

Mastering ChatGPT Prompts and API

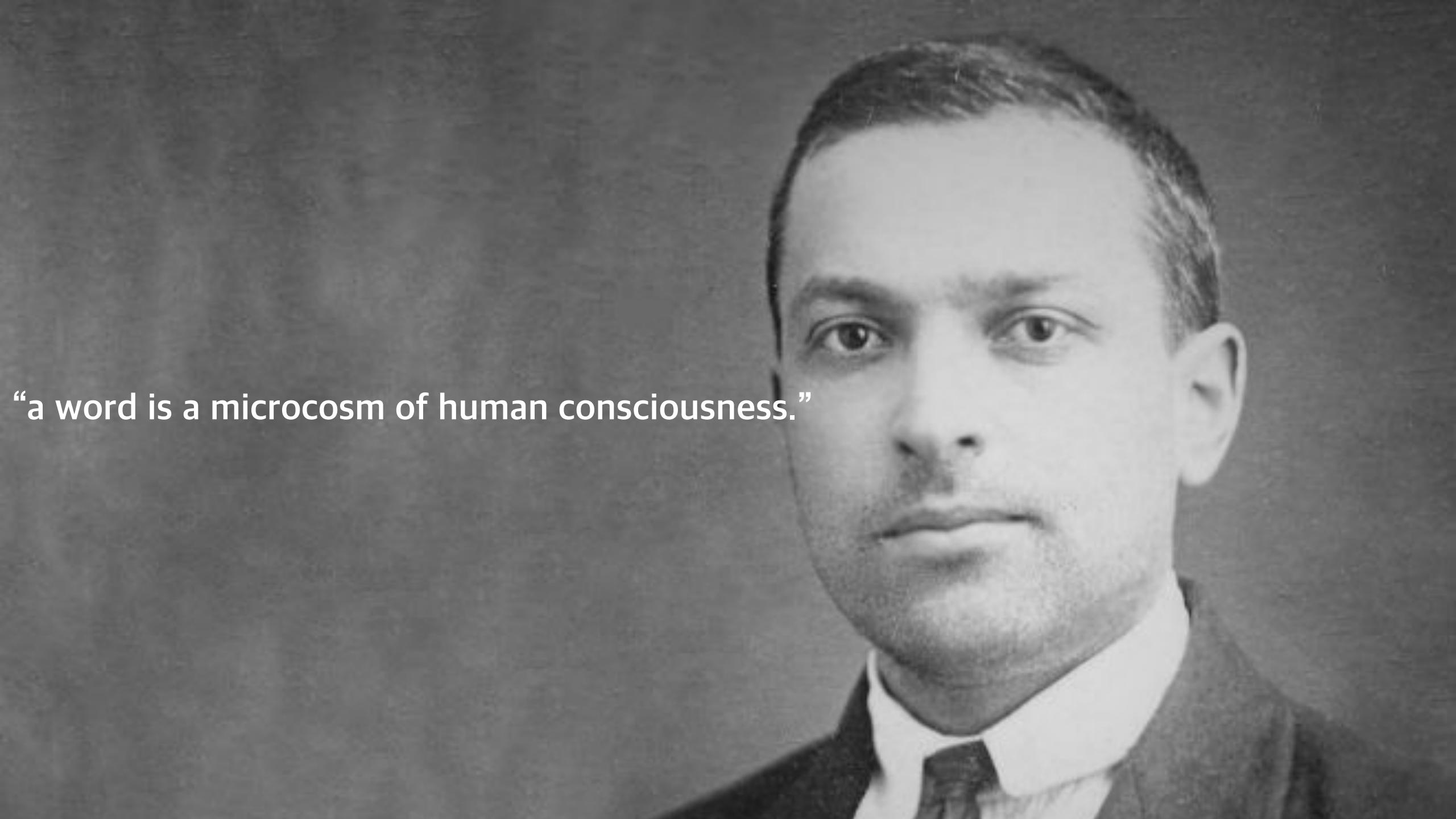
A practical tutorial



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A black and white portrait of a young man with short, dark hair, wearing a dark suit jacket, a white shirt, and a dark tie. He is looking slightly to his left with a neutral expression. The background is a plain, light-colored wall.

