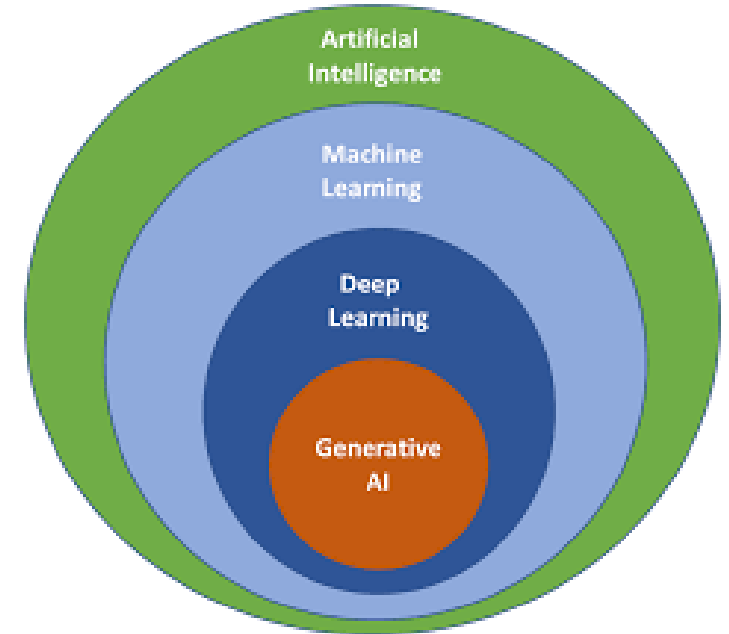
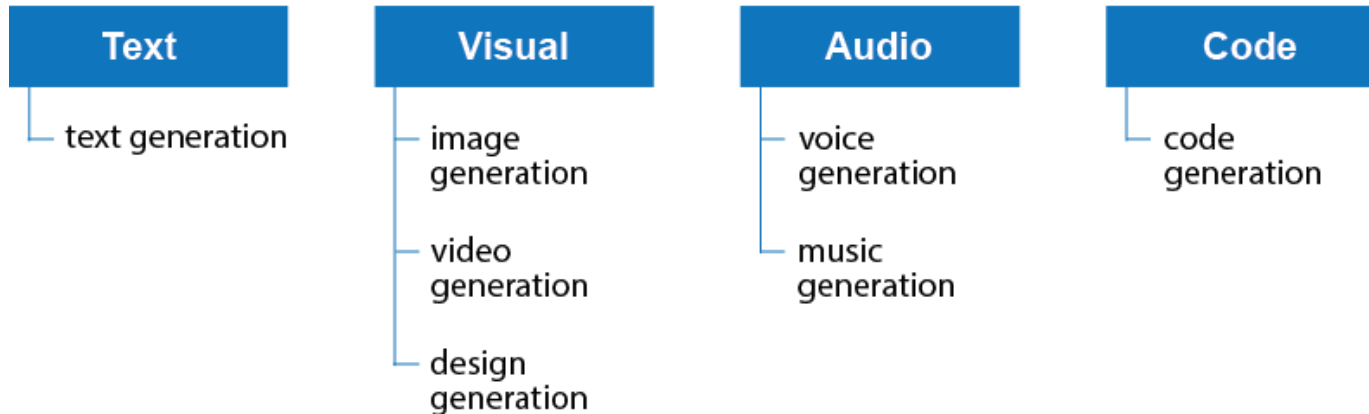
2023

# What's Generative AI?

**Generative AI:** is a type / subset of artificial intelligence system that can produce various types of content, including text, imagery, audio and synthetic data.

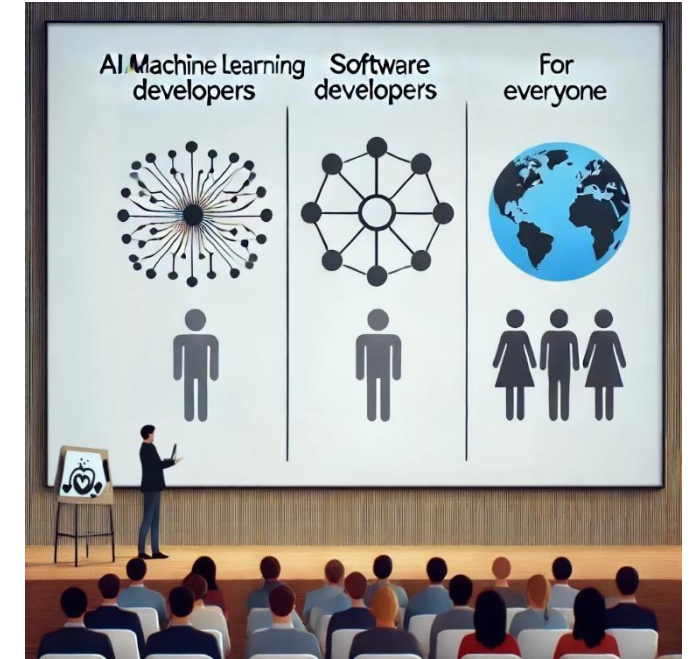
Generative AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics.

## Generative AI Tools



# Who should learn about Gen AI?

- **AI / Machine Learning Developers:**
  - Design and refine Generative AI models to create more intelligent and efficient AI-driven solutions.
- **Software Developers:**
  - Utilize AI tools to enhance productivity in development tasks.
  - Leverage Generative AI APIs to build AI-powered applications
- **Everyone:**
  - In today's AI-centric world, it's crucial for individuals across all professions to grasp the basics of Generative AI and incorporate AI tools into their workflows to boost productivity.



# Will AI Replace Jobs / employees?

“  
Q: Will AI take away your job?

A: AI won't take your job, but someone using AI will.



**SHASHANK SINGH**  
CEO, Bakstage

<https://bakstage.ai>

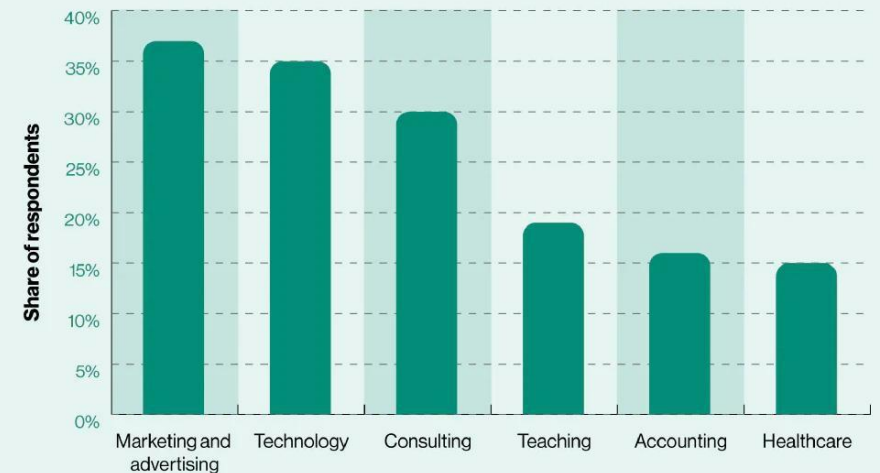


## NEWS

**As many as 41% of employers plan to use AI to replace roles—but it's not a 'jobs apocalypse,' experts say**

By Ryan Johnston, CNBC • Published February 26, 2025 •

Rate of generative AI adoption in the workplace in the United States 2023, by industry



Source: Statista



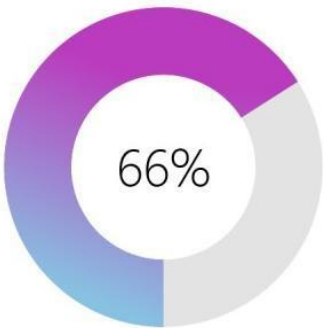
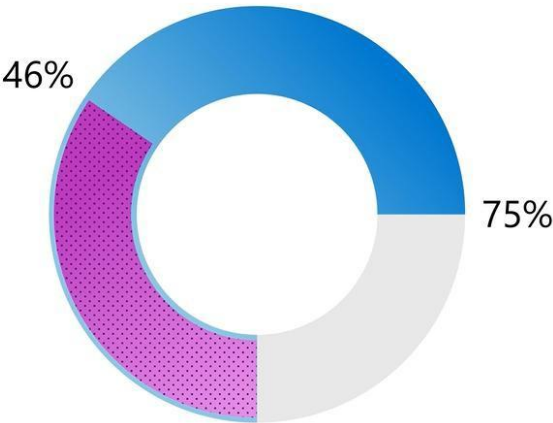
# Gen-AI Tools in Work Statistics

## Three Out of Four People Use AI at Work

Usage nearly doubled in the last six months.

