

fun-ai-talk

# Let's train an Emoji-GPT in 1 hour!

[github.com/hululuzhu/emojiGPT](https://github.com/hululuzhu/emojiGPT)

*Last update: Aug 2023  
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# Disclaimer

- This talk is my personal voluntary effort, prepared and conducted during my personal time outside of working hours.
- All content is derived from publicly available sources, and the views expressed herein only represent my personal opinions, and do not reflect the positions of Google.
- All pictures (except colab/github screenshot and Google product logos) used in this deck without reference are generated by me using Midjourney

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May 2023

Me: 10+ yoe, various roles @ Google/Alphabet®

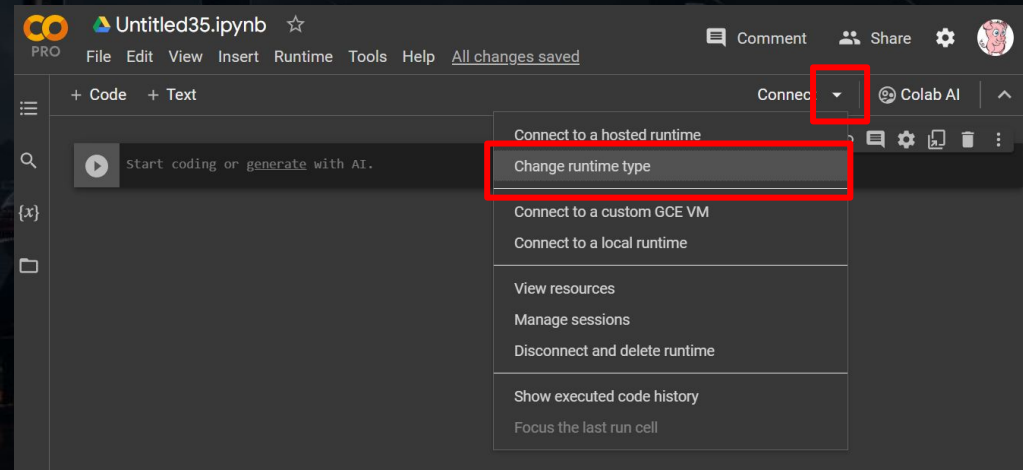
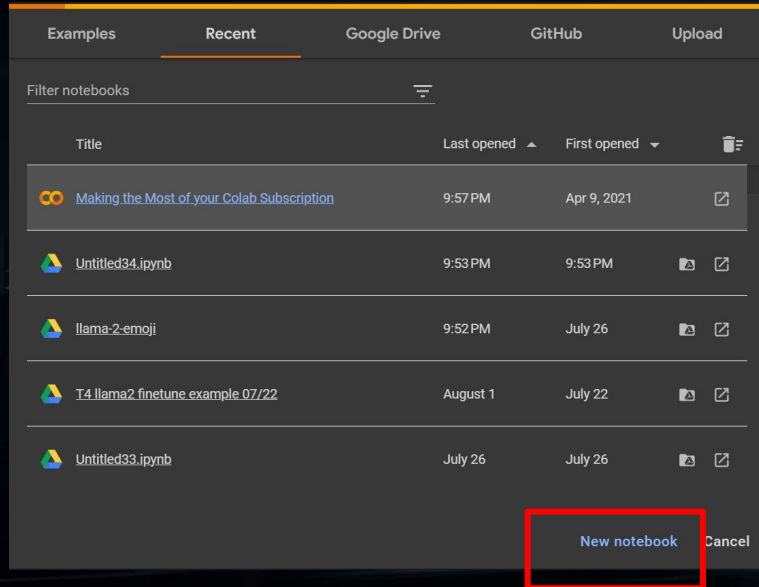


A dark, atmospheric night photograph of the Shanghai skyline. The Oriental Pearl Tower is the central focus, its two spheres and spire clearly visible against the dark sky. Other skyscrapers, including the Shanghai Tower, are visible in the background, their lights reflecting on the water in the foreground. The overall tone is dark and moody.