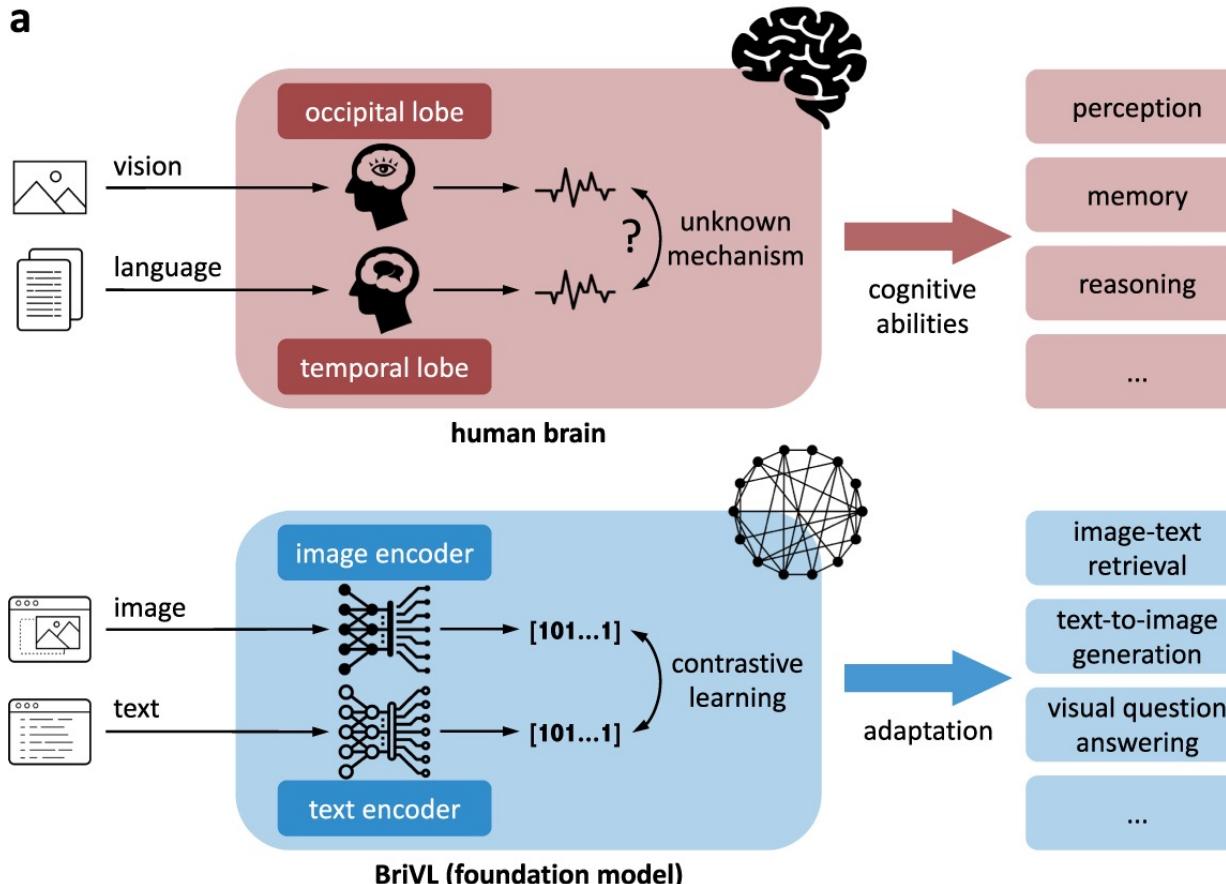
“a word is a microcosm of human consciousness.”