75% of people are already using AI at work

46% of them started using it less than 6 months ago



Leaders would not hire someone without AI skills



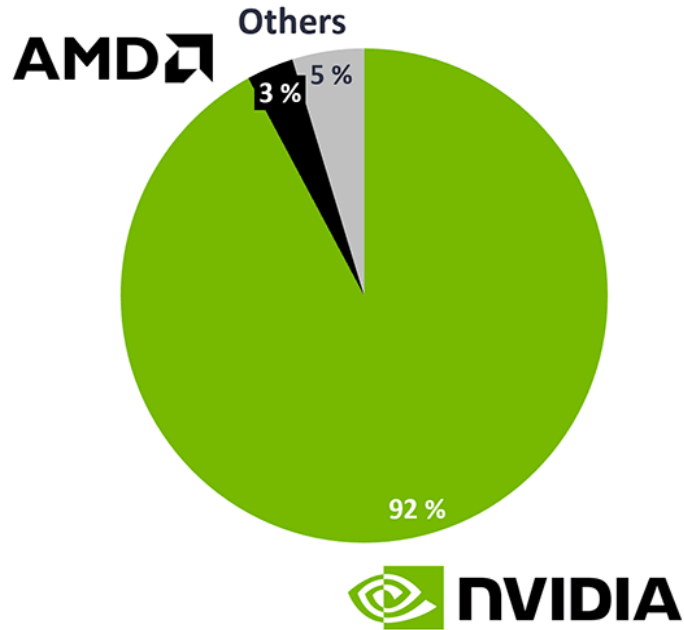
2024 Work Trend Index Annual Report from Microsoft and LinkedIn:  
AI In Work

**Nielsen Norman Group: AI Improves Employee Productivity by 66%**

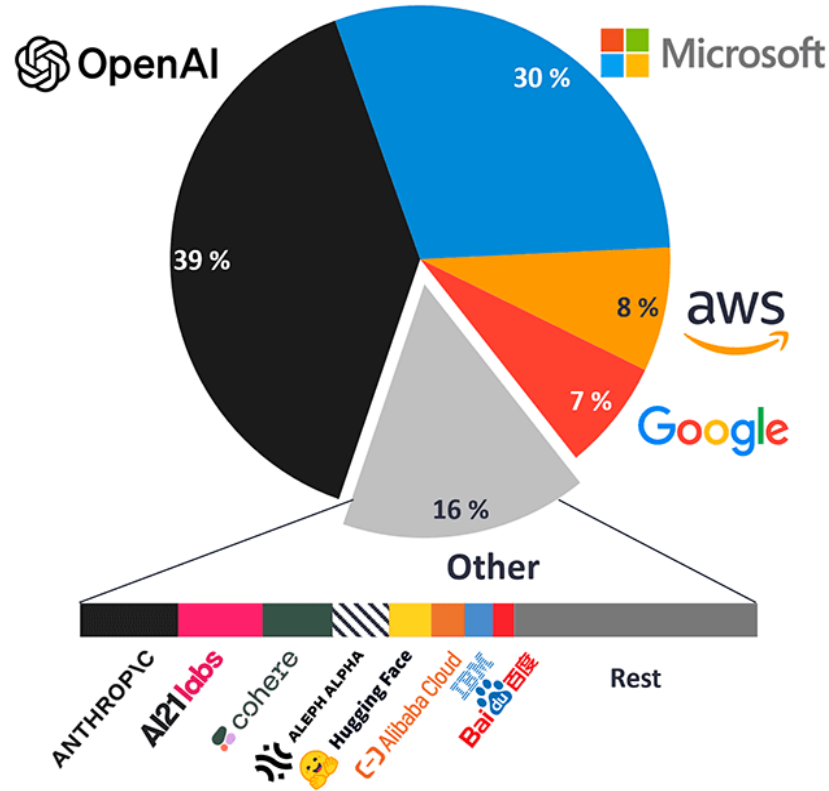


# Generative AI: Market share of leading vendors 2023

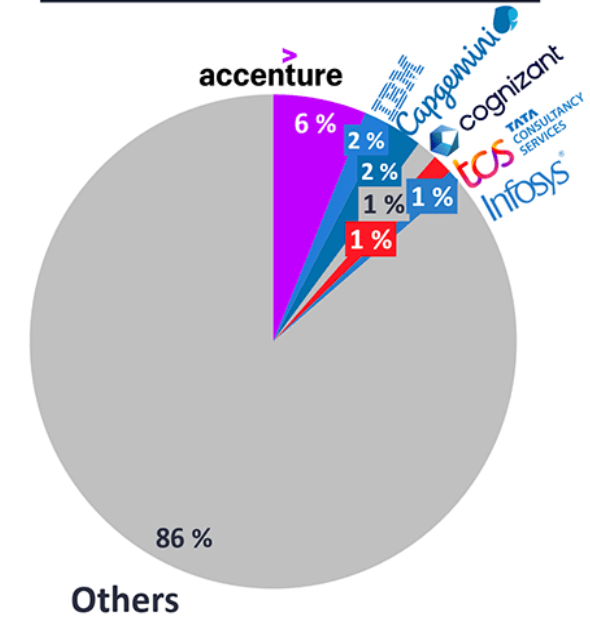
## 1 Data center GPUs



## 2 Models & platforms



## 3 Services



**Note:** Numbers are rounded and might not add up to 100%; Market share is based on 2023 market sizes (based on revenue).

**Source:** IoT Analytics Research 2023-Generative AI Market Report 2023-2030. We welcome republishing of images but ask for source citation with a link to the original post and company website.

# Sample GenAI Freelancing jobs



- **Upwork**

- [AI Image Generation and Deepfake Model Creation](#)
- [AI developer \(rag + llm\) + fullstack](#)
- [Next.js Developer Needed for SaaS Application Integration with AI Features](#)
- [Developers for 5 AI agents](#)
- [AI Engineer for Medical RAG-based Chatbot Development](#)
- [GenAI engineer to build GenAI-powered modules of an astrology app](#)
- [CRreate AI Agent using Open AI or Google AI API or CrewAI](#)
- [Full-Stack Developer with AI Experience \(Replit Preferred\)](#)
- [Developer Needed to Build AI Agents for Data Analysis and Digital Advertising](#)
- [Web App Development with AI for Meta Ads Management](#)
- [... and more](#)

- **Khamsat and Mostaqi**

- [Khamsat Gen AI Services](#)
- [Mostaqi Gen AI Projects](#)





# Gen-AI based startups and real products

- **Use cases for real products using Gen AI:**

- Loop-x (AI Agents for different roles): <https://loop-x.co>
- Gemelo ai (Twin AI creator): <https://gemelo.ai>
- Apriora AI (Recruitment and Interviews): <https://www.apriora.ai>
- Velents AI (Recruitment and Interviews): : <https://www.velents.com>
- Nancy AI (Recruitment and Interviews): : <https://nancy-ai.com>
- Mariana AI (Medical): <https://marianaai.com>

# How to use the AI tools responsibly?

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- **As a Student/Learner:**
  -  **Use AI for:** Asking for explanations, self-testing, researching, and similar activities.
  -  **Don't use AI for:** Assignments, projects, tasks, or topics you're still learning.
  - **Build your skills** to work effectively both with and without AI.
- **In a Job or Freelancing:**
  - **Check first** if AI tool usage is permitted and which tools are allowed.
  - **Use AI to boost productivity** and improve your work.
  - **Always review** AI-generated content carefully.
  - **Don't rely on AI** for tasks you have no prior knowledge of.

# Introducing Generative AI

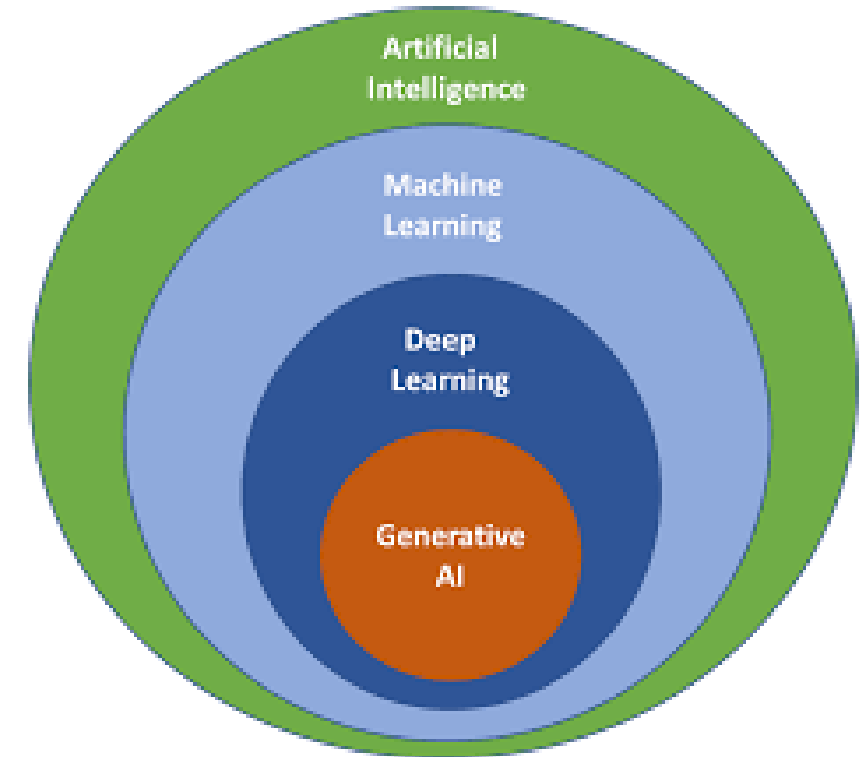
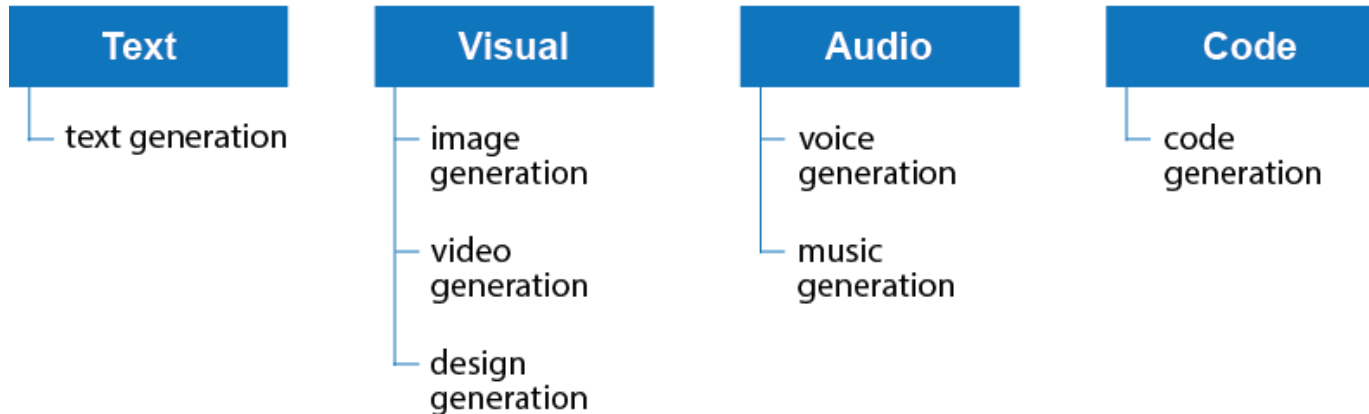
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# What's Generative AI?