Colab + Demo

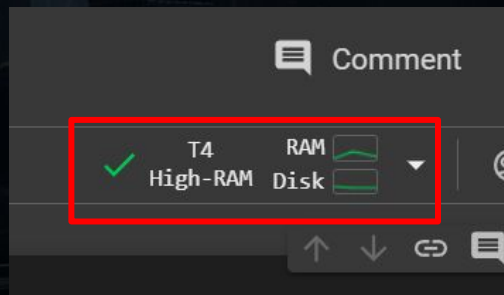
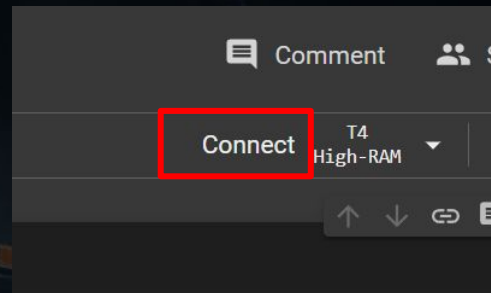
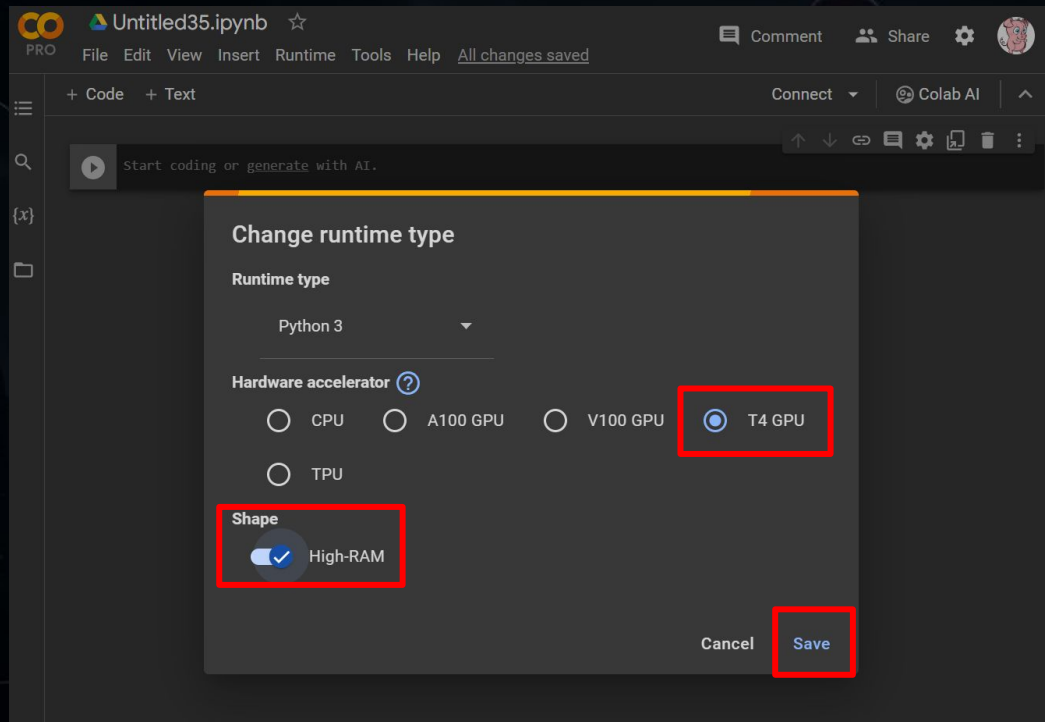
# Open a “new notebook” and “change runtime type”

- Assume colab pro, if you use other environment, let's chat at 8pm
- <https://colab.research.google.com/>



## T4 + High-RAM required

- (V100 does not work, A100 hard to schedule)



# Run demo code! ~5 mins

- <https://huggingface.co/hululu-zhu/llama2-chat-emoji-lora#code-to-reproduce>
  - Copy the code
  - Past to Colab code box
  - Please remove “#” to uncomment first 4 lines to install necessary packages
  - Click ▶ to run
- Answer more questions!  
*answer("why should I want to learn AI tonight?")*

```
!pip install -q bitsandbytes
!pip install -q peft
!pip install -q transformers
!pip install sentencepiece

from peft import PeftModel
import transformers
import torch
from transformers import LlamaTokenizer, LlamaForCausalLM

model_name_or_path = "daryl149/llama-2-7b-chat-hf"
tokenizer_name_or_path = "daryl149/llama-2-7b-chat-hf"

tokenizer = LlamaTokenizer.from_pretrained(tokenizer_name_or_path)
tokenizer.pad_token_id = 0
tokenizer.padding_side = "left"

original_8bit_llama_model = LlamaForCausalLM.from_pretrained(
    model_name_or_path,
    device_map="auto",
    load_in_8bit=True)
```

```
answer("why should I want to learn AI tonight?")
```

A dark, atmospheric night photograph of the Shanghai skyline. The Oriental Pearl Tower is the central focus, with its distinctive spheres and spire. Other skyscrapers like the Shanghai Tower and Jin Mao Tower are visible in the background. The city lights are reflected on the water in the foreground, which shows some motion blur. The overall tone is dark and moody.

