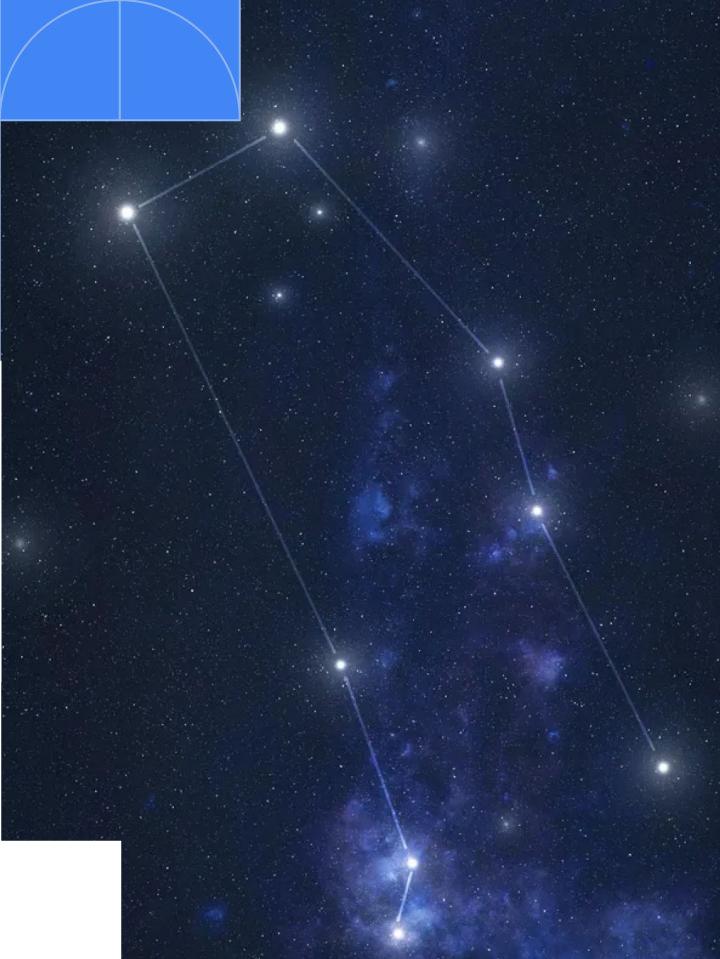
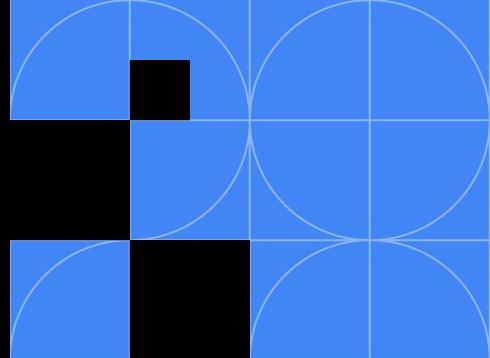


# Build with AI



## Intro to AI + Gemini 101

 Google Developer Groups  
Capital Region

# Who am I?

ChengCheng Tan

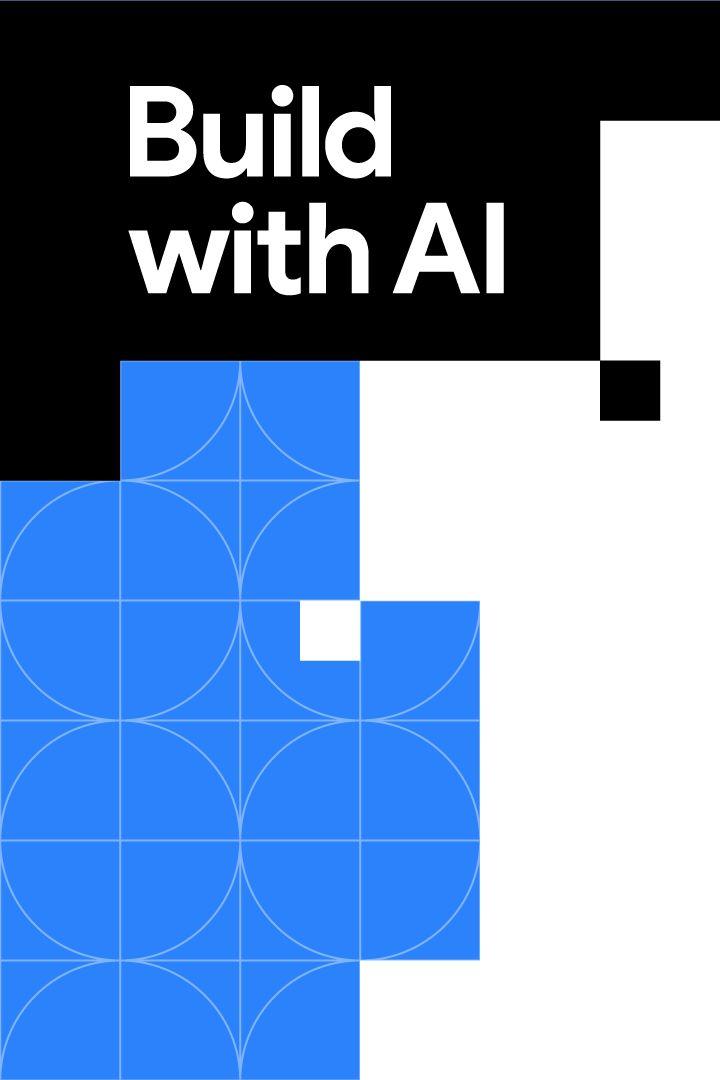
- BA Linguistics & CS, **UCLA**
- MS CS HCI, **Stanford**
- **LLM + AI Safety**  
FAR AI Communications  
AISafety.info + chatbot
- Google WTM Ambassador

\* DISCLAIMER ideas presented here are my own



temperature Reinforcement frontier  
RLHF Learning models  
Pretrained AIML Supervised video  
Gemini Generative AI Learning  
Claude LLM vision Neural Networks  
GPT tokens Multimodal  
API prompts Conversation Finetuned  
keys SDK Instruction Tuned language NLP

# Build with AI



Google Developer Groups  
Capital Region

## Intro to AI

# AI Map

## **Artificial Intelligence (AI)**

Create machines that can perform tasks with human-like abilities: reasoning, learning & problem-solving.

# AI Map

AI

GOFAI

Expert Systems

Planning Systems

Fuzzy Logic

## Machine Learning (ML)

Learn patterns from data,  
without explicit programming.