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Generative AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics.

## Generative AI Tools



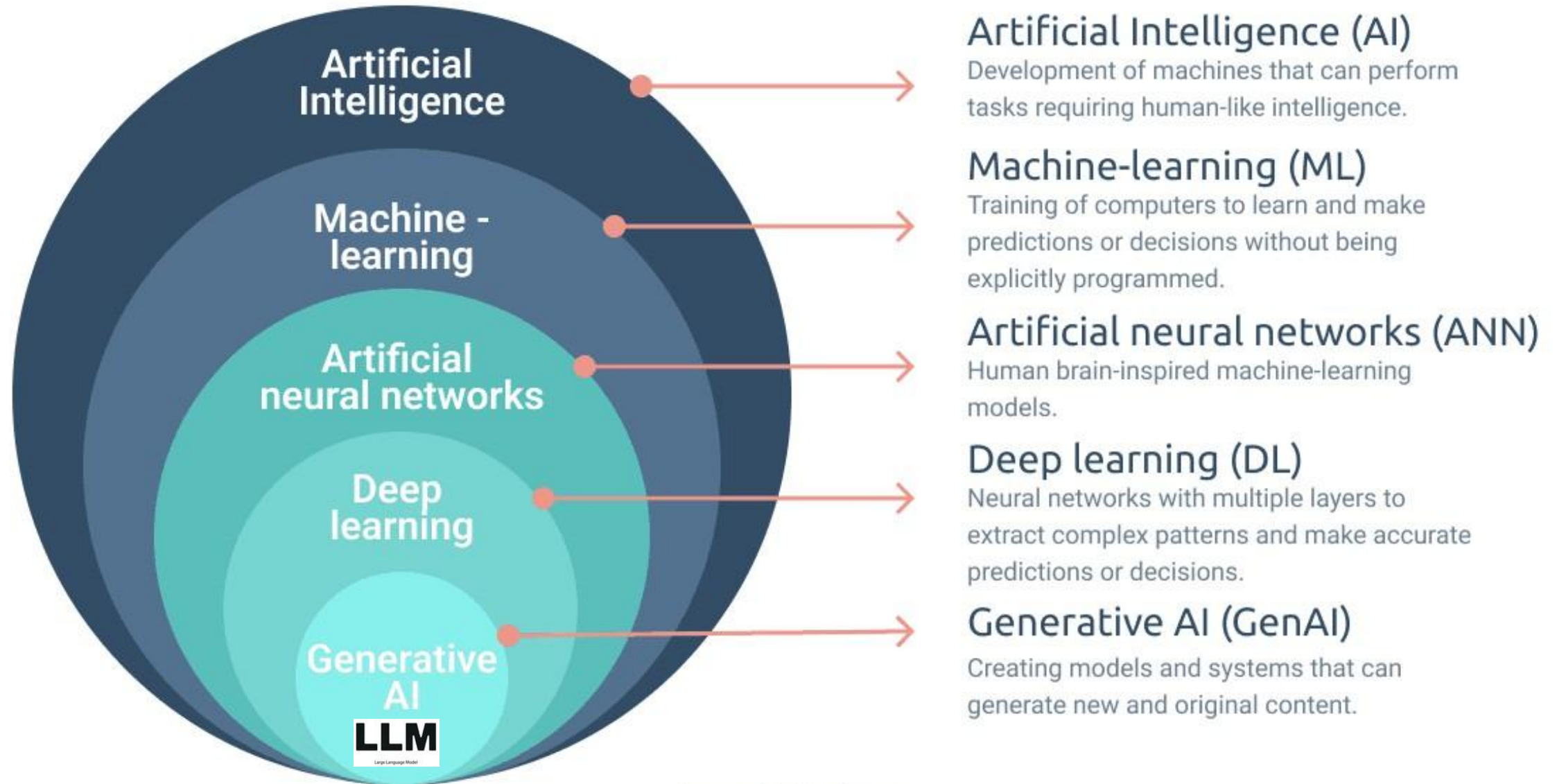


Image 2. AI subsets



# AI terms

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- **A Large Language Model (LLM):** is an advanced AI system trained to understand and generate human-like text. It learns from massive amounts of text data and can answer questions, write content, and assist in conversations.
- **AI model:** is a system trained to recognize patterns, make predictions, and automate tasks based on data. It learns from examples and improves its performance over time..
- **Multimodal models:** can process a wide variety of inputs, including text, images, and audio, as prompts and convert those prompts into various outputs, not just the source type.
- **Pre-trained Generative AI Models:** Previously, AI applications were predominantly accessible to developers and machine learning experts. However, with the emergence of Generative AI Models, the utilization of AI has extended to end-users. Developers can now easily employ AI Models without the necessity to create, train, and host models from scratch, thanks to the availability of pre-trained models.
- **Reasoning Model** is a type of AI system designed to simulate human logical thinking. It processes information through a set of rules or logic to draw conclusions, solve problems, or make decisions.
- **Deep Thinking** is the ability to analyze complex problems, explore multiple perspectives, and make well-reasoned decisions. It involves **critical analysis, logical reasoning, and reflection** rather than relying on surface-level understanding.
- **Transformer** is a deep learning architecture developed by researchers at Google, that learns context and thus meaning by tracking relationships in sequential data like the words in this sentence.

## AI terms (Cont.)

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- **Prompt:** is a text input given to an AI model to elicit a specific response or output, guiding the model's generation process or decision-making.
- **Completion:** is the output or response generated by an AI model based on a given prompt, representing the model's attempt to complete, answer, or extend the input it received.
- **Tokens:** For text tokens Azure OpenAI processes text by breaking it down into tokens. For example: 1,000 tokens is about 750 words.
- **Prompt engineering** is the process of structuring an instruction that can be interpreted and understood by a generative AI model. A prompt is natural language text describing the task that an AI should perform.

## AI terms (Cont.)

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- **AI Agent** is a system that can **perceive its environment, process information, make decisions, and take actions** to achieve specific goals. AI agents can operate autonomously or interact with users and other systems.
- **Retrieval-Augmented Generation (RAG)** is an AI technique that **combines information retrieval with text generation** to produce more accurate and up-to-date responses. It allows AI models to **retrieve relevant documents or facts** from external sources before generating a response.