# Review the “problem”: EmojiGPT



# We like an AI to only use Emoji to answer questions!



“Why do we need to wear seat belts in the car?”

“Because blabla blabla blabla blabla blabla”

No, too boring!



# We like an AI to only use Emoji to answer questions!



Why do we need to wear seat belts in the car?



Yay!



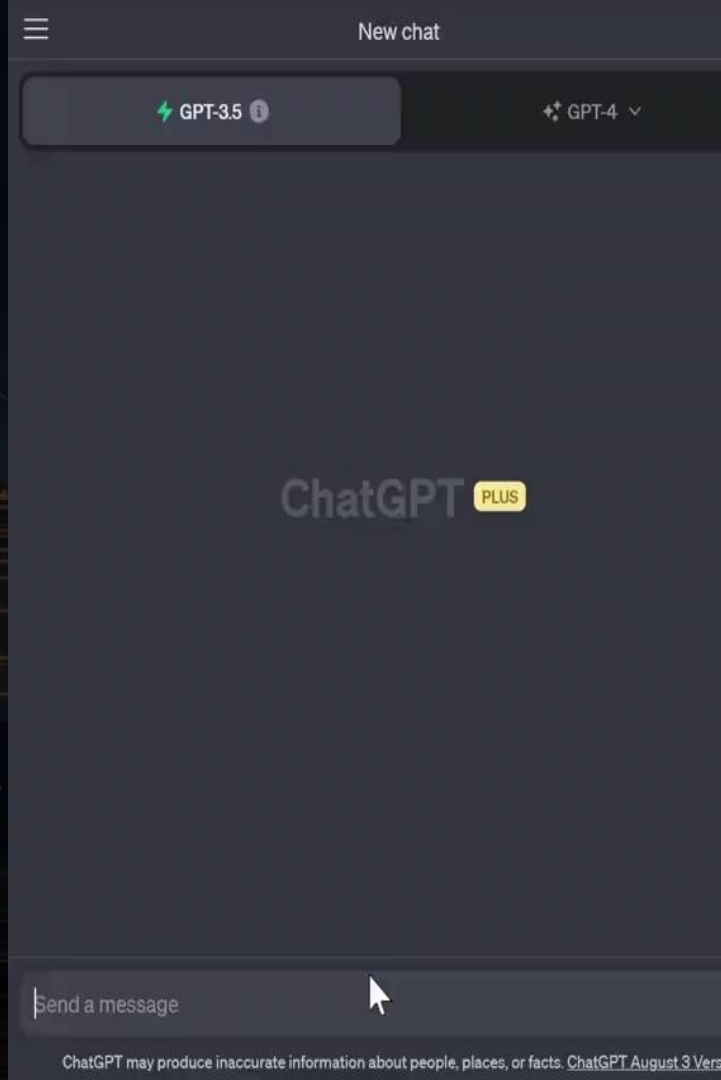
# Is it a solved problem?

Well, looks like almost there with ChatGPT!

- It did give Emoji after my instruction
- It remembered the style for the follow up question
- But it contains additional text

So, can we train our own AI to get the “best of ChatGPT” to make our own EmojiGPT AI?

- *In theory, we can further tune the input to ChatGPT (prompt) to do better!*



A dark, atmospheric night photograph of the Shanghai skyline. The Oriental Pearl Tower is the central focus, its three spheres and spire illuminated against the dark sky. Other skyscrapers like the Shanghai Tower and Jin Mao Tower are visible in the background, their lights reflecting on the water in the foreground. The overall tone is moody and futuristic.

# Plan: Llama2 as a Foundation AI

# We need a Large Language Model!

A language model that has “read” huge amount of books (more than millions), and “followed” human instructions. So that it could understand human language text including emojis, and give out good response given questions!