# AI Map

AI

ML

**Deep Learning**  
Complex patterns with  
neural networks.

Decision Trees

Random Forests

Gradient Boost

Naive Bayes

SVM

KNN

# AI Map

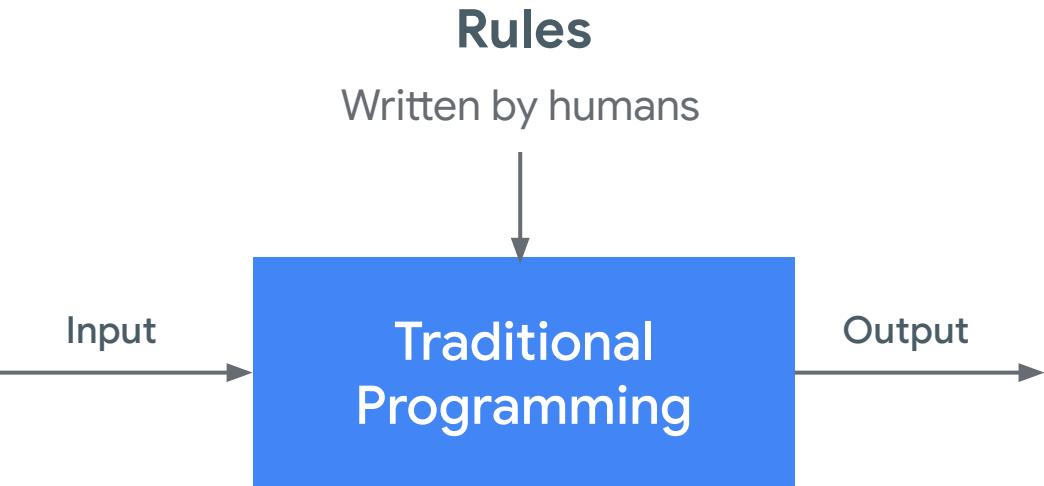
AI

ML

Deep  
Learning

Generative AI

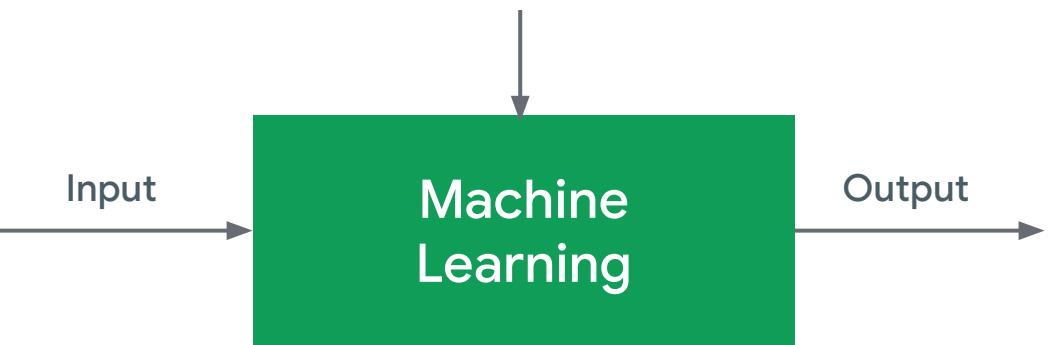
# Old GOFAI Way



# New ML Way

## Examples

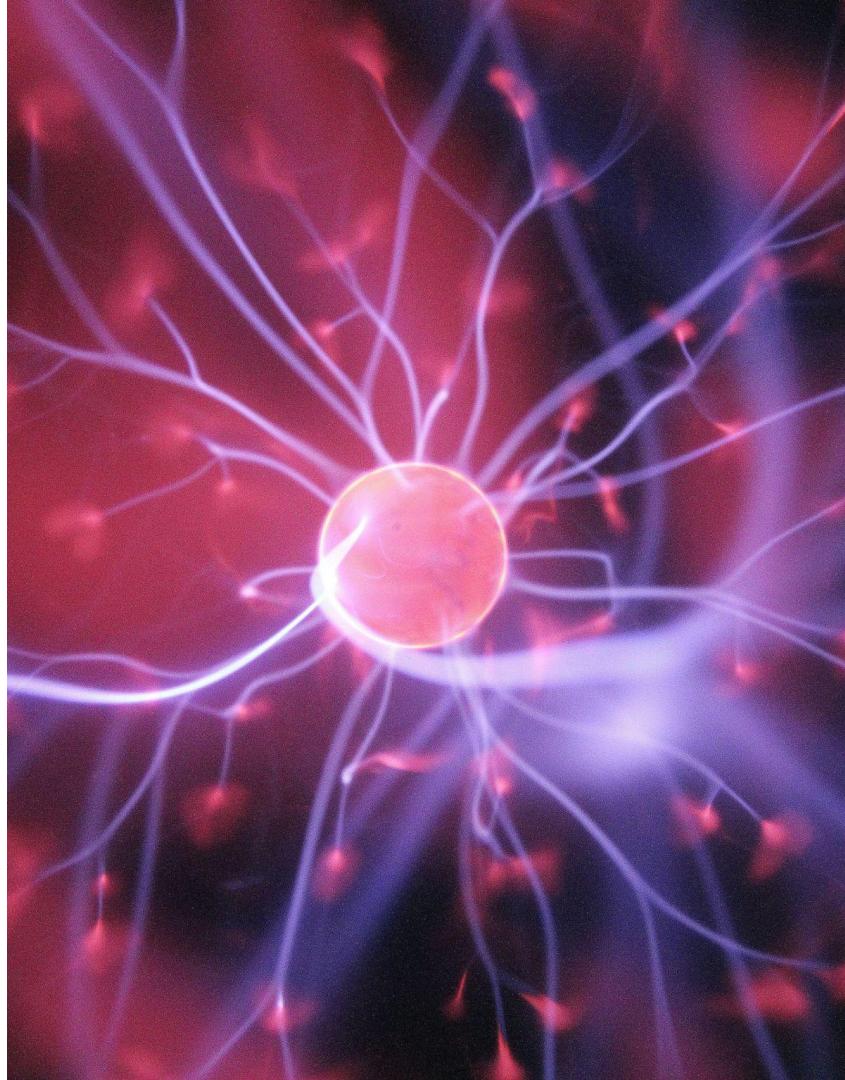
Computer learns rules



# Neural Networks

Artificial neural networks (ANN)  
are inspired by connections in the  
[human brain](#).

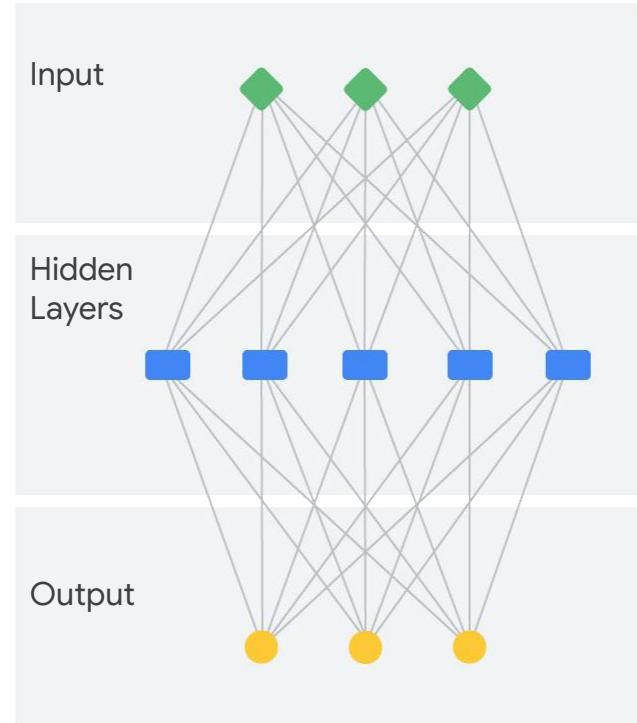
Can have one or more hidden layers.



# Neural Networks

Artificial neural networks (ANN)  
are inspired by connections in the  
[human brain](#).

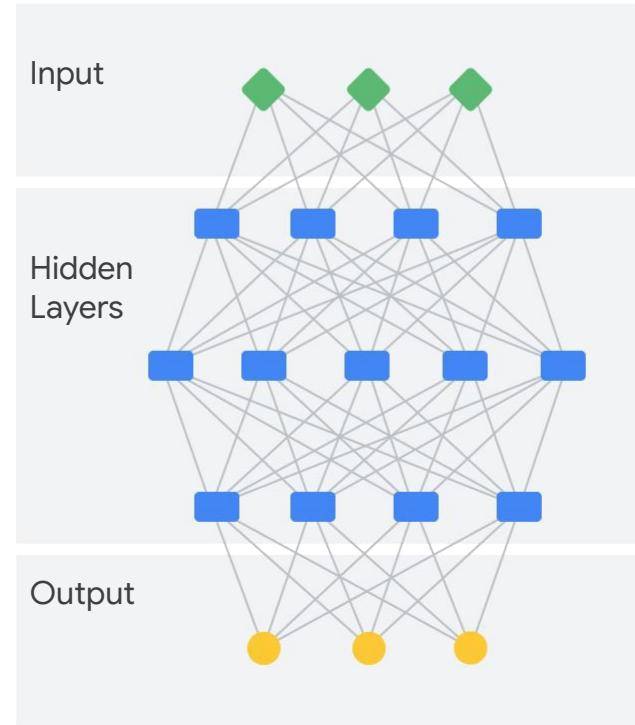
Can have one or more hidden layers.  
Each node is a neuron or parameter.



# Deep Learning

A **deep** neural network (DNN)  
with multiple hidden layers

Large foundational models have  
billions of neurons or parameters.



# AI Model Types



Discriminative  
Simple Output



Generative  
Complex Output

# Generative AI (GenAI)

AI that **generates content** for you.