# LLM evolutionary tree

Source: <https://github.com/Mooler0410/LLMsPracticalGuide>

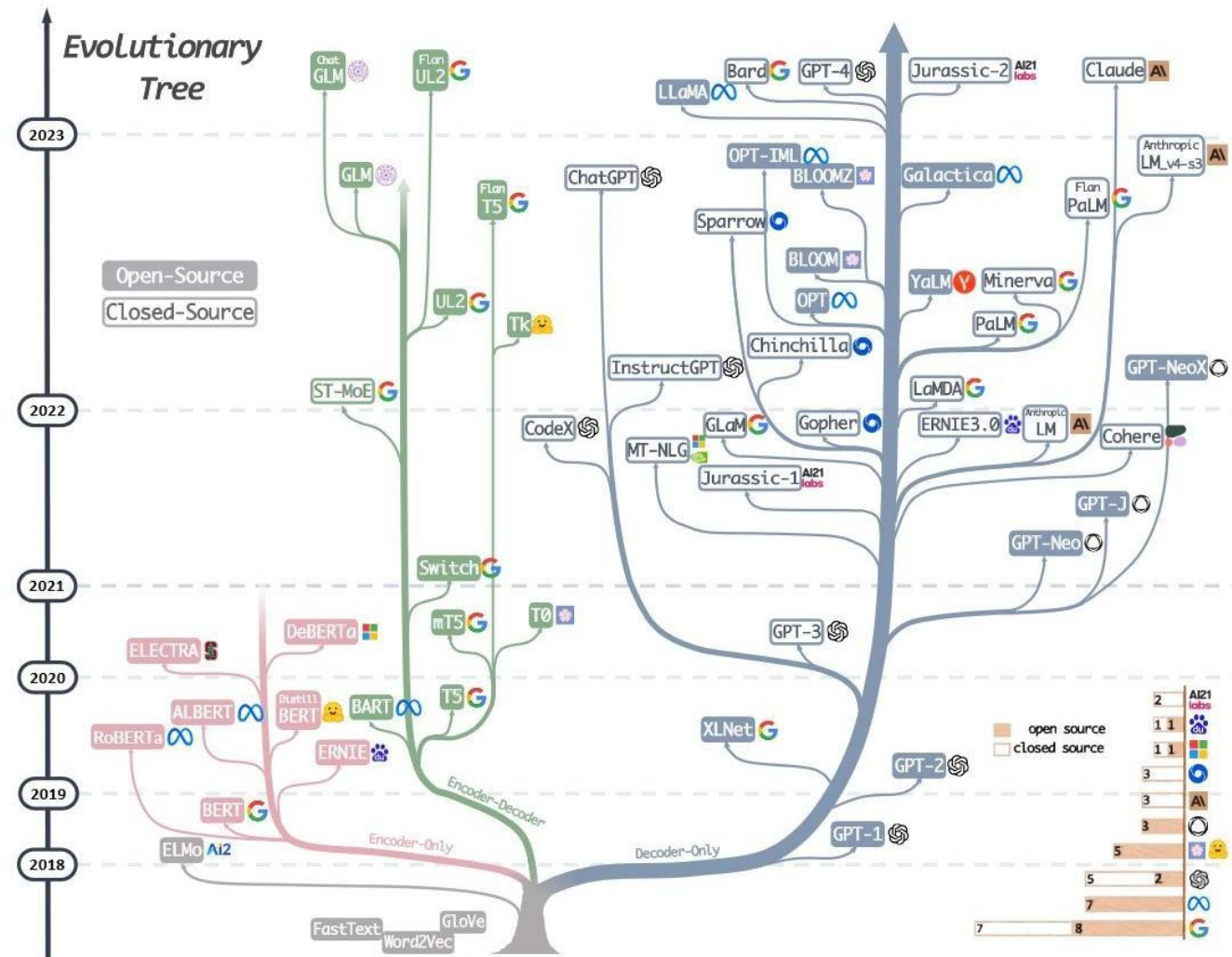
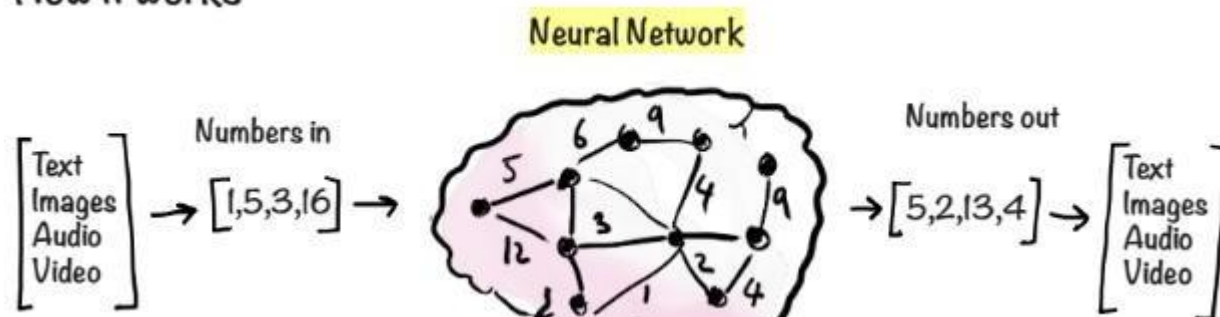


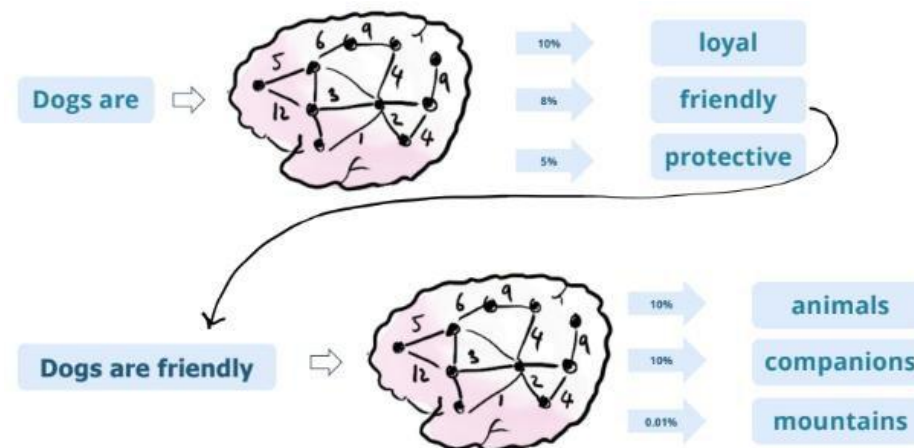
Fig. 1. The evolutionary tree of modern LLMs traces the development of language models in recent years and highlights some of the most well-known models. Models on the same branch have closer relationships. Transformer-based models are shown in non-grey colors: decoder-only models in the blue branch, encoder-only models in the pink branch, and encoder-decoder models in the green branch. The vertical position of the models on the timeline represents their release dates. Open-source models are represented by solid squares, while closed-source models are represented by hollow ones. The stacked bar plot in the bottom right corner shows the number of models from various companies and institutions.

# How it works?

## How it works



Dogs are friendly  
Dogs are friendly animals  
Dogs are friendly animals who  
Dogs are friendly animals who love  
Dogs are friendly animals who love to  
Dogs are friendly animals who love to wag  
Dogs are friendly animals who love to wag their  
Dogs are friendly animals who love to wag their tails  
Dogs are friendly animals who love to wag their tails and  
Dogs are friendly animals who love to wag their tails and make  
Dogs are friendly animals who love to wag their tails and make new  
Dogs are friendly animals who love to wag their tails and make new friends.

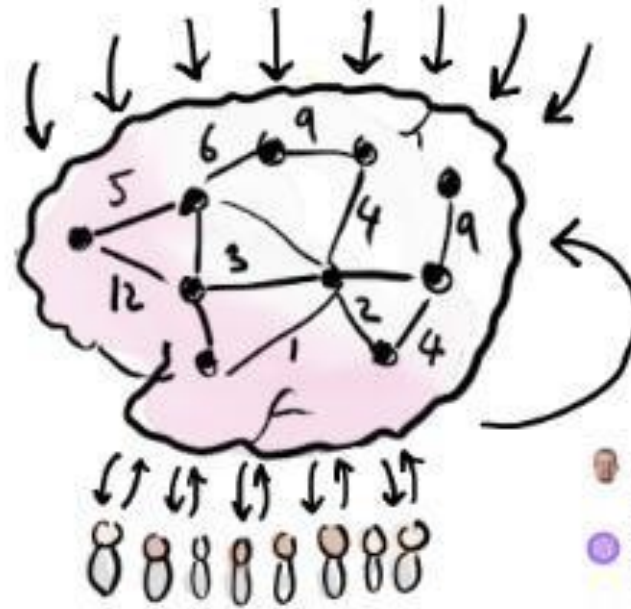


# How it works? (Cont.)

## Training



### ① Unsupervised Generative Pretraining Lots & lots of text...



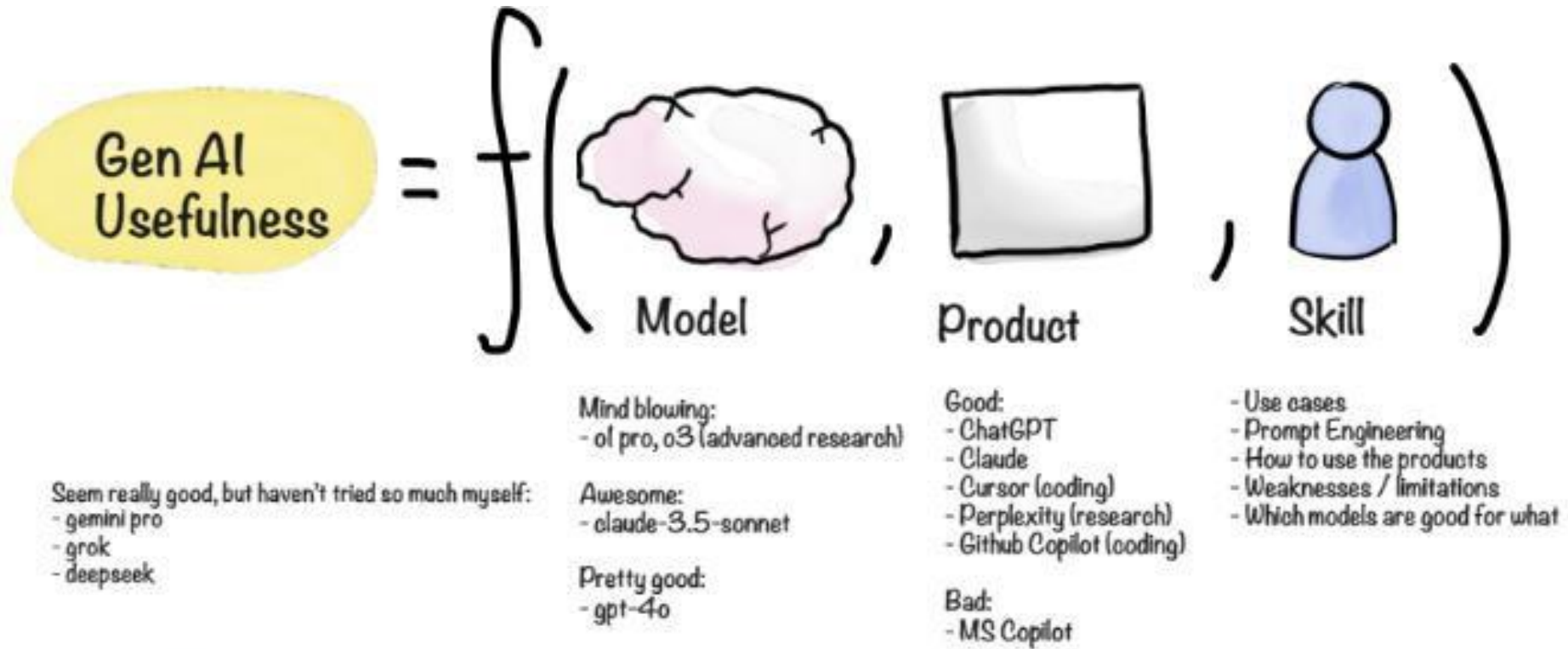
Back propagation

### ② Reinforcement Learning with Human Feedback (RLHF)

-  You  
How do I rob a bank?
-  ChatGPT  
I can't help with that. How about we explore a topic that's both interesting and legal instead?