# Llama-2-chat

- Meta AI (aka Facebook) release [Llama2](#) for free!
  - ❤️❤️❤️ Meta ❤️❤️❤️
- We chose a 7B chat version
  - 7B is already a huge size model that is capable enough
  - Chat version has further human instruction alignment than base
- Why not train our own LLM from scratch?
  - Because training a high quality LLM at llama-2 scale will take months and cost more than \$20 million! (reference)



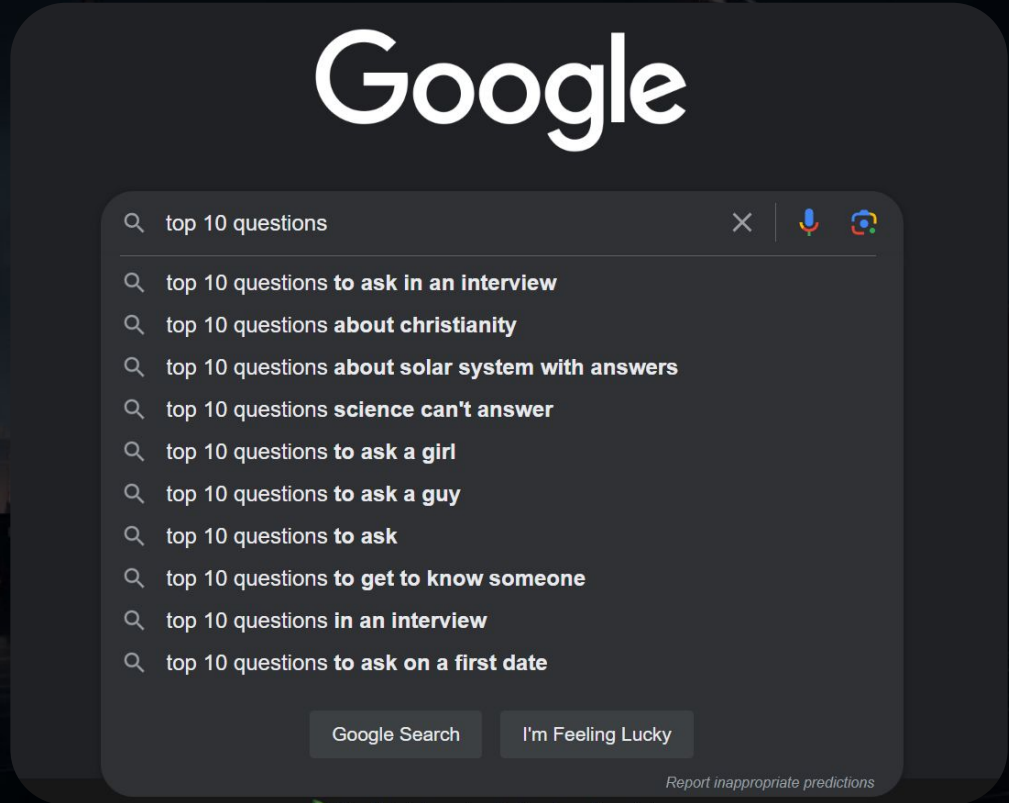
A dark, atmospheric night photograph of the Shanghai skyline. The Oriental Pearl Tower is the central focus, with its distinctive spheres and spire. Other skyscrapers like the Shanghai Tower and Jin Mao Tower are visible in the background, their lights reflecting on the water in the foreground. The overall tone is dark and moody.

“Data Collection” Question+Emoji pairs !

# First step, what questions to start?

How to find the “seed” questions?