Text



Code



Image



Speech



Video

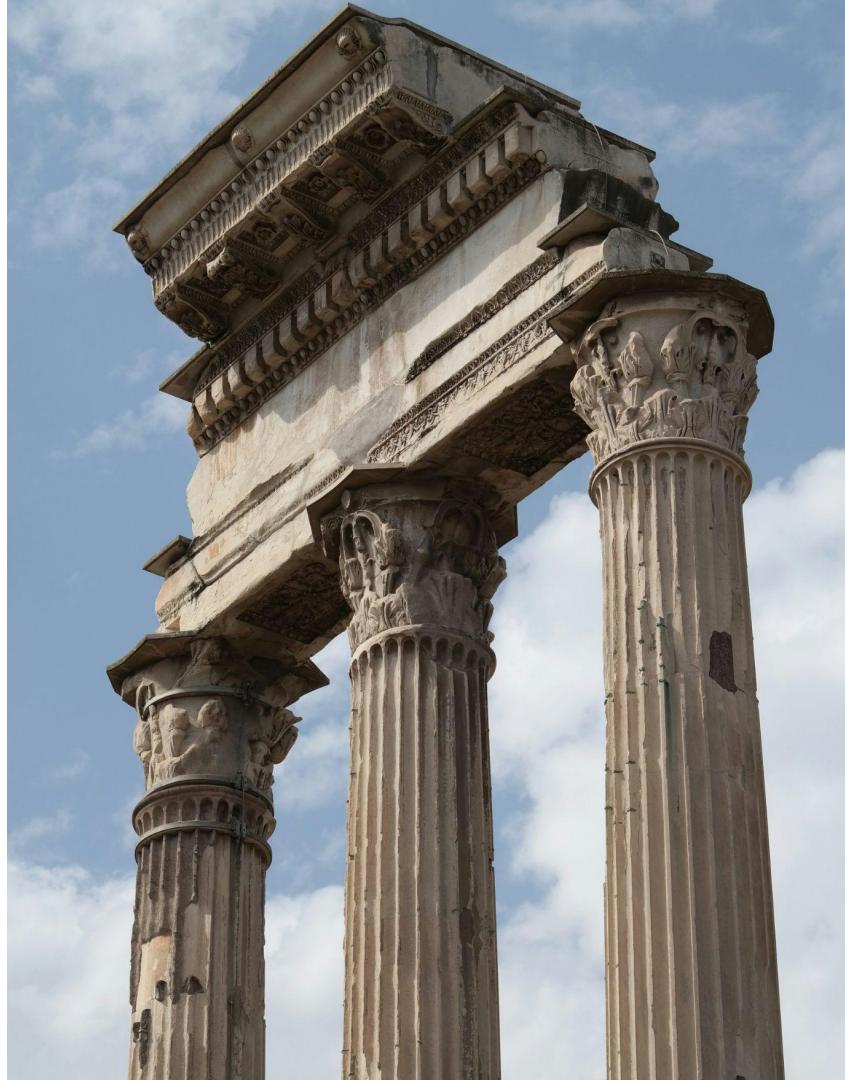


3D

# Why now?

## Converging Forces

- Data
- Algorithms
- GPU Compute



# How does it work?



Language Models

Next word prediction



Image Generation

Denoising images

# Understanding the Excitement

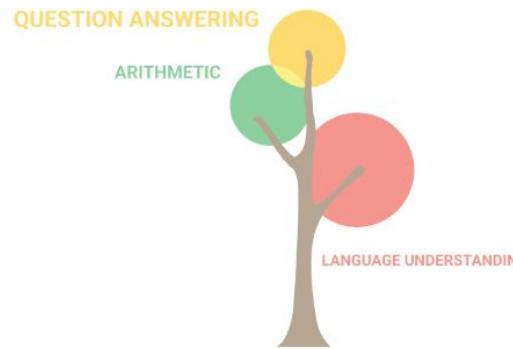


Narrow  
Specialists



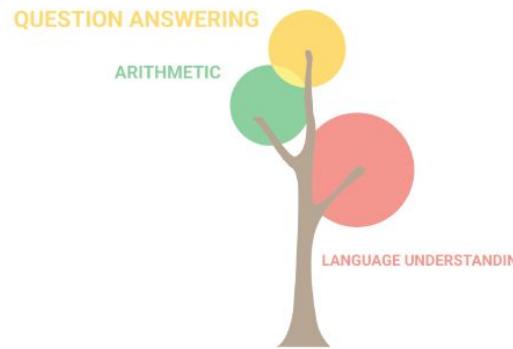
General  
Artificial General Intelligence (AGI)