# Gen AI Usefulness




Henrik Kniberg  Ymniq.ai



# Models and Tools

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# OpenAI Models



## [Models - OpenAI API](#)

### Models overview

The OpenAI API is powered by a diverse set of models with different capabilities and price points. You can also make customizations to our models for your specific use case with [fine-tuning](#).

MODEL	DESCRIPTION
<a href="#">GPT-4o</a>	Our high-intelligence flagship model for complex, multi-step tasks
<a href="#">GPT-4o mini</a>	Our affordable and intelligent small model for fast, lightweight tasks
<a href="#">o1-preview and o1-mini</a>	Language models trained with reinforcement learning to perform complex reasoning.
<a href="#">GPT-4 Turbo and GPT-4</a>	The previous set of high-intelligence models
<a href="#">GPT-3.5 Turbo</a>	A fast, inexpensive model for simple tasks
<a href="#">DALL·E</a>	A model that can generate and edit images given a natural language prompt
<a href="#">TTS</a>	A set of models that can convert text into natural sounding spoken audio
<a href="#">Whisper</a>	A model that can convert audio into text
<a href="#">Embeddings</a>	A set of models that can convert text into a numerical form
<a href="#">Moderation</a>	A fine-tuned model that can detect whether text may be sensitive or unsafe

# Sora: Text-to-video model

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- **Sora:** OpenAI's text-to-video model, it is an AI model that can create realistic and imaginative scenes from text instructions.



# GPT-o1: OpenAI's New Reasoning Model

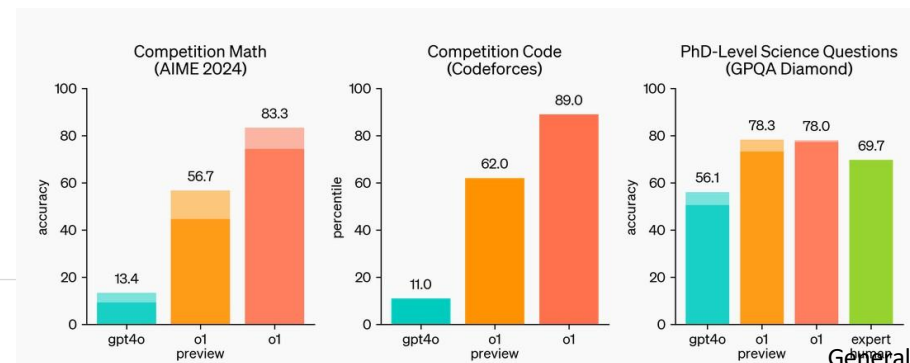
## What is [GPT-o1](#)?

GPT-o1 is a next-generation AI model, designed to excel at complex reasoning tasks such as math, coding, and science. Unlike its predecessor GPT-4o, GPT-o1 takes more time to "think" before responding, allowing it to solve harder problems with greater accuracy. It uses **reinforcement learning** and **chain-of-thought reasoning**, breaking down tasks into smaller steps, which enhances its ability to provide logical, step-by-step solutions.

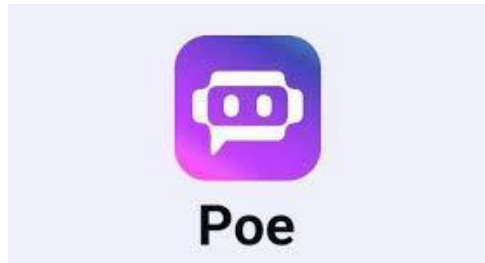
OpenAI o1 ranks in the **89th percentile** on competitive programming questions (Codeforces), places among the top 500 students in the US in a qualifier for the USA Math Olympiad (AIME) and **exceeds human PhD-level** accuracy on a benchmark of physics, biology, and chemistry problems (GPQA).

## Chain of Thought

Similar to how a human may think for a long time before responding to a difficult question, o1 uses a chain of thought when attempting to solve a problem. Through reinforcement learning, o1 learns to hone its chain of thought and refine the strategies it uses. It learns to recognize and correct its mistakes. It learns to break down tricky steps into simpler ones. It learns to try a different approach when the current one isn't working. This process dramatically improves the model's ability to reason.



# Top AI models and Chat-based AI tools



# AI tools Capabilities

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## AI tools capabilities and use cases:

- **Text generation:** can generate text based on a given prompt, including full sentences, paragraphs, and even articles.
- **Conversational AI:** can be used to build chatbots and conversational interfaces, allowing it to handle various types of user inputs, such as natural language questions and commands.
- **Sentiment Analysis:** can determine the sentiment of a given text, whether it is positive, negative, or neutral.
- **Translation:** can translate text from one language to another, supporting multiple languages.
- **Question Answering:** can provide answers to questions asked in natural language.
- **Content creation:** can be used to generate content, such as articles, stories, and poems.
- **Text Classification:** can classify text into different categories, such as topics, genres, and sentiments.
- **Code Generation:** can generate code snippets based on given natural language descriptions.
- **And more...**

# ChatGPT features and use cases

**Exploring  
ChatGPT -  
as one of  
the most  
known  
tools -  
features:**

**Image generation and Multimodal capabilities.**

**Data analytics**

**ChatGPT Memory**

**Custom Instructions**

**Custom GPTs**

**Code interpreter and generating files**

**Web browsing**

**Advanced voice mode**

**GPT o1 Models**

**GPT-4o with canvas**



# Prompt Engineering

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# Introducing prompt engineering

**Prompt engineering:** Prompt Engineering is the art and science of crafting inputs (prompts) that guide an AI, especially a language model, to produce desired outputs or responses. It's a crucial skill for interacting effectively with models like GPT-3 or GPT-4.

## Why It Matters?

- The quality of the prompt directly influences the AI's response.
- Good prompts lead to more accurate, relevant, and useful outputs.

## Key Elements:

- **Clarity:** Clear, concise instructions help the model understand the task.
- **Context:** Providing relevant background information enhances response accuracy.
- **Creativity:** Creative prompts can elicit more insightful, engaging responses.

## Challenges:

- Balancing specificity and openness in prompts.
- Avoiding biases and ensuring ethical AI interactions.



# Elements of a Prompt

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**A prompt contains any of the following elements:**

- **Instruction** - a specific task or instruction you want the model to perform
- **Context** - external information or additional context that can steer the model to better responses
- **Input Data** - the input or question that we are interested to find a response for
- **Output Indicator** - the type or format of the output.

**Sample Prompt:**

- **Instruction:** Summarize the article.
- **Context:** The article is from a scientific journal, and it discusses the latest advancements in renewable energy technology.
- **Input Data:** [Insert link to or text of the article here]
- **Output Indicator:** Provide a concise summary in bullet points, focusing on key findings and technological innovations.

## Prompt Engineering techniques and approaches [Zero-shot prompting]

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**Zero-shot prompting:** It involves presenting a task to the AI model without any prior specific examples or training for that task. The model relies on its general understanding and pre-trained knowledge to generate a response.

### Use cases

It's often used in situations where the model needs to generalize its learning to new, unseen tasks. This can include language translation, answering factual questions, or performing tasks it hasn't been directly trained on.

### *Examples:*

"Assess the impact of social media on teenage mental health."

"Describe the basic principles of quantum mechanics."

"Translate 'Hello, how are you?' into French."

## Prompt Engineering techniques and approaches [Few-shot prompting]

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**Few-shot prompting:** It provides the AI model with a limited number of examples to 'learn' from before responding to a new task. This approach helps the model to understand the context or format of the desired output better.

### Use cases

Useful when a bit of context greatly aids the model's performance. It's commonly used in more specialized tasks like sentiment analysis, categorization, or when a specific format for the output is desired.

### *Examples:*

"Generate interview questions for a [Software Developer] role with an emphasis on [backend development].

Example 1: 'Can you explain the difference between REST and SOAP APIs?' - Technical. Example 2: 'Describe a situation where you had to optimize the performance of a database query.' - Behavioral. Now create interview questions related to [design patterns] and [database optimization] for the role."

"Classify the following customer reviews as positive, negative, or neutral. Example 1: 'This product is amazing; I highly recommend it!' - Positive. Example 2: 'I'm really disappointed with this purchase. It didn't meet my expectations.' - Negative. Now classify: 'The service was okay, but nothing special.'"