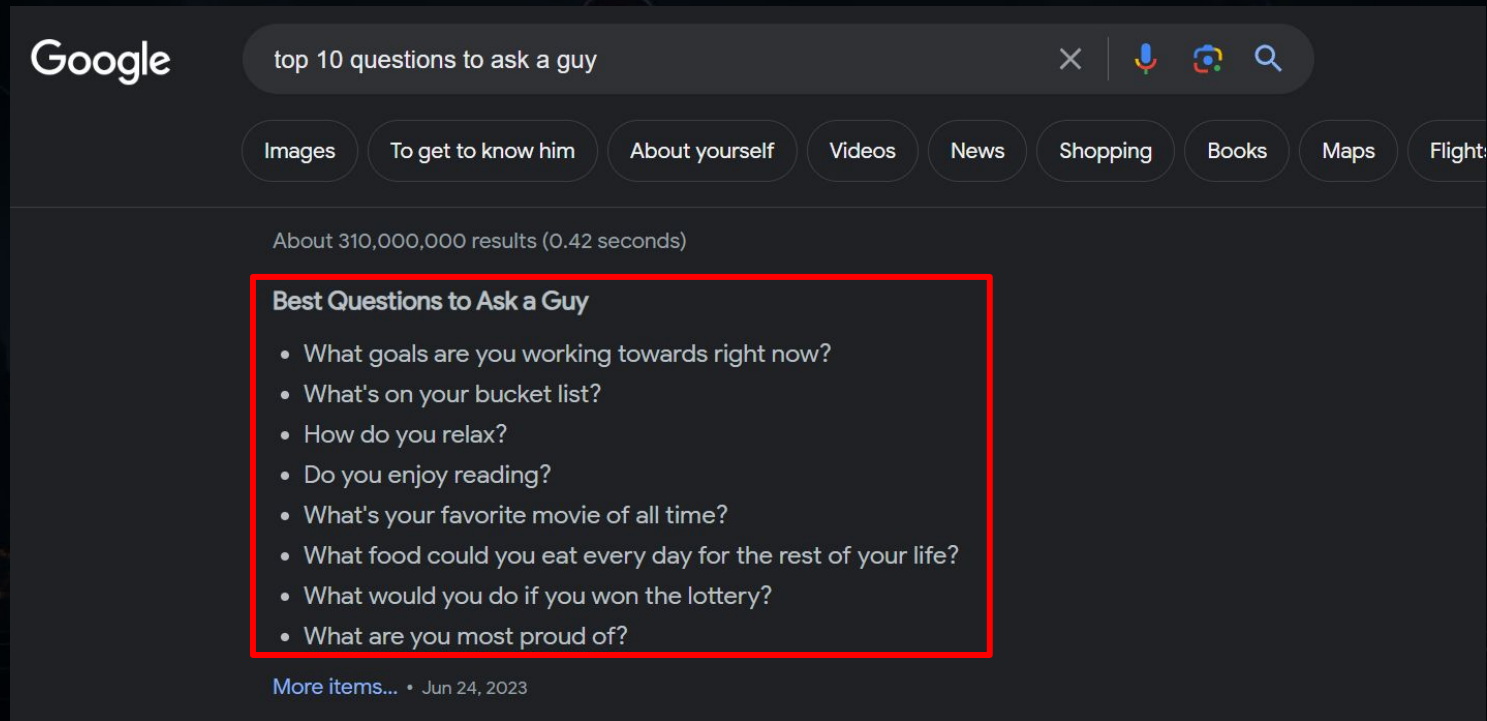
- Maybe start with Google search!





# Second, now you get top K questions to start with!

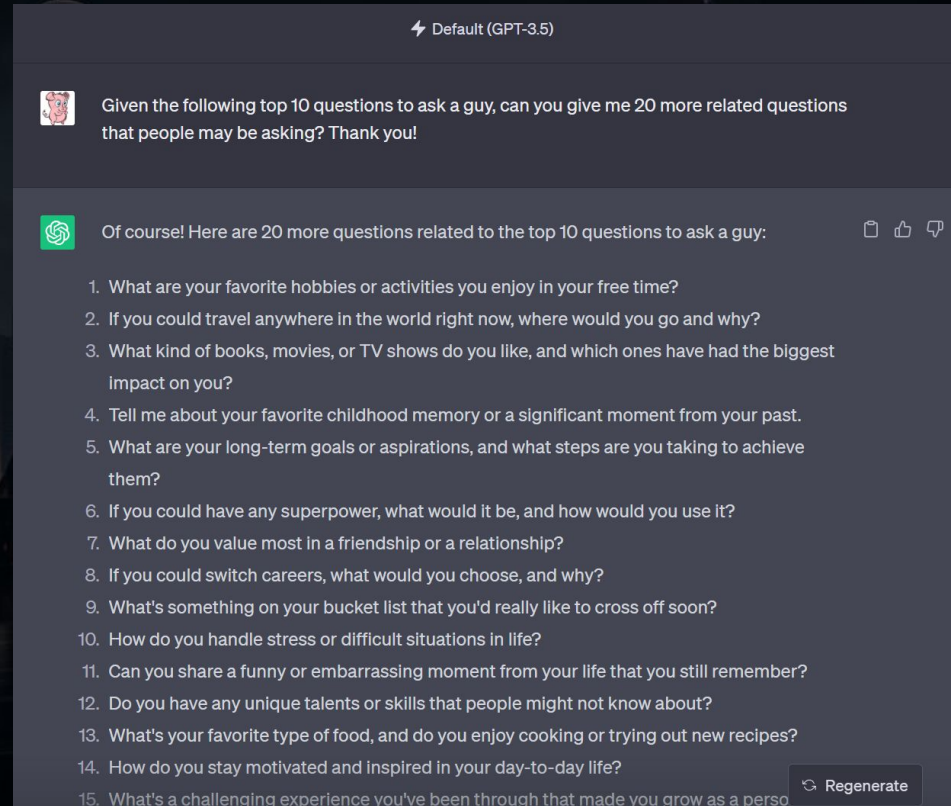
e.g.