# Emergent Abilities



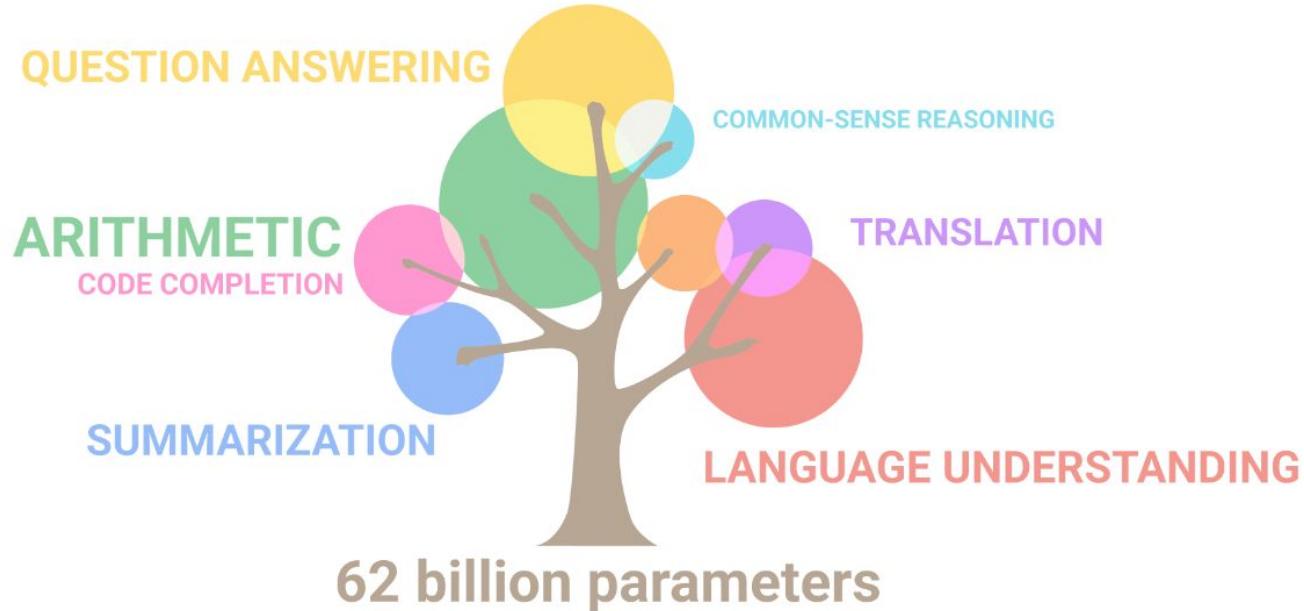
8 billion parameters

# Emergent Abilities



8 billion parameters

# Emergent Abilities



# Pre-trained Base

Generalist

vs

# Fine-tuned Models

Specialists



# RLHF:

Reinforcement Learning  
from Human Feedback

Fine-tuned

- **Follow Instructions**
- **Conversations**



# AI Map

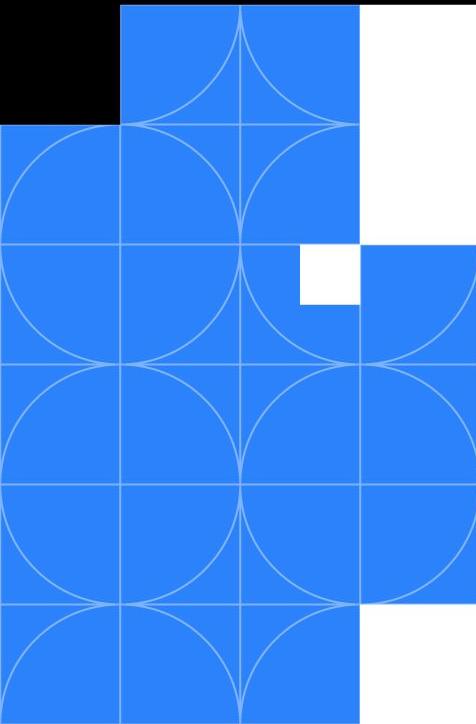
AI

ML

Deep  
Learning

Generative AI

# Build with AI

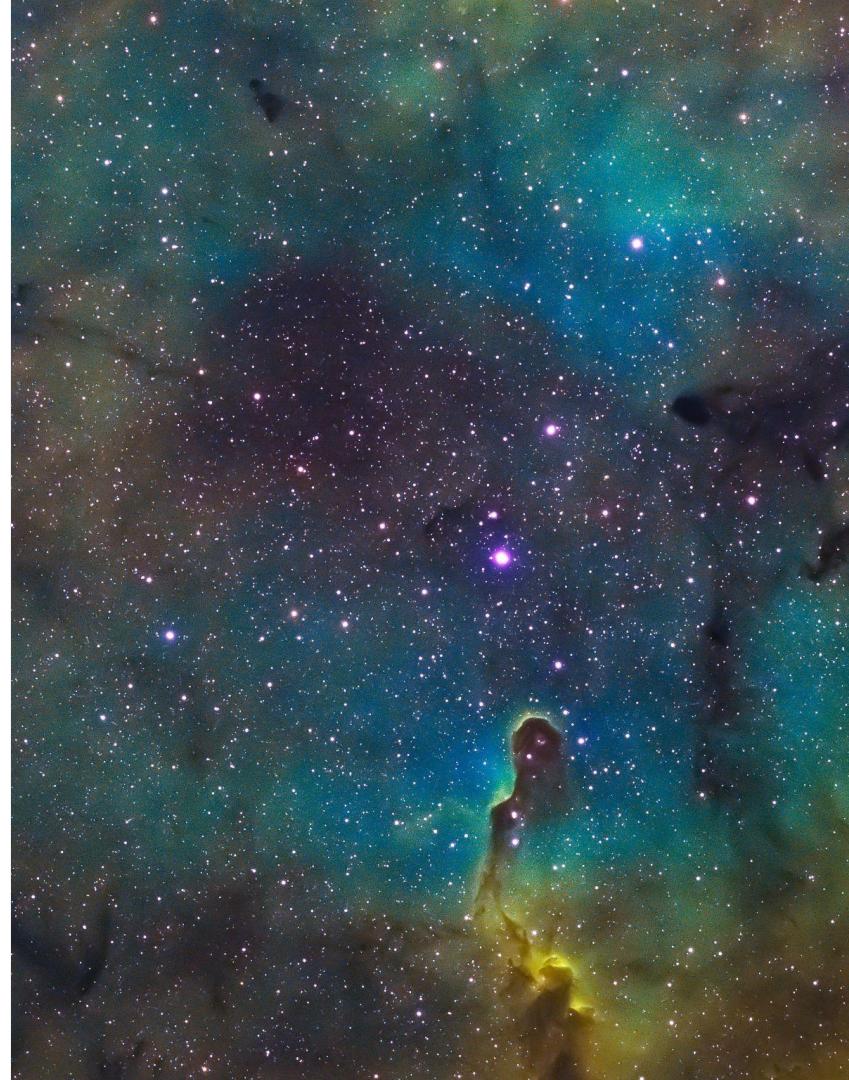


Google Developer Groups  
Capital Region

## Gemini 101

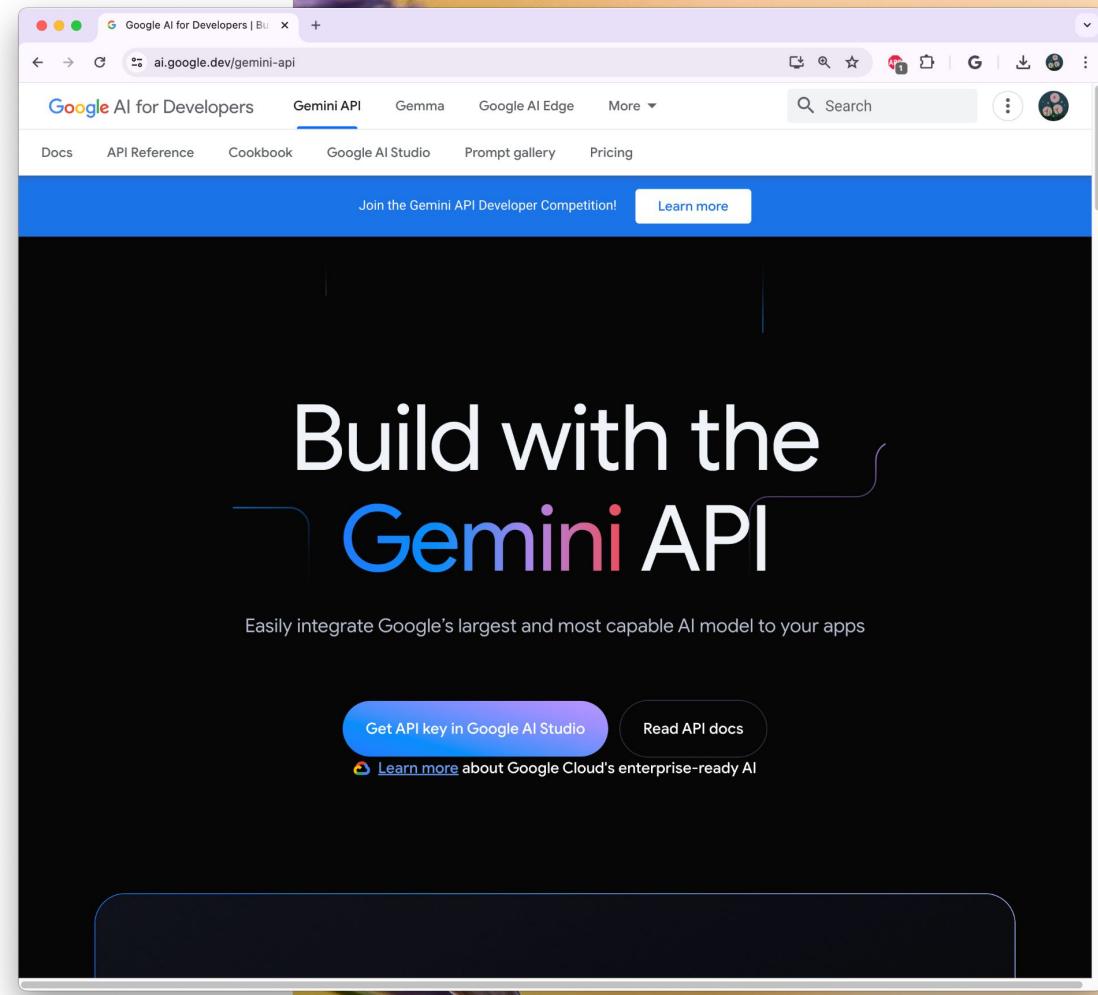


Generalized Multimodal  
Intelligence Network



# Build with Gemini API

[ai.google.dev](https://ai.google.dev)



The screenshot shows a web browser window for the Gemini API developer portal at [ai.google.dev/gemini-api](https://ai.google.dev/gemini-api). The page has a dark background with large white and blue text. At the top, there's a navigation bar with links for Google AI for Developers, Gemini API (which is underlined), Gemma, Google AI Edge, and More. Below the navigation is a search bar and a user profile icon. A blue banner at the top features the text "Join the Gemini API Developer Competition!" and a "Learn more" button. The main title "Build with the Gemini API" is prominently displayed in large white and blue letters. Below it, a subtitle reads "Easily integrate Google's largest and most capable AI model to your apps". At the bottom, there are three calls-to-action: "Get API key in Google AI Studio" (blue button), "Read API docs" (white button), and a link "Learn more about Google Cloud's enterprise-ready AI" with a small Google Cloud icon.

# Prototyping with Google AI Studio

The screenshot shows the 'My library' section of the Google AI Studio interface. On the left, a sidebar lists navigation links: 'Getting started', 'Documentation', 'Prompt gallery', 'Gemini cookbook', 'Discourse forum', and 'Build with Vertex AI on Google Cloud'. Below these are 'Settings' and the user's email, 'ccstan99@gmail.com'. The main area is titled 'My library' and contains a search bar and three filter buttons: 'Description', 'Type', and 'Updated'. A message states 'You don't have any prompts yet.' A blue button labeled '+ New chat prompt' is visible. In the center, there are three buttons: 'Chat prompt' (highlighted with a yellow box), 'Create new prompt' (with a plus sign icon), and 'Structured prompt' (with a grid icon). A tooltip for 'Chat prompt' reads: 'Chat prompts simulate a back and forth conversation with a model.'

# Prompts

- Create new
- Prompt gallery

The screenshot shows the Google AI Studio interface with a dark theme. On the left sidebar, there are several links: 'Getting started', 'Documentation', 'Prompt gallery' (which is highlighted with a yellow box), 'Gemini cookbook', 'Discourse forum', and 'Build with Vertex AI on Google Cloud'. The main area is titled 'My library' and shows a table with columns for 'Description', 'Type', and 'Updated'. A message at the top right says 'You don't have any prompts yet.' Below it is a blue button labeled '+ New chat prompt'. A yellow box highlights the 'Chat prompt' section, which contains the text: 'Chat prompts simulate a back and forth conversation with a model.'