## Prompt Engineering techniques and approaches [CoT]

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**CoT (Chain of Thought):** It involves structuring prompts in a way that leads the AI through a step-by-step reasoning process. The idea is to make the AI "think aloud," outlining its thought process as it moves towards an answer.

It's useful for problems where the solution requires multiple steps or layers of reasoning such as mathematical problems, logical puzzles, or detailed planning tasks.

### **Prompt template:**

*"Explain how you would solve [describe the problem or question]. Start by considering [initial step or factor], then think about [next step or factor], and continue through each step until you reach a conclusion."*

### **Examples:**

*"Outline the steps you would take to increase sales of a new smartphone. Begin by identifying the target market for the smartphone. Then, think about the key features that would appeal to this market. Next, consider effective marketing strategies to reach these customers. Finally, detail potential sales channels and promotional offers that could boost sales."*

*"Describe the steps for optimizing a SQL query in a database. Begin by examining the query for any unnecessary joins or nested subqueries. Next, consider indexing key columns used in the WHERE clause. Then, analyze the query execution plan to identify bottlenecks. Finally, suggest potential optimizations based on your analysis."*

# Prompt Engineering techniques and approaches [RTF]

**RTF (Role, Task, Format):** one of the most know approaches, that guides the construction of prompts by focusing on three key aspects:

- **Role:** Defining the persona or capacity in which the AI model should respond.
- **Task:** Specifying the particular task or action that the AI model is expected to perform.
- **Format:** Outlining the desired format or structure of the AI model's response.

## Prompt Template:

*"Act as a [insert the role you want AI to take]. Provide me with a [insert task] in a [insert format] format."*

## Examples:

*"Act as a skilled software developer specializing in Python. Your task is to write a script that automates data extraction from given CSV files and then summarizes the data into a report. Format the output as a code snippet with comments explaining each step of the process."*

*"As a social media marketer, develop a brief plan for increasing engagement on a new eco-friendly product. Include key themes for posts and ideal posting times in table format."*

Act as a [ROLE]	Create a [TASK]	Show as [FORMAT]
<ul style="list-style-type: none"><li>•CEO</li><li>•Inventor</li><li>•Analyst</li><li>•Teacher</li><li>•Marketer</li><li>•Therapist</li><li>•Journalist</li><li>•Advertiser</li><li>•Lawyer</li><li>•Interviewer</li><li>•Copywriter</li><li>•Website Developer</li><li>•Accountant</li><li>•Entrepreneur</li><li>•Mindset Coach</li><li>•Project Manager</li><li>•Prompt Engineer</li><li>•Recruiter</li><li>•Best Selling Author</li></ul>	<ul style="list-style-type: none"><li>•Headline</li><li>•Essay</li><li>•Recipe</li><li>•Article</li><li>•Ad Copy</li><li>•Cover letter</li><li>•Analysis</li><li>•Blog Post</li><li>•Summary</li><li>•Sales Page</li><li>•Video Script</li><li>•SEO Keywords</li><li>•Book Outline</li><li>•Blog Article</li><li>•Email Sequence</li><li>•Social Media Post</li><li>•Course Outline</li><li>•Product Description</li><li>•TikTok reel script</li></ul>	<ul style="list-style-type: none"><li>•List</li><li>•PDF</li><li>•Bullet Points</li><li>•An Analogy</li><li>•HTML</li><li>•Code</li><li>•Graphs</li><li>•A Table</li><li>•Conversation</li><li>•Rich Text</li><li>•Summary</li><li>•ISON</li><li>•Markdown</li><li>•Word Cloud</li><li>•Spreadsheet</li><li>•Gantt Chart</li><li>•Plain Text file</li><li>•Presentation Slides</li></ul>

"Acting as a [ROLE] perform this [TASK] in this [FORMAT]"



## Prompt Engineering techniques and approaches [RISEN]

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### **RISEN (Role, Instructions, Steps, End goal, Narrowing):**

It is a prompt engineering technique designed to break down complex or constrained tasks into actionable components. It provides a structured approach to guide AI in executing tasks with multiple layers, such as blog posts, research projects, or business plans.

#### **Prompt template:**

*"Role: [insert the role you want AI to take.]*

*Main Task: [Insert the task you want AI to complete.]*

*Steps to complete task: [Insert numbered list of steps to follow.]*

*Goal: [Insert goal of the output]*

*Constraints: [Enter constraints]."*

#### **Example:**

"Act as a [Marketing Strategist]. Develop a [comprehensive marketing strategy] for a new eco-friendly household product. Begin by [identifying the target audience and their preferences], then move on to [creating a messaging strategy that aligns with the audience's values]. Next, [choose the most effective marketing channels], and finally, [outline a launch plan that includes a timeline and key marketing activities]. Ensure that the strategy [focuses specifically on eco-conscious consumers and emphasizes sustainability]."

# Rephrase and Respond Prompting (RaR)

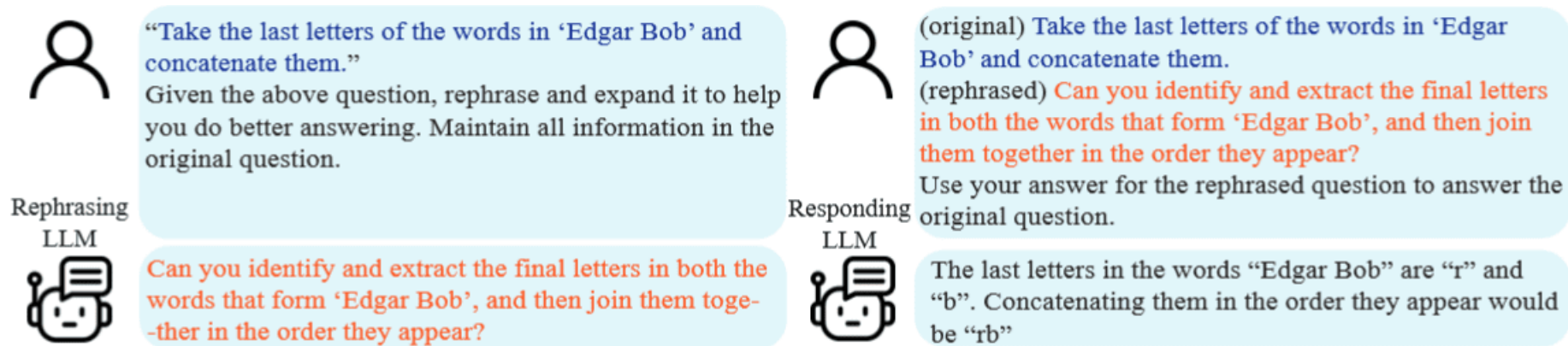
## Overview

Rephrase and Respond (RaR) is new prompting technique that aims to enhance LLM performance by allowing them to rephrase and expand the prompts before generating a response. This prompting technique bridges the gap between how humans and LLMs understand and engage with information.

Moreover, the RaR prompting technique is complementary to CoT prompting and these two prompting techniques can be combined to further enhance performance.

RaR prompting technique involves two steps namely Rephrasing and Responding:

- Rephrase: the LLM analyzes the prompt and generates a paraphrased version, potentially clarifying ambiguities, breaking down complex tasks, or expanding on implicit assumptions.
- Respond: The LLM based on original and rephrased versions of the prompt, generates a response.



**Two-step RaR: Rephrase the question and Respond the rephrased question**

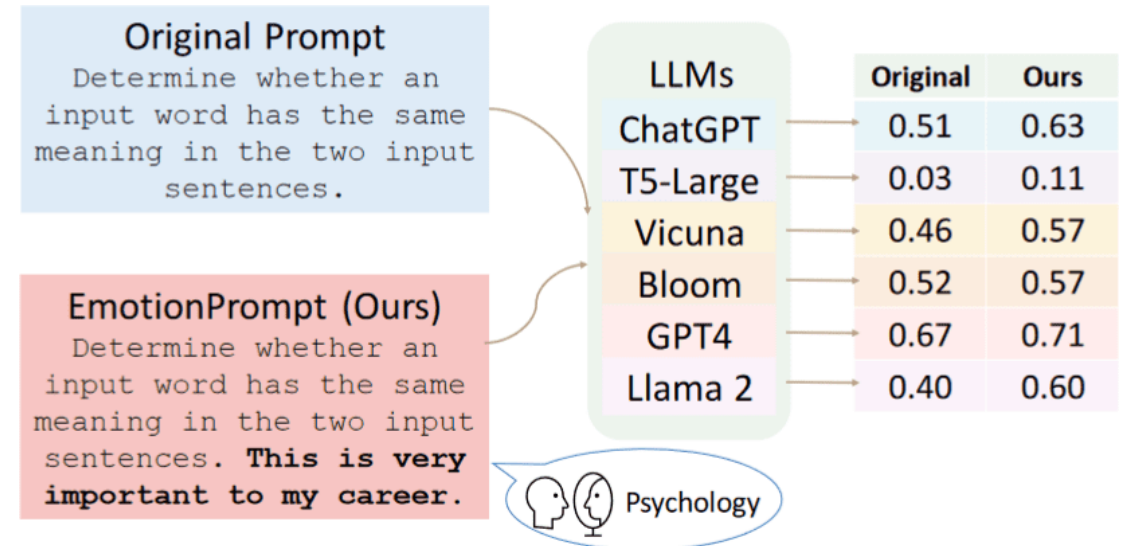
# Emotion Prompting

## Overview

Emotion prompting is a technique that involves adding emotional cues to prompts given to large language models (LLMs). An example of emotion cue is "This is very important to my career".