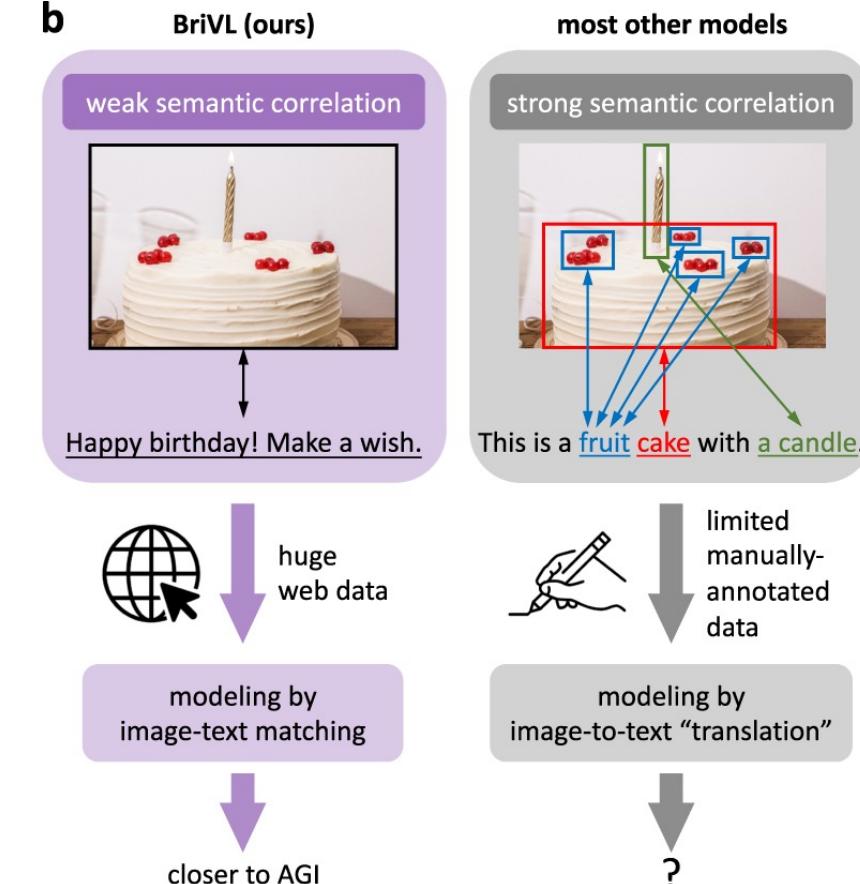
LLMs and Prompts

AI can do anything if it understands the intention of your statement.

a



b



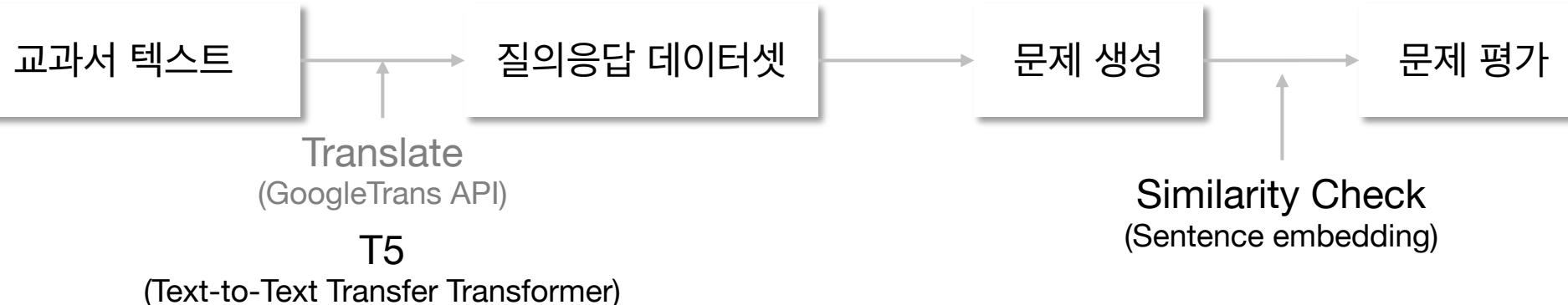
Fei et al. (2022). Towards artificial general intelligence via a multimodal foundation model. Nature Communications, 13, 3094.

The essence of multimodal AI is ‘texts’.



LLMs and Prompts

AI can do anything if it understands the intention of your statement.

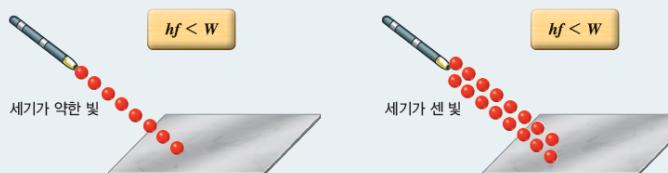


결과 1
해석

금속판에 쪼여 주는 빛의 진동수가 한계 진동수보다 작으면 광전류가 흐르지 않는다.