# Run settings

- Model
- Temperature
- Safety

Marketing description writer

Given an image of a product and its target audience, write an engaging marketing description

2 / 500 examples

INPUT Product Image:	INPUT Target Audience:	OUTPUT Marketing Descri...
	Mid-aged men	Introducing the epitome of power and sophistication - the sleek and captivating sports car. It's more than just a car; it's a symbol of your passion for life and your unwavering commitment to excellence. Embrace the thrill and indulge in the ultimate driving pleasure.
	Environmentalists	Looking for a sustainable and eco-friendly way to get around? Look no further than this black bicycle. Biking is a great way to reduce your carbon footprint and improve your

Test your prompt

INPUT Product Image:	INPUT Target Audience:	OUTPUT Marketing Description:
	Athletes	Take your game to the next level with this high-quality basketball. Perfect for both indoor and outdoor courts, this ball is made with durable materials that can withstand even the most intense games. Whether you're a seasoned pro or just starting out, this basketball is perfect for anyone who loves the game.

+ Add test example

Run prompt (Ctrl/Cmd + Enter)

Run Preview 950 / 12,288

Run settings Reset

Model Gemini 1.0 Pro Visor

Temperature 0.9

Add stop sequence Add stop...

Safety settings Edit safety settings

Advanced settings

# Get Code

- Choose Language
- Open in Colab
- Copy to Editor

Given an image of a product and its target audience, write an engaging marketing description

2 / 500 examples

Actions

Get code

Create your API key before using the code in your project

You can call this prompt from the Gemini API by copying the following code into your project

cURL    JavaScript    **Python**    Android (Kotlin)    Swift    Open in Colab    [Copy](#)

```
1 """
2 At the command line, only need to run once to install the package via pip:
3
4 $ pip install google-generativeai
5 """
6
7 from pathlib import Path
8 import google.generativeai as genai
9
10 genai.configure(api_key="YOUR_API_KEY")
11
12 # Set up the model
13 generation_config = {
14     "temperature": 0.9,
15     "top_p": 0.95 }
```

Add test example

Run

Preview 950 / 12,288

Save a copy

Get code

Run settings

Reset

Model

Gemini 1.0 Pro Visor

# Get API Key

## Treat like password

The screenshot shows the Google AI Studio interface with a dark theme. On the left sidebar, there's a 'Get API key' button highlighted with a yellow box. Below it are other options: 'Create new', 'New tuned model', 'My library', 'No prompts yet', 'Getting started', 'Documentation', 'Prompt gallery', 'Discord community', and 'Build with Vertex AI on Google Cloud'. At the bottom of the sidebar are 'Settings' and the user email 'ccstan99@gmail.com'. The main content area is titled 'Get API key' and contains a sub-section titled 'API keys'. It includes a note about creating projects and using Gemini API terms of service. A modal window titled 'Create API key' is open, showing a search bar with 'Generative Language Client' and a result 'gen-lang-client-0598043526'. Below the search bar is a button 'Create API key in existing project' and a snippet of API code: 

```
-X POST "https://generativelanguage.googleapis.com/v1beta/models/gemini-pro:generateContent?key=YOUR_API_KEY"
```

. At the bottom of the modal is a link 'API quickstart guide'.

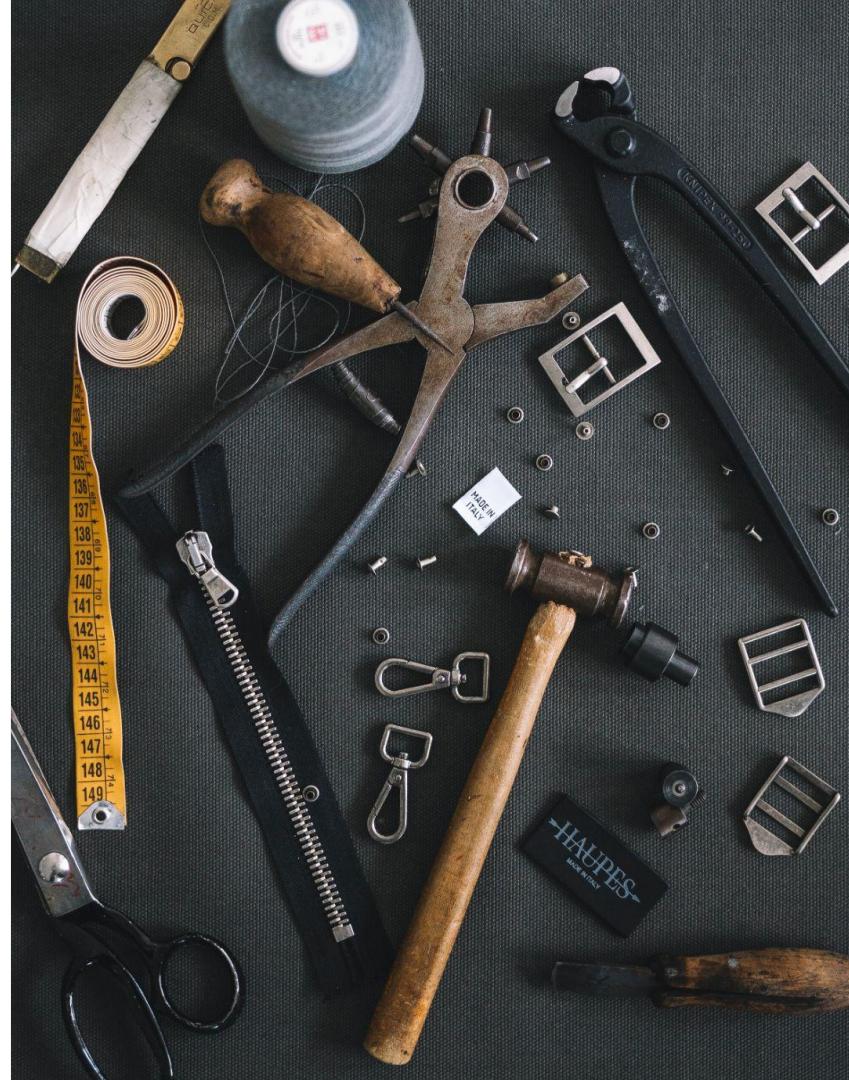
# Settings

## Tokens

- Words or subwords
- Different LLM tokenizers
- 1-2M context window

## Temperature

- Selected by probability
- Between 0 to 1.0
- Diversity or “creativity”