# Third, how to get more than 100 questions?

What if we need more questions (e.g. 200+) to train a good model?

- We can use ChatGPT!  
*Given the following top 10 questions to ask a guy, can you give me 20 more related questions that people may be asking? Thank you!*
- *And repeat until you get enough questions!*



# Fourth, get Emoji answers?!!

But how? This is hard!

- Ask ChatGPT to do that!  
*You are an expert of Emoji.  
Can you respond to my  
questions only using 3-5  
emoji? Thank you!  
[your\_questions]*
- Repeat until you collect all  
answers!

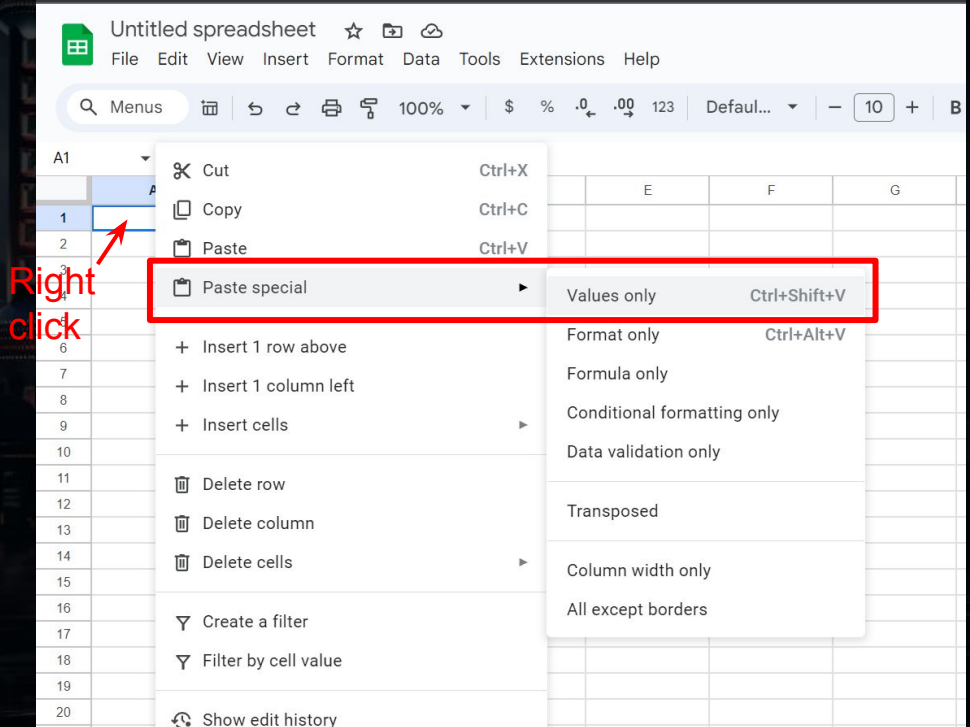


You are an expert of Emoji. Can you respond to my questions only using 3-5 emoji? Thank you! What goals are you working towards right now?  
What's on your bucket list?  
How do you relax?  
Do you enjoy reading?  
What's your favorite movie of all time?  
What food could you eat every day for the rest of your life?  
What would you do if you won the lottery?  
What are you most proud of?