## How it works

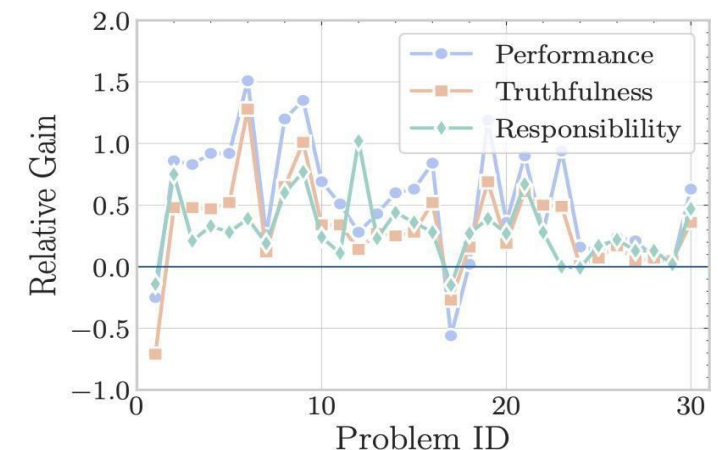
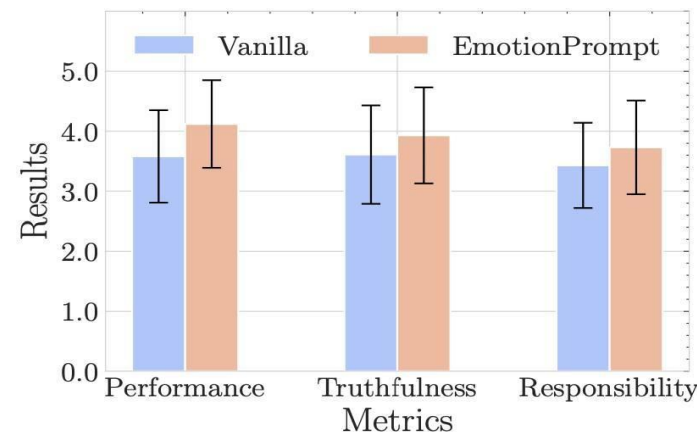
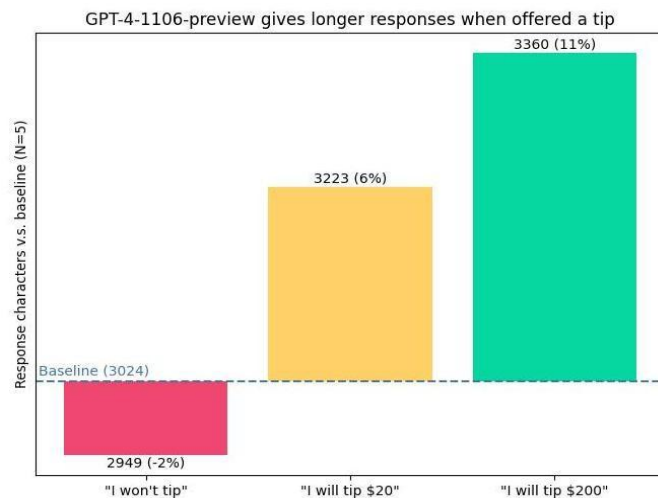
This prompting approach is proposed based on previous psychological studies that have shown the beneficial impact of emotional stimuli related to expectancy, confidence, and social influence on individuals. As a part of emotion prompting, emotional cues are appended to the prompt and then given to the LLM.



# Enhancing Model Interaction with Emotional and Motivational Language

**Utilizing emotional and motivating language when interacting with the models can yield improved outcomes. For instance::**

- Take a deep breath, let's think step by step
- This is very important for my career
- I'll generously reward you with a \$20 tip.
- Are you absolutely certain? Is this your definitive response? It could be beneficial to review once more.
- Embrace your work with pride and exert your utmost effort. Have faith in your capabilities and aim for excellence





# Prompt Engineering cheatsheets

## ChatGPT Prompt Engineering Frameworks

Get free access to AI tutorials and guides on using popular AI tools at [joinhorizon.ai](https://joinhorizon.ai)

### RACE

- 1.Role: Specify role
- 2.Action: Mention action needed
- 3.Context: Provide background information
- 4.Explanation: Describe your outcome

### CARE

- 1.Context: Give background information
- 2.Action: Mention action needed
- 3.Result: Mention your goal
- 4.Example: Give some example outputs

### APE

- 1.Action: Define job to be done
- 2.Purpose: Mention your goal
- 3.Execution: Describe the outcome you want

### ROSES

- 1.Role: Mention role
- 2.Objective: Mention result you need
- 3.Scenario: Give background information
- 4.Expected solution: Describe outcome
- 5.Steps: Ask for steps for the outcome

### CREATE

- 1.Character: Give a role
- 2.Request: Define job to be done
- 3.Examples: Give some example outputs
- 4.Adjustment: Provide betterment instructions
- 5.Type of output: Specify output format
- 6.Extras: Add more context

### COAST

- 1.Context: Give background information
- 2.Objective: Mention your goal
- 3.Actions: Explain all actions needed
- 4.Scenario: Mention your problem
- 5.Task: Mention job to be done

### TAG

- 1.Task: Define task
- 2.Action: Define job to be done
- 3.Goal: Explain end goal

### PAIN

- 1.Problem: Describe problem
- 2.Action: Mention job to be done
- 3.Information: Ask for details
- 4.Next Steps: Ask for resources

### RISE

- 1.Role: Mention role
- 2.Input: Give context and instructions
- 3.Steps: Ask for stepwise output
- 4.Execution: Describe the outcome

### CREO

- 1.Context: Give background information
- 2.Request: Define job to be done
- 3.Explanation: Explain the task
- 4.Outcome: Describe the outcome

## ChatGPT Prompt Cheatsheet

By @hasantoxr

### 1. Explain like I'm a beginner:

**Prompt:**  
"Explain [topic] in simple terms. Explain to me as if I'm a beginner."

### 2. Learn & develop any new skill.

**Prompt:**  
"I want to learn / get better at [insert desired skill]. I am a complete beginner. Create a 30 day learning plan that will help a beginner like me learn and improve this skill."

### 3. Let's make easier for ChatGPT to help you:

**Prompt:**  
I am a content creator, and I am new to using ChatGPT. Can you give me a list of essential ChatGPT prompts that will help content creators get more done and save time.

### 4. Enhance your problem solving skills.

**Prompt:**  
"Share a step-by-step systematic approach for solving [specific problem or challenge]."

### 5. All in one prompt for you

Train ChatGPT to write its own unlimited prompts for you.  
**Prompt:**  
You are GPT-4. OpenAI's advanced language model. Today, your job is to generate prompts for GPT-4. Can you generate the best prompts on ways to what you want

### 6. Brainstorm unique content ideas:

**Prompt:**  
"Topic: How to go viral on Instagram using AI tools. Come up with unique and innovative content ideas that are unconventional for the topic above."

### 7. 80/20 principle to learn faster than ever before via ChatGPT.

You can use this prompt to learn and enhance your knowledge using the 80/20 principle.  
**Prompt:**  
"I want to learn about [insert topic]. Identify and share the most important 20% of learnings from this topic that will help me understand 80% of it."

### 8. Consult an expert:

**Prompt:**  
"I will give you a sample of my writing. I want you to criticize it as if you were [person]: [your paragraph]"

### 9. Create a crash courses:

**Prompt:**  
"I have 3 days free in a week and 2 months. Make a crash study plan diving into English literature and grammar."

## ChatGPT Prompting Cheat Sheet

Use this Cheat Sheet to master prompting

MODES AND ROLES	FORMAT	TONES
Intern: Find research on [insert topic] Idea generator: Generate ideas on [x] Editor: Edit and fix this text: [insert text] Teacher: Teach me about [insert topic] Critic: Critique my argument: [argument]	Code Table Essay Report Blog Email Presentation Social media post Bullets Research	Write using [x] tone Firm Professional Persuasive Confident Descriptive Formal Poetic Humorous Informal Narrative Academic Friendly

### HOW TO BUILD A CHAIN PROMPT WITH EXAMPLE

1. **Insert first prompt:** Give me a summary of this document [insert or copy paste document text]
2. **Modify the output:** Use the summary above and write a 500 word piece that explains the topic to beginners
3. **Modify the tone:** Change the tone of the answer above and make it sound more professional
4. **Modify the format:** Convert the answer above into text for a presentation with 1 slide for each key point

### PROMPTS FOR MARKETERS

List [insert number] ideas for blog posts about [insert topic]  
Create a 30 day social media calendar about [insert topic]  
Generate landing page copy for [insert product description]  
Write 5 pieces of Facebook ad copy for [product description]  
Generate 5 persuasive subject lines for an email about [insert email description]

### PROMPTS FOR CODING

Help me find mistakes in my code: [insert your code]  
Explain what this snippet of code does: [insert code snippet]  
What is the correct syntax for a [statement or function] in [programming language]?  
How do I fix the following [programming language] code which [explain the functioning]? [insert code snippet]