# Settings

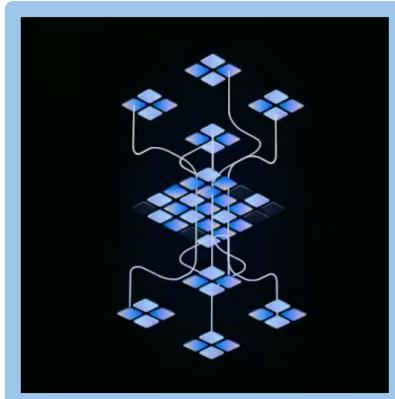
## Model Sizes



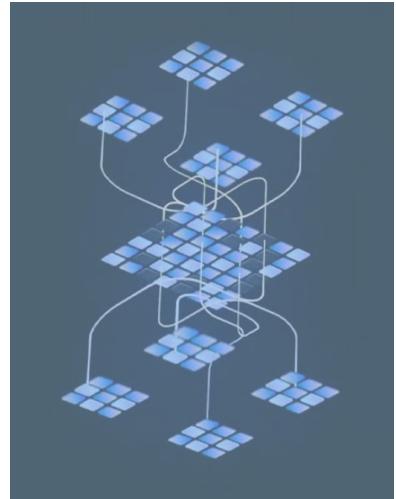
Nano



Flash



Pro



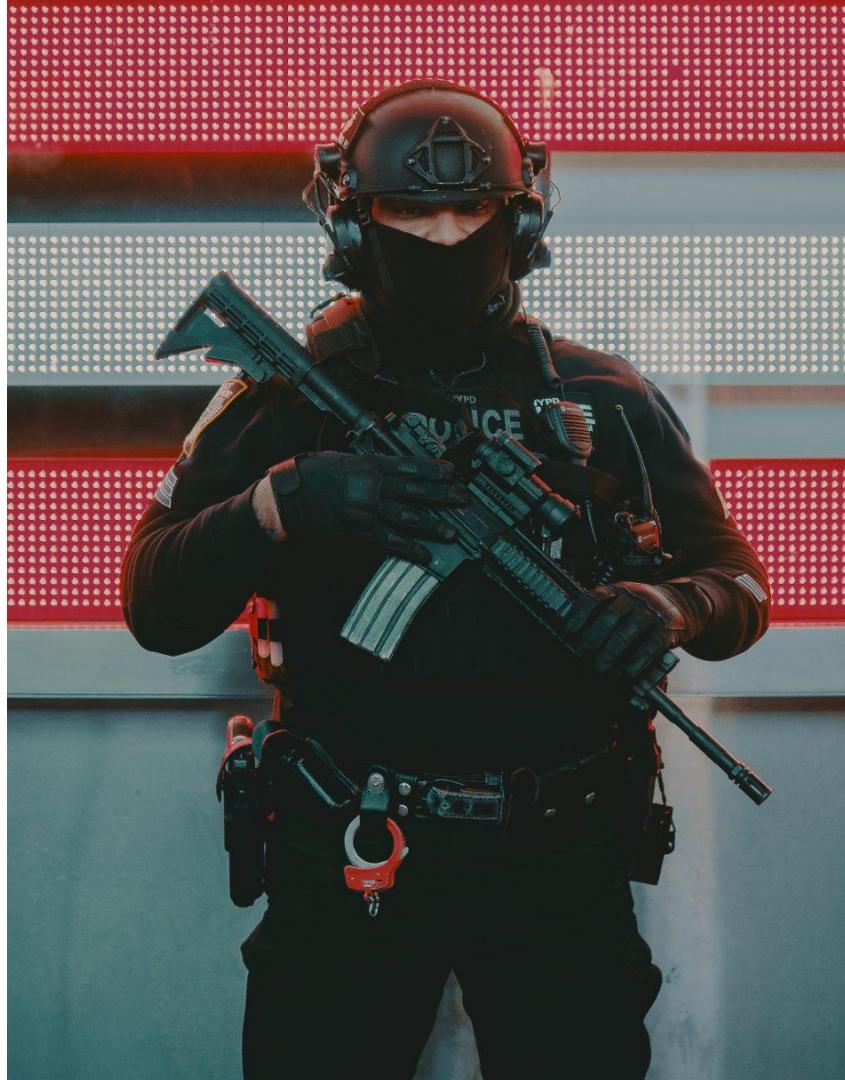
Ultra

# Settings

## Safety Ratings

### Harm Categories

- Harassment
- Hate Speech
- Sexually Explicit
- Dangerous Content



# Settings

## Safety Ratings

### Harm Categories

- Harassment
- Hate Speech
- Sexually Explicit
- Dangerous Content

### Harm Probabilities

- HIGH
- MEDIUM
- LOW
- NEGLIGIBLE

# Build with AI

“The hottest new  
programming language is  
English.”

Andrey Karpathy  
OpenAI

# Prompt Engineering

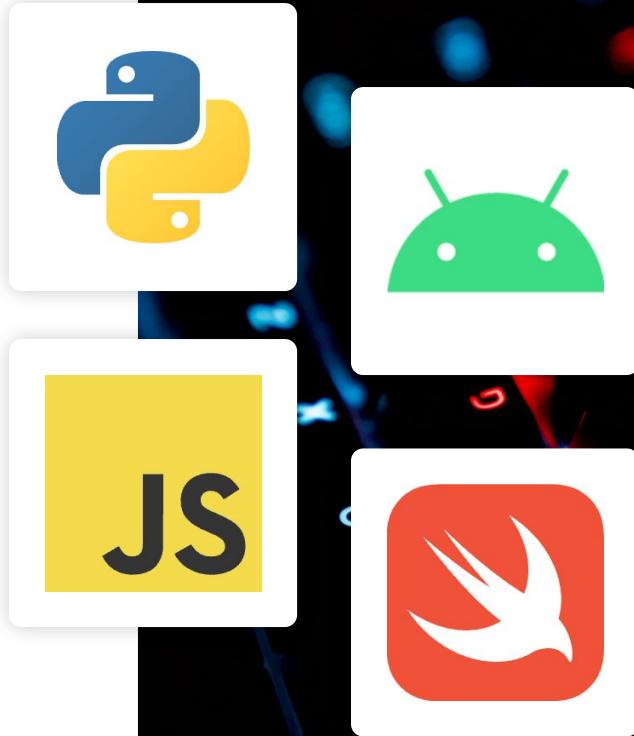
- Clear & Specific Instructions
- Give Examples
- Step by Step



# REST APIs

Client libraries for

- Python
- JavaScript
- Android (Kotlin)
- Swift
- cURL



# Setup

Install & import libraries

```
$ pip install google-generativeai
```

```
import google.generativeai as genai  
genai.configure(api_key="")
```

# Generate Text

Text only prompt

```
model = genai.GenerativeModel('gemini-1.5-flash')

response = model.generate_content("Write a story about a
boy and a backpack.")

print(response.text)
```

# Generate Text

Text and image prompt

```
model = genai.GenerativeModel('gemini-1.5-flash')
img = PIL.Image.open('image.jpg')
response = model.generate_content(["Write a blog based
on this photo.", img])
print(response.text)
```

# Chat Conversations

## For interactive applications

```
model = genai.GenerativeModel('gemini-1.5-flash')
chat = model.start_chat(history=[])

response = chat.send_message("Hello, how are you?")
print(response.text)
```

# Demo App

- Text Prompt
- Image Caption
- Chatbot

[https://  
cheng2-demo  
.streamlit.app](https://cheng2-demo.streamlit.app)

Gemini 101 · Streamlit

cheng2-demo.streamlit.app/Image\_Caption

Fork this app

Drag and drop file here  
Limit 200MB per file • PNG, JPG, JPEG

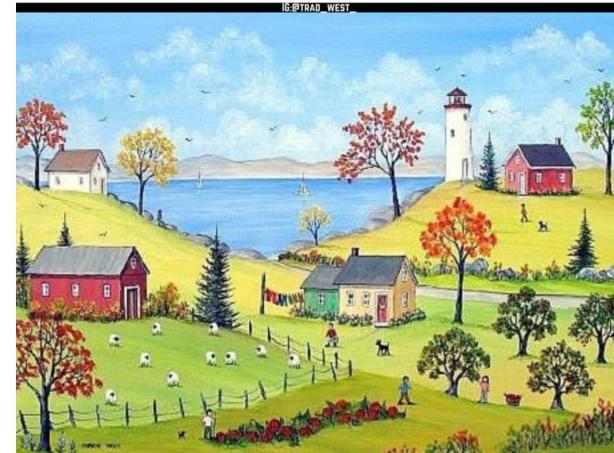
Browse files

30-30-rule.png 2.8MB

X

**TO AVOID STRAINING YOUR EYES AT WORK, USE THE 30-30 RULE.**  
**AFTER 30 MINUTES OF WORK, QUIT YOUR JOB AND BUY A 30 ACRE FARM IN THE MIDDLE OF NOWHERE.**

© PTRA WEST



Prompt

Write a haiku about this

To avoid straining eyes At work, use 30-30 rule Quit job, buy farm instead

# Demo App

- Text Prompt
- Image Caption
- Chatbot

[https://  
cheng2-demo  
.streamlit.app](https://cheng2-demo.streamlit.app)

Gemini 101 - Streamlit

cheng2-demo.streamlit.app/Chatbot

Hello

Minimal Setup

Text Prompt

Image Caption

Chatbot

Where should I go for summer vacation?

Domestic Destinations:

- Cape Cod, Massachusetts: Picturesque beaches, charming towns, and historical landmarks
- Maui, Hawaii: Tropical beaches, lush rainforests, and stunning sunsets
- Yosemite National Park, California: Stunning granite cliffs, giant sequoia trees, and cascading waterfalls
- Yellowstone National Park, Wyoming: Geysers, hot springs, wildlife sightings, and scenic hikes
- Acadia National Park, Maine: Rugged coastline, granite peaks, and picturesque lighthouses

International Destinations:

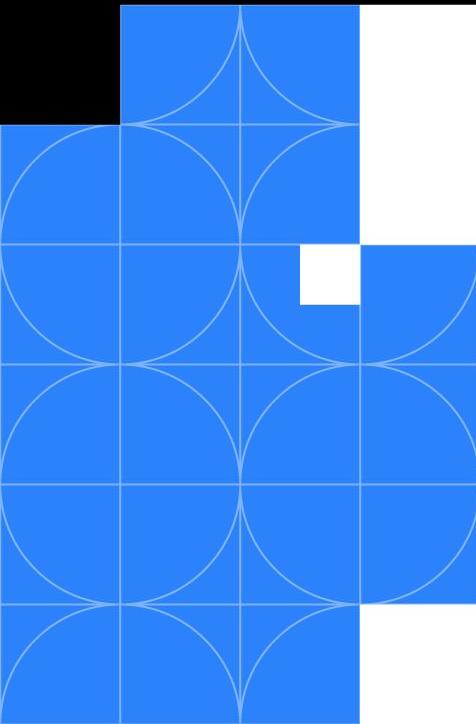
- Cancun, Mexico: White-sand beaches, turquoise waters, and vibrant nightlife
- Punta Cana, Dominican Republic: All-inclusive resorts, palm-fringed beaches, and crystal-clear waters
- Santorini, Greece: Stunning whitewashed villages, dramatic cliffs, and picturesque sunsets
- Barcelona, Spain: Vibrant city with stunning architecture, world-class cuisine, and lively beaches
- Rome, Italy: Historical ruins, iconic landmarks, delicious food, and lively piazzas

Other Factors to Consider:

- **Interests:** Determine what you enjoy doing on vacation, such as hiking, swimming, sightseeing, or relaxing.
- **Budget:** Set a realistic budget for accommodations, transportation, food, and activities.
- **Travel dates:** Peak season tends to be more expensive and crowded. Consider traveling during shoulder seasons or off-peak periods.
- **Proximity to airports:** Consider destinations that are easily accessible by plane from your home city, especially if you have limited time.