금속에서 전자를 떼어 내려면 일을 해 주어야 한다. 이때 금속에서 전자를 떼어 내는 데 필요한 최소한의 에너지를 일함수(W)라고 한다. 만약 광자 1개의 에너지가 금속의 일함수보다 작으면 전자를 떼어 낼 수 없다. 광전 효과는 한계 진동수보다 큰 진동수의 빛을 쪼여 주었을 때에만 일어나므로 한계 진동수가 f_0 인 광자 1개의 에너지는 금속의 일함수와 같다. ($W = hf_0$)

|그림 2-4| 와 같이 진동수가 한계 진동수보다 작은 빛($f < f_0$)은 광자 1개의 에너지가 금속의 일함수보다 작으므로 아무리 많은 수의 광자(세기가 센 빛)가 금속에 충돌하더라도 전자는 방출되지 않는다.



|그림 2-4 | 한계 진동수보다 작은 빛을 비출 때 광자의 개수가 많아지더라도 광전자가 방출되지 않는다.

“What is the minimum energy required to remove an electron from a metal?”

Work function

“What is the energy of one photon with the threshold frequency f ?”

Equal to the work function of the metal



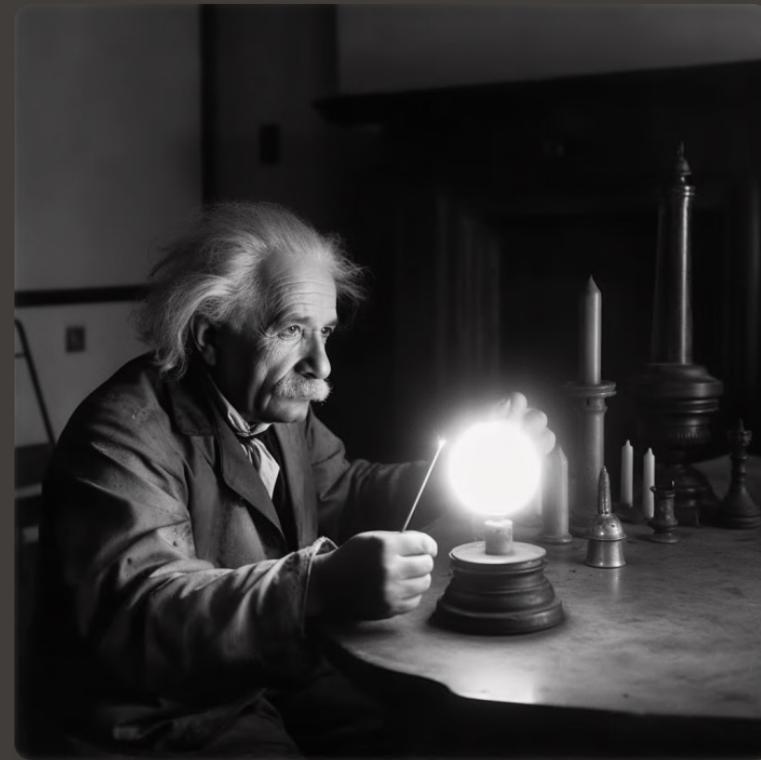
LLMs and Prompts

AI can do anything if it understand the intention of your statement.

Midjourney Bot ✓ 웃 Midjourney Bot einstein doing experiment of the photoelectric effect, photo, --v 5 - @heavenly.joseph (fast)