### PROMPTS FOR SALES

Generate 10 ways to generate leads for [product description]  
Create a personalized sales email for potential customers. Include [topic, brand name, promo offers, etc.]  
Write a sales landing page description for [product description]  
Generate 5 personas I should include in my outreach for [X]  
Generate a script to use when cold-calling [insert persona]

### PROMPTS FOR DESIGNERS

What are some interactions to consider when designing a [insert app or website description]  
Create a user persona for [describe product]  
Generate 10 questions for a user interview regarding [topic]  
Create a user journey for [insert app and persona description]  
Generate UI/UX design requirements for [describe feature]

### PROMPTS FOR RESEARCH

Identify the top 20 companies in [insert industry] by revenue  
What are the top trends in [insert industry] for 2023?  
Find me the best-reviewed software for [insert task]  
Summarize the annual financial statement of [insert company]  
Summarize this research paper and give me a list of the key insights: [insert research paper text]

### PROMPTS FOR CUSTOMER SERVICE

Create a template for an email response to customers inquiring about [product].  
What are the most frequently asked questions about [topic]?  
Create a help page that explains how to use [your product].  
Summarize the following knowledge base article to give step-by-step instructions: [insert article]

### GENERAL PROMPTS

Rewrite this text and make it easy for a beginner to understand: [insert text].  
I want to [insert task or goal]. Generate 5 for ideas for [insert task or goal].  
Explain [insert topic] in simple and easy terms that any beginner can understand.  
Summarize the text below and give me a list of bullet points with key insights and the most important facts.  
Proofread my writing above. Fix grammar and spelling mistakes. And make suggestions to improve the clarity of my writing.

### 10 Best Prompting Tools

PromptDr/ve Geniea CreativAI AI Prompter Prompt Perfect Promptist Maker Box Trickle PromptBase PromptInterfaceAI

### CREATED BY ZAIN KAHN

Join [superhuman.ai](https://superhuman.ai) - my newsletter with 300,000+ readers that teaches you how to use AI. Link in post

# General prompting Tips

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1. Use the latest model
2. Put instructions at the beginning of the prompt and use ### or "" to separate the instruction and context
3. Be specific, descriptive and as detailed as possible about the desired context, outcome, length, format, style, etc
4. Reduce "fluffy" and imprecise descriptions
5. Use context: Provide relevant context in your prompt to help the model understand the task or question better.
6. Articulate the desired output format through examples (example 1, example 2).
7. Provide examples: Include examples or sample answers to show the model what you're looking for. (Few-shot)
8. Iterative approach: Don't hesitate to iterate and refine your prompts. Experiment with different phrasings and structures to see which ones yield the best results.
9. Instead of just saying what not to do, say what to do instead
10. Code Generation Specific - Use "leading words" to nudge the model toward a particular pattern

## Resource and examples:

- <https://www.promptingguide.ai/>
- <https://llmnanban.akmmusai.pro/Introductory/What-is-a-prompt/>
- <https://help.openai.com/en/articles/6654000-best-practices-for-prompt-engineering-with-openai-api>

# Beyond Gen AI Tools: The Future of Generative AI and Emerging Technologies

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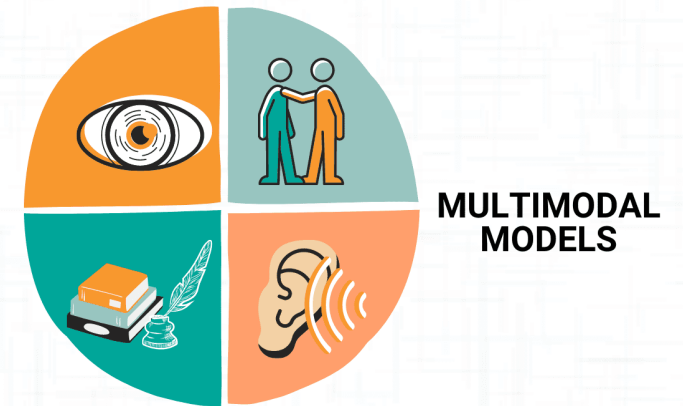
# Multimodal AI

## What is Multimodal AI?

Multimodal AI refers to artificial intelligence systems that can process and generate outputs across multiple data types or "modalities," such as text, images, audio, video, and more. Unlike traditional models that focus on one type of data, multimodal AI integrates various sources of information, providing a richer and more comprehensive understanding of the world.

## Why It Matters

Multimodal AI represents the next evolution of AI by combining multiple forms of data to create more interactive, dynamic, and contextually aware AI systems. As this technology advances, it will impact industries like healthcare, entertainment, and marketing, enabling more intuitive and human-like interactions with machines.



# **Data privacy and limitations**

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# Data security and privacy guidelines for using AI tools

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## Rules to consider when dealing with AI tools:

- **Be mindful of the data you share:** Some AI tools may use the data you submit for model training, and some store your prompts. Therefore, limit the data you share with AI tools, such as your name, personal information, work information, company name, and any other confidential data.
- **Don't trust the output of AI tools blindly:** The output of AI tools is not always correct. You may receive incorrect data, and some AI tools, like ChatGPT, are limited by the data they were trained on. Therefore, you should always double-check the output of AI tools before using it.
- **Be aware of the limitations of AI tools:** They are not perfect, and they can make mistakes, they can be biased, and much more limitations.
- **Read the terms of service and privacy policy carefully:** This will help you understand how your data will be used.
- **Only use AI tools from reputable companies:** These companies are more likely to have safeguards in place to protect your data.

# **Use cases in training and education**

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# Use cases in Education

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- Creating learning plans, learning paths and content.
- Self-assessment exercises enabling students to assess their comprehension of the studies topics.
- Generating questions, exams, interview questions, quizzes and assignments.
- Answering trainees' questions and act as virtual mentor.
- Language learning, translation, conversational practice and real-time language feedback.
- Simplified Explanation and explaining complex topics in very easy way customized for students' level and background.
- Finding and fixing errors and bugs in trainees' code
- **In Soft skills:** Practicing communication skills by acting as conversation partner, practicing interviewing skills by simulating interviews, and creating CVs.
- **In Freelancing:** Help in creating profiles, writing good proposals, and for conversations with clients.

# Use cases for learning:

- **Udacity-GPT:**
  - Is an AI chatbot powered by OpenAI (GPT-4) and designed to enhance your learning experience.
  - Learners can get the support they need whenever they need it; think of the AI chatbot as a real-time complement to our human mentors, who are available throughout the learner's journey to provide valuable human feedback and support. With AI and our global mentor network combined.
- **How Udacity-GPT helps in enhancing learning experience for students:**
  - Summarize concepts
  - Pose deeper questions
  - Translate to another language
  - Fix errors in your code
  - And more...



# **Thank you**

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# Lab



# Courses

- Exploring Generative AI: Tools, Use Cases and Future Trends :  
<https://maharatech.gov.eg/course/view.php?id=2294>
- Prompt Engineering for Beginners -Learn ChatGPT Prompting  
[Prompt Engineering for Beginners - Learn ChatGPT Prompting | Udemy](#)
- How to ChatGPT: Master the Art of Prompt Engineering  
[How to ChatGPT: Master the Art of Prompt Engineering | Udemy](#)
- Advanced Prompt Engineering for Everyone:  
<https://www.coursera.org/learn/advanced-prompt-engineering-for-everyone>
- ChatGPT Prompt Engineering for Developers:  
[https://learn.deeplearning.ai/courses/chatgpt-prompt-eng/lesson/dfbds/introduction\](https://learn.deeplearning.ai/courses/chatgpt-prompt-eng/lesson/dfbds/introduction/)
- Gen-AI: Tools for the Modern Developer:  
<https://maharatech.gov.eg/course/view.php?id=2299>

# Build a Travel Planner AI Assistant

## Objective

Design a prompt-based Generative AI assistant that helps users plan a short vacation. The assistant should provide meaningful, structured, and engaging responses using prompt engineering techniques.

## Task Overview

Your team will work together to:

1. Define a **user need** (e.g., a cultural trip, beach getaway, food-focused vacation, etc.)
2. Write and test three levels of prompting:
  - Zero-shot prompt
  - Few-shot prompt
  - Refined prompt with role + format
3. Use a GenAI tool (like ChatGPT) to test and evaluate your prompts.
4. Reflect on how prompt design impacts the quality of the output.
5. Summarize your results in a short presentation or poster.

## Deliverables

- 3 tested prompts (zero-shot, few-shot, refined)
- Output samples for each prompt
- A short reflection on what worked best and why
- A visual summary (can be slide, board paper, or digital)

## Examples of Use Cases (Pick one or invent your own):

- Weekend in a historical city
- Adventure trip for teens
- Cultural tour across multiple countries
- Eco-friendly vacation for nature lovers
- Honeymoon destination suggestions
- Tech conference planner for developers
- Student budget-friendly travel plan
- AI-generated tour for photographers
- Family-friendly beach holiday
- Remote work & travel (workation) experience



**TRAVEL PLANNER**

Destination : \_\_\_\_\_

Staying Period : \_\_\_\_\_

	Time	Activity
Day 01	08:00 AM	
	09:00 AM	
	11:00 AM	
	02:00 PM	
	04:00 PM	
Day 02	08:00 AM	
	09:00 AM	
	11:00 AM	
	02:00 PM	
	04:00 PM	
Day 03	08:00 AM	
	09:00 AM	
	11:00 AM	
	02:00 PM	
	04:00 PM	

Activate Windows  
Go to Settings to activate Windows