Message to Gemini...

# Build with AI



Google Developer Groups  
Capital Region

## Now Your Turn!

# Progress Tracker

1. Prototyping in Google AI Studio
2. Coding with Python Quickstart
3. Build & Deploy Streamlit App

[bit.ly/cheng2-workshop](https://bit.ly/cheng2-workshop)

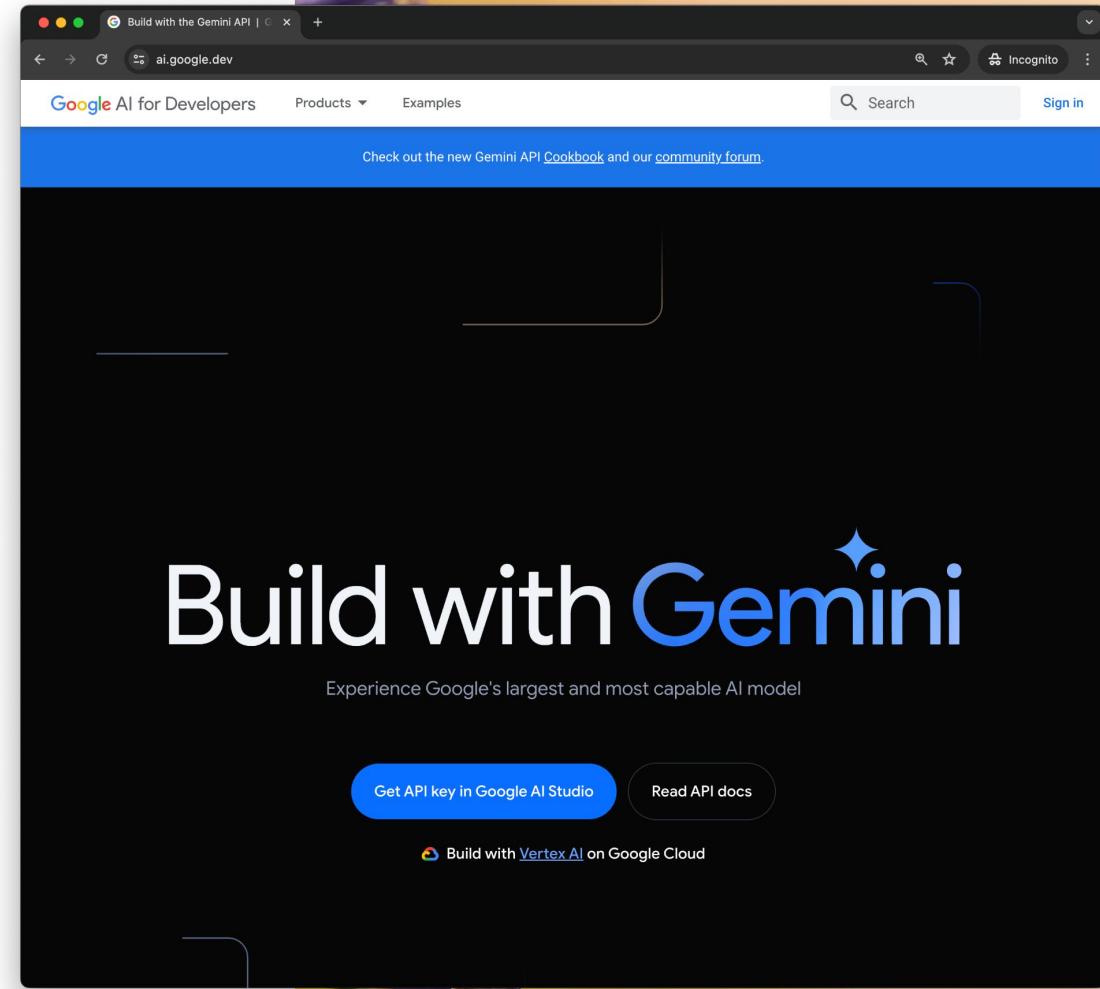
The screenshot shows a Google Sheets document titled "Cheng2 Workshop - Progress Tracker". The spreadsheet has columns A through T and rows 1 through 40. Row 1 contains column headers: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T. Row 2 contains contact information: Gmail (cheng2workshops@gmail.com), GitHub ID (ccstan), and Name (Cheng). Rows 3 and 4 are blank. Rows 5 through 11 are grouped under the heading "Prototyping" and include tasks like "Google AI Studio", "API key -- SAVE for later", "Prompt gallery", "Structured prompt", and "Get code". Rows 12 through 20 are grouped under the heading "Coding" and include tasks like "Python Quickstart", "Open colab", "Setup", "Add secrets", "List models", "Generate text (2)", and "Chat conversations". Rows 21 through 30 are grouped under the heading "Streamlit" and include tasks like "Run Demo", "Fork this app", "Sign in with GitHub", "Advance settings + secrets", "Codespace + Simple Browser", "Check deployed", "Edit & test", "Commit + Sync + Re-deploy", and "Sharing Demos! 🎉". Row 31 contains the "App URL". The "C" column is highlighted in blue. The "D" through "T" columns contain a grid of checkboxes, many of which are checked. The bottom of the sheet shows the date "2024-05-25" and a "Count: 24" indicator.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1		Cheng																	
2	Gmail	cheng2workshops@gmail.com																	
3	GitHub ID	ccstan																	
4																			
5	<b>Prototyping</b>																		
6	<a href="#">Google AI Studio</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<a href="#">API key -- SAVE for later</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<a href="#">Prompt gallery</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<a href="#">Structured prompt</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<a href="#">Get code</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11																			
12	<b>Coding</b>																		
13	<a href="#">Python Quickstart</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	<a href="#">Open colab</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	<a href="#">Setup</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	<a href="#">Add secrets</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	<a href="#">List models</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	<a href="#">Generate text (2)</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	<a href="#">Chat conversations</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20																			
21	<b>Streamlit</b>																		
22	<a href="#">Run Demo</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	<a href="#">Fork this app</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	<a href="#">Sign in with GitHub</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	<a href="#">Advance settings + secrets</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	<a href="#">Codespace + Simple Browser</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	<a href="#">Check deployed</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	<a href="#">Edit &amp; test</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	<a href="#">Commit + Sync + Re-deploy</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	<a href="#">Sharing Demos! 🎉</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	<a href="#">App URL</a>																		
32																			
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34																			
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# Google AI Studio

- Prompt gallery
- Structured prompt
- Get code
- API key

[ai.google.dev](https://ai.google.dev)



# Colab Notebook

- Setup
- Add secrets
- List models
- Generate text
- Chat conversations

[ai.google.dev/tutorials/  
python\\_quickstart](https://ai.google.dev/tutorials/python_quickstart)

The screenshot shows a Google Colab notebook titled "python.ipynb". The left sidebar contains a "Table of contents" with sections like "Copyright 2024 Google LLC.", "Get started with the Gemini API: Python", "Prerequisites", "Setup", "List models", "Generate text from text inputs", "Generate text from image and text inputs", "Chat conversations", "Count tokens", "Use embeddings", "Advanced use cases", "Safety settings", "Encode messages", "Multi-turn conversations", "Generation configuration", and "What's next". The main content area displays the "Get started with the Gemini API: Python" section, which includes a "View on Google AI" button, a "Run in Google Colab" button, and a "View source on GitHub" button. It also contains a brief description of the quickstart, a numbered list of steps, and a "Prerequisites" section.

python.ipynb

File Edit View Insert Runtime Tools Help

Table of contents

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Get started with the Gemini API: Python

Prerequisites

Setup

- Install the Python SDK
- Import packages
- Setup your API key

List models

Generate text from text inputs

Generate text from image and text inputs

Chat conversations

Count tokens

Use embeddings

Advanced use cases

- Safety settings
- Encode messages
- Multi-turn conversations
- Generation configuration

What's next

+ Section

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Show code

Get started with the Gemini API: Python

View on Google AI Run in Google Colab View source on GitHub

This quickstart demonstrates how to use the Python SDK for the Gemini API, which gives you access to Google's Gemini large language models. In this quickstart, you will learn how to:

1. Set up your development environment and API access to use Gemini.
2. Generate text responses from text inputs.
3. Generate text responses from multimodal inputs (text and images).
4. Use Gemini for multi-turn conversations (chat).
5. Use embeddings for large language models.