# How to merge the data?

1. Start a new spreadsheet at <https://docs.google.com/spreadsheets>
2. Copy questions or answers from ChatGPT, right click, paste special, “value only”
  - a. Otherwise you will see data merged to one cell!
3. You may save as CSV (file, export) or other formats



Now after some effort, you will get a nice set of data to “teach” Llama2! (like [my example](#))

Question (string)	Answer (string)
"How do elephants spray water from their trunks?"	"🐘💧🌊"
"Why do we need to recycle paper and plastic?"	"♻️📄🌍"
"How do bees dance to communicate with each other?"	"🐝💃👥"
"Why do we need to turn off lights when leaving a room?"	"💡🚪🔌"
"How do stars shine in the night sky?"	"✨🌌🔥"
"Why do we have different types of soil?"	"🌍🌱🔬"
"How do worms help the soil in a garden?"	"💜🌱📌"
"Why do we need to wash fruits and vegetables before eating them?"	"🍎🚰🍴"
"How do birds know where to migrate each year?"	"🐦🌍🕒"
"Why do we have different types of animals in different habitats?"	"🦁🌳🌊🐼"

A dark, atmospheric photograph of the Shanghai skyline at night. The Oriental Pearl Tower is the central focus, its illuminated spheres standing out against the dark sky. Other skyscrapers are visible in the background, their lights reflecting on the water in the foreground. The overall tone is dark and moody.

It is time!

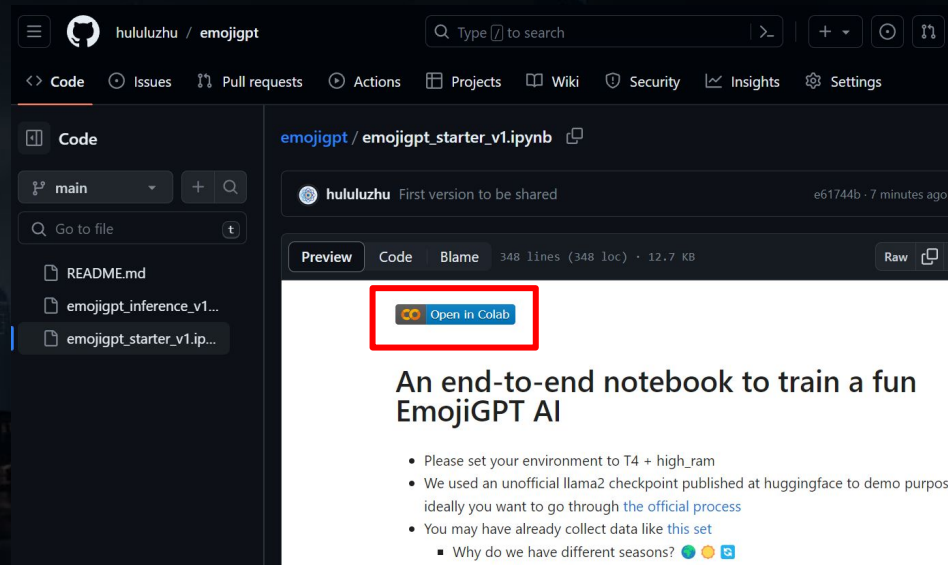
Let's start training EmojiGPT!  
Optionally, we can publish it after!



Let's switch to this colab notebook!

[https://github.com/hululuzhu/emojigpt/blob/main/emojigpt\\_starter\\_v1.ipynb](https://github.com/hululuzhu/emojigpt/blob/main/emojigpt_starter_v1.ipynb)

Click this colab icon



hululuzhu / emojigpt

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Code

main + 🔍


Go to file 🔍

- README.md
- emojigpt\_inference\_v1...
- emojigpt\_starter\_v1.ip...

emojigpt / emojigpt\_starter\_v1.ipynb

hululuzhu First version to be shared e61744b · 7 minutes ago

Preview Code Blame 348 lines (348 loc) · 12.7 KB Raw

 Open in Colab

### An end-to-end notebook to train a fun EmojigPT AI

- Please set your environment to T4 + high\_ram
- We used an unofficial llama2 checkpoint published at huggingface to demo purposes ideally you want to go through [the official process](#)
- You may have already collect data like [this set](#)
  - Why do we have different seasons? 🌈 🌞 🌧️



We made it !





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