Midjourney Bot ✓ 웃 오늘 오후 3:00

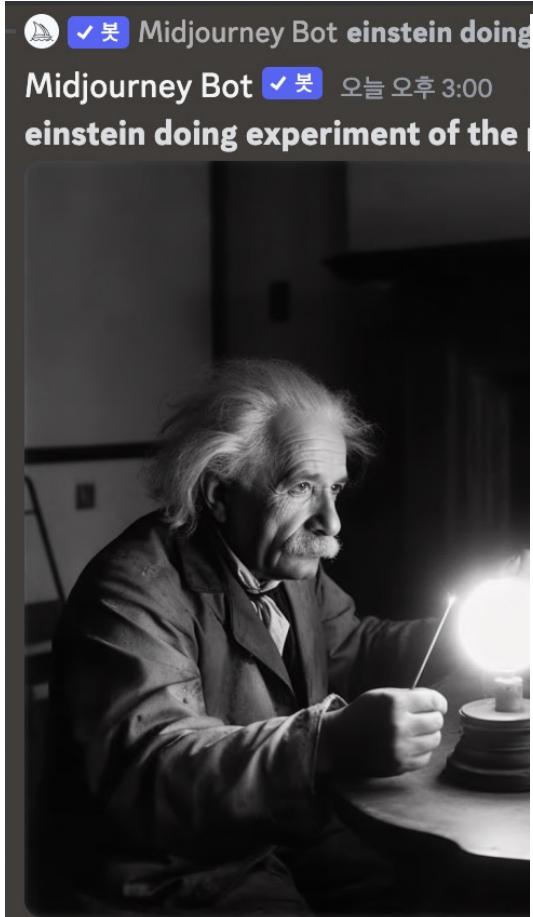
einstein doing experiment of the photoelectric effect, photo, --v 5 - Image #1 @heavenly.joseph





LLMs and Prompts

AI can do anything if it understand the intention of your statement.



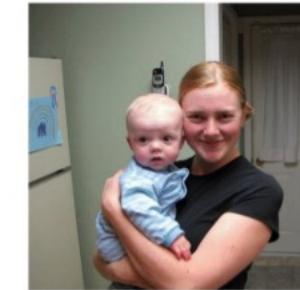
Who is wearing glasses?
man woman



Is the umbrella upside down?
yes no



Where is the child sitting?
fridge arms



How many children are in the bed?
2 1



Goyal et al. (2017). Making the V in VQA matter: Elevating the role of image understanding in visual question Answering. CVPR.

STEP

Understanding the process of NLP

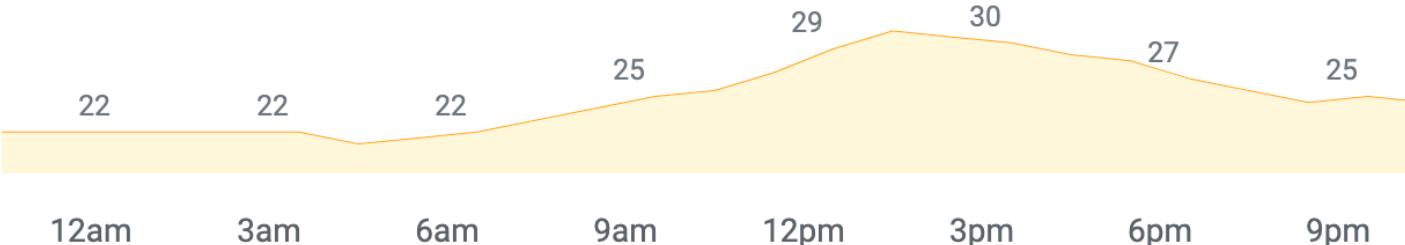
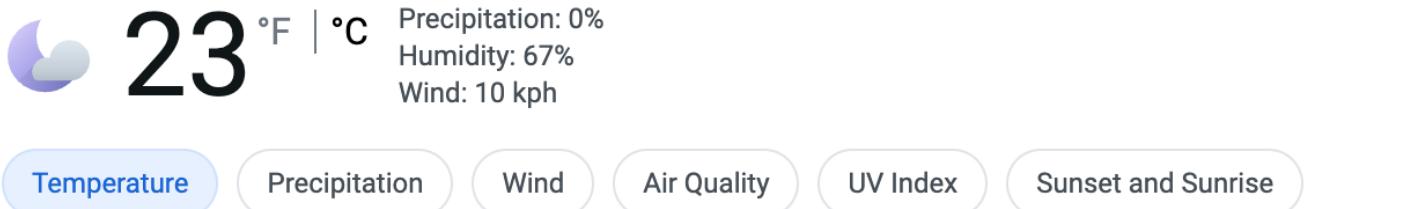


Fundamentals of NLP

Language reflects the characteristics of natural phenomena

Sydney, Australia

Partly cloudy, 10:25 PM



12am 3am 6am 9am 12pm 3pm 6pm 9pm

Today Mon Tue Wed Thu Fri Sat



26°

19°

31°

21°

37°

18°

37°

18°

23°

18°

25°

18°

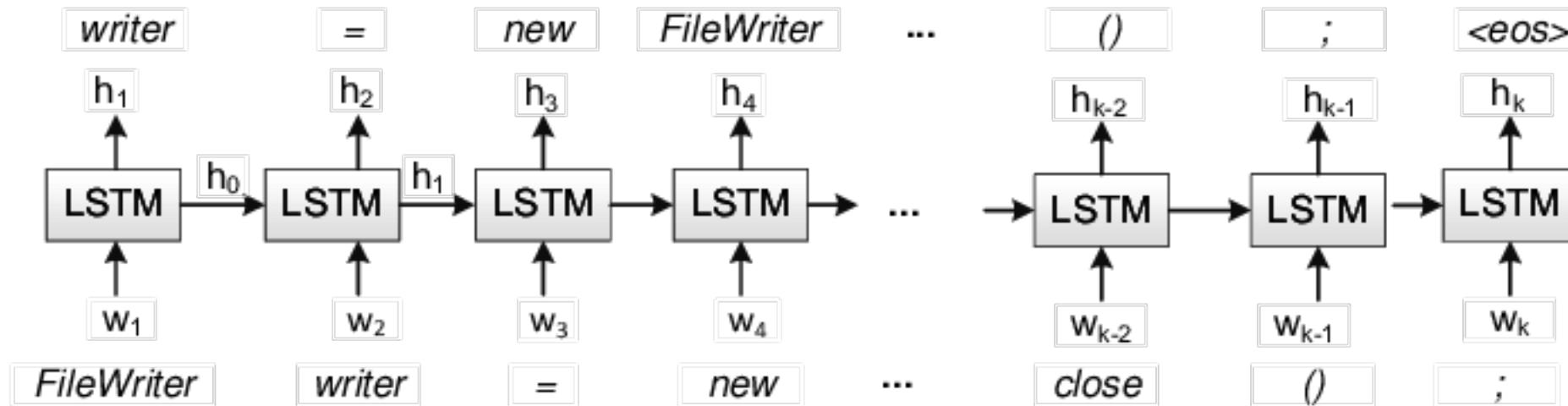
27°

18°



Fundamentals of NLP

Language reflects the characteristics of natural phenomena



Since photons do not carry an electric charge, their energy loss process within matter is independent of electrostatic forces and occurs through direct physical contact with atoms. Photons are physically much smaller than atoms. Therefore, they can freely penetrate materials until they interact with electrons or nuclei, and the probability of such interactions is very low. When a photon interacts with an atom or nucleus of a material, it can produce charged particles (electrons) capable of causing secondary ionization, which is why this type of radiation is called 'indirectly ionizing radiation.' Meanwhile, the distinction between gamma rays and X-rays is based solely on their source of origin – from the nucleus (gamma rays) or from outside the nucleus (X-rays) – although their properties and reactions with matter are the same.



Tokenization is a key process to split and analyze texts.

Tokenization, when applied to data security, is the process of substituting a sensitive data element with a non-sensitive equivalent, referred to as a token, that has no intrinsic or exploitable meaning or value. The token is a reference (i.e. identifier) that maps back to the sensitive data through a tokenization system. The mapping from original data to a token uses methods that render tokens infeasible to reverse in the absence of the tokenization system, for example using tokens created from random numbers. The tokenization system must be secured and validated using security best practices applicable to sensitive data protection, secure storage, audit, authentication and authorization. The tokenization system provides data processing applications with the authority and interfaces to request tokens, or detokenize back to sensitive data.

Word-based tokenization

Lemmatize: Tokenize

Corpus

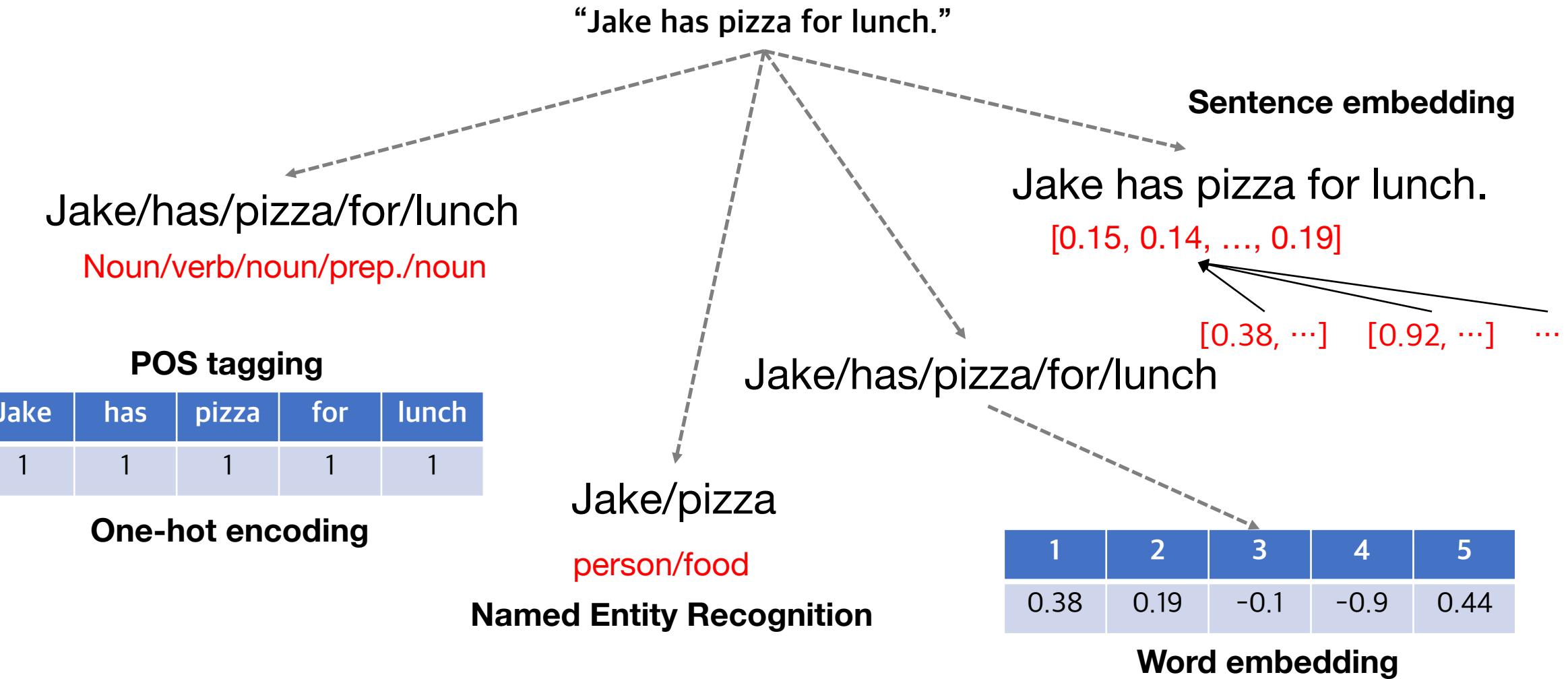
Sentence tokenization

Document/Text tokenization



Fundamentals of NLP

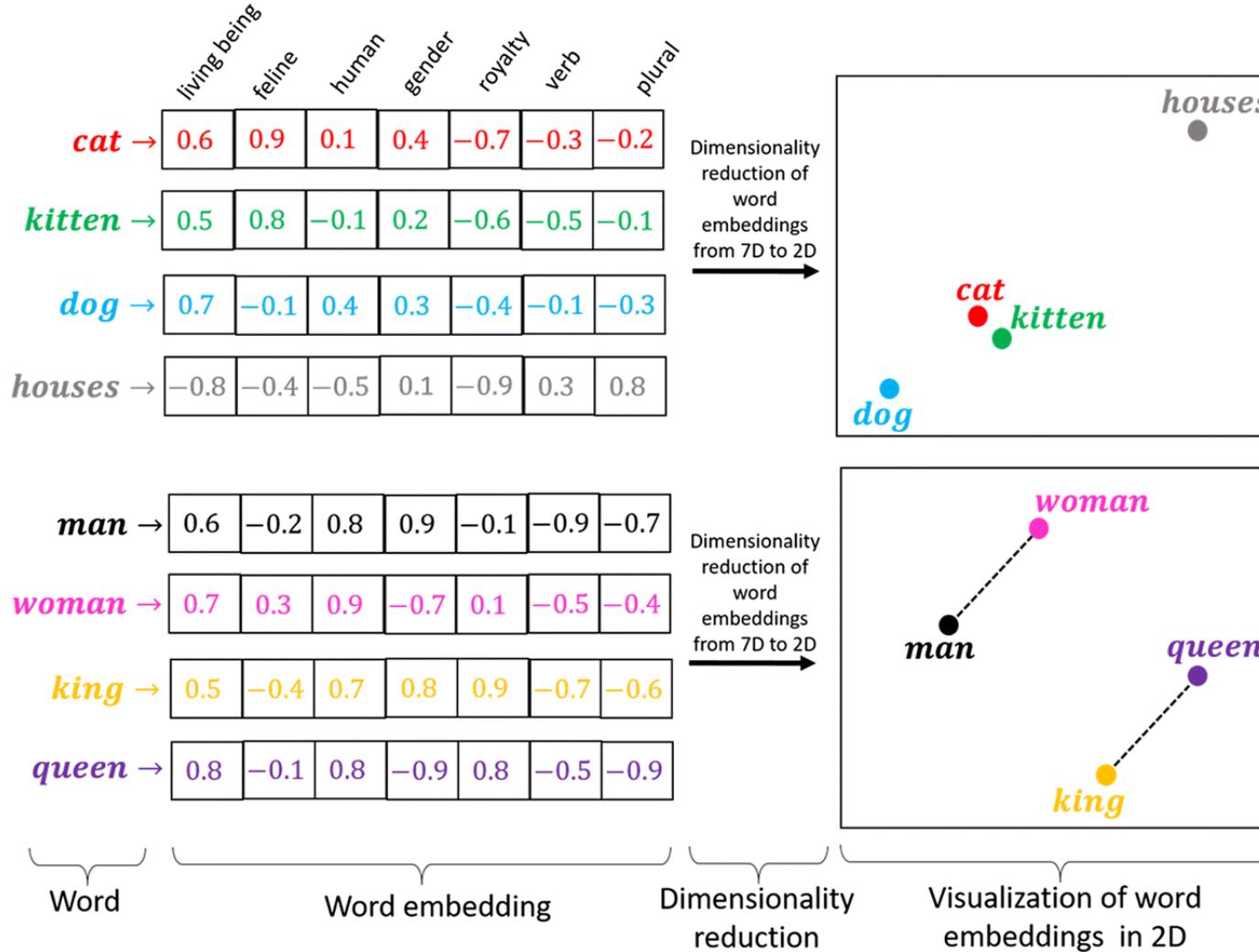
Any words/texts can be transformed into numerical data.





Fundamentals of NLP

Any words/texts can be transformed into numerical data.





Fundamentals of NLP

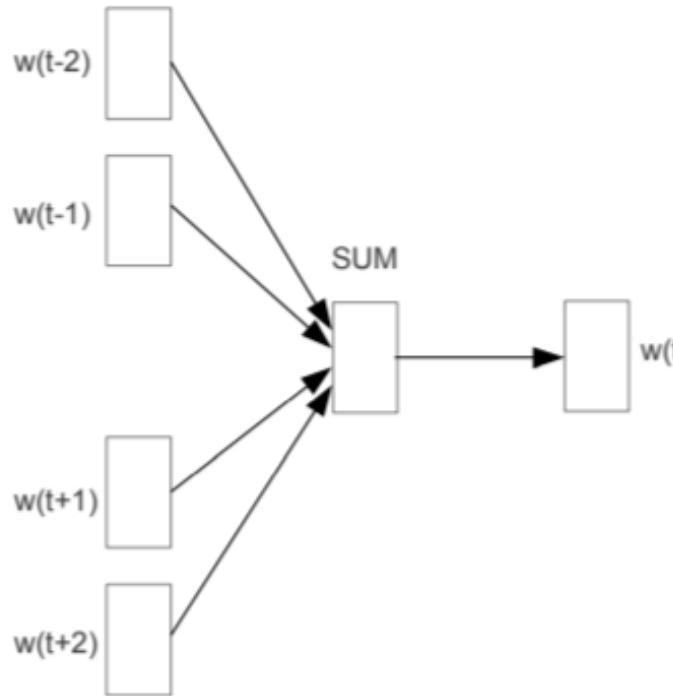
Dataset is a key to infer and generate text.

Strike when iron is

INPUT

PROJECTION

OUTPUT