Prerequisites

You can run this quickstart in [Google Colab](#), which runs this notebook directly in the browser and does not require additional environment configuration.

Alternatively, to complete this quickstart locally, ensure that your development environment meets the following requirements:

- Python 3.9+
- An installation of `jupyter` to run the notebook.

Setup

# Colab Notebook

- Setup
- Add secrets
- List models
- Generate text
- Chat conversations

[ai.google.dev/tutorials/  
python\\_quickstart](https://ai.google.dev/tutorials/python_quickstart)

The screenshot shows a Google Colab notebook titled "python.ipynb". The left sidebar displays a "Secrets" panel where a secret named "GOOGLE\_API\_KEY" has been added with a value represented by a series of dots. Below this, code snippets demonstrate how to access the secret in Python:

```
from google.colab import userdata
userdata.get('secretName')
```

and

```
# Or use `os.getenv('GOOGLE_API_KEY')` to fetch an environment variable.
GOOGLE_API_KEY=userdata.get('GOOGLE_API_KEY')

genai.configure(api_key=GOOGLE_API_KEY)
```

The main content area contains two sections: "Setup your API key" and "List models". The "Setup your API key" section provides instructions for obtaining an API key from Google AI Studio and adding it to the secrets manager. It also shows how to pass the key to the Gemini API using environment variables or direct assignment. The "List models" section shows a code snippet for listing available Gemini models:

```
[ ] for m in genai.list_models():
    if 'generateContent' in m.supported_generation_methods:
        print(m.name)
```

Note: For detailed information about the available models, including their capabilities and rate limits, see [Gemini models](#). There are options for requesting [rate limit increases](#). The rate limit for Gemini-Pro models is 60 requests per minute (RPM).

The genai package also supports the PaLM family of models, but only the Gemini models support the generic, multimodal capabilities of the generateContent method.

# Streamlit App

- Fork the app
- Sign in with GitHub
- Setup secrets
- Edit & test
- Deploy & share!

[https://  
cheng2-demo  
.streamlit.app](https://cheng2-demo.streamlit.app)

The screenshot shows a Streamlit application window titled "Gemini 101 - Streamlit". The sidebar on the left lists several demo options: "Hello", "Minimal Setup", "Text Prompt", "Image Caption", and "Chatbot". Below the sidebar is a green button with the text "Select a demo above.". The main content area features a large heading "Welcome to the Gemini Demo! 🌟" and a sub-section titled "Resources to continue learning:" which lists links to Gemini + AI Studio, Gemini Quickstart Tutorials, Streamlit Tutorials, Introduction to Generative AI, and DeepLearning.AI. At the bottom of the main content area is a section titled "Feedback & stay in touch:" with a link to a feedback survey.

Gemini 101 - Streamlit

cheng2-demo.streamlit.app

Hello

Minimal Setup

Text Prompt

Image Caption

Chatbot

Select a demo above.

## Welcome to the Gemini Demo! 🌟

This is the companion code for the Intro to AI + Gemini 101 workshops to quickly build and deploy Gemini-powered apps. ➔ Select a demo from the sidebar for ideas and adapt for your own projects!

### Resources to continue learning:

- [Gemini + AI Studio](#) -- Prototyping environment with Gemini
- [Gemini Quickstart Tutorials](#) -- Examples to build in different programming languages
- [Streamlit Tutorials](#) -- Build web apps calling LLMs
- [Introduction to Generative AI](#) -- Google learning paths with videos & exercises
- [DeepLearning.AI](#) -- Full specializations + many short 1-hour courses

### Feedback & stay in touch:

- [Feedback survey](#)

# Resources

[bit.ly/cheng2-slides](https://bit.ly/cheng2-slides)

## 1. Gemini + AI Studio

Prototyping environment with Gemini

## 2. Gemini Quickstart Tutorials

Examples to build in different programming languages

## 3. Streamlit Tutorials

Build web apps calling LLMs

## 4. Introduction to Generative AI

Google learning paths with videos & exercises

## 5. DeepLearning.AI

Full specializations + many short 1-hour courses



# Competition

- Gemini API Developer Competition
- Share +\$1 million in cash or other cool prizes
- Ends August 12
- Tag us if you submit

[ai.google.dev/  
competition](https://ai.google.dev/competition)

The screenshot shows a dark-themed web page for the Gemini API Developer Competition. At the top, there's a navigation bar with links for Google AI for Developers, Gemini API, Gemma, Google AI Edge, Tools, More, a search bar, and a sign-in button. The main title "Gemini API Developer Competition" is displayed in large, white, sans-serif font. Above the title is a blue starburst icon. Below the title, a callout states "SUBMISSION ENDS AUG 12, 2024". A timer at the bottom indicates "79 Days", "12 Hours", and "09 Minutes" until the submission deadline. A blue button labeled "Sign in to join competition" is also present.

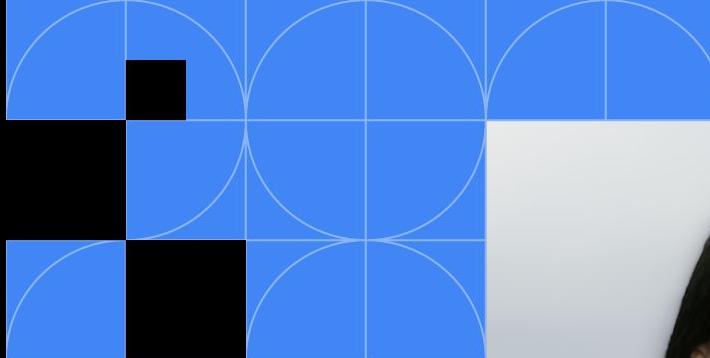
# Special Gift!

- Google Cloud Platform to use **Vertex AI**
- Free tier + credits
- **Google Cloud Innovators**  
Join for training with free Cloud Skills Boost

[trygcp.dev/e/  
build-ai-DC02](https://trygcp.dev/e/build-ai-DC02)

The screenshot shows a Google Chrome browser window with the URL [trygcp.dev/e/build-ai-DC02](https://trygcp.dev/e/build-ai-DC02). The page is titled "GDG Capital Region Build w/AI". It displays a message stating: "Your credit will allow you to use Google Cloud [Free Tier products](#). It has an amount of **\$5**. Once redeemed, it will be valid for **180 days** or until the balance is depleted if you use non-free services." Below this is a button labeled "CLICK HERE TO ACCESS YOUR CREDITS". At the bottom right, there is a small icon and the text "GCP Credits #5549820".

# Build with AI



## ChengCheng Tan

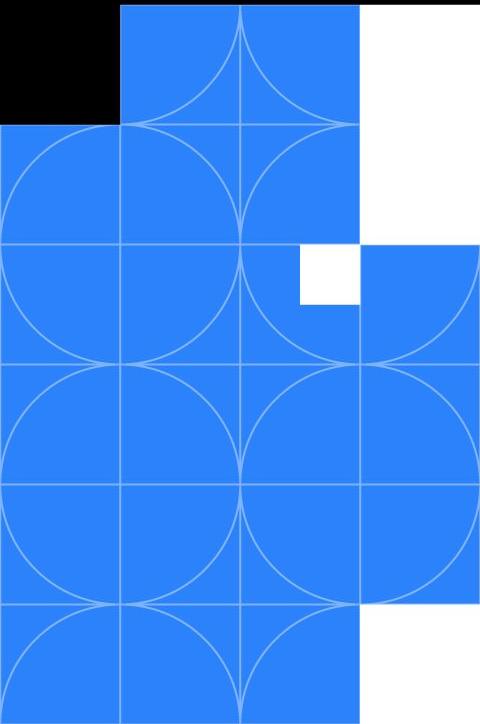
ccstan99@gmail.com

cheng2-tan

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Google Developer Groups  
Capital Region

# Build with AI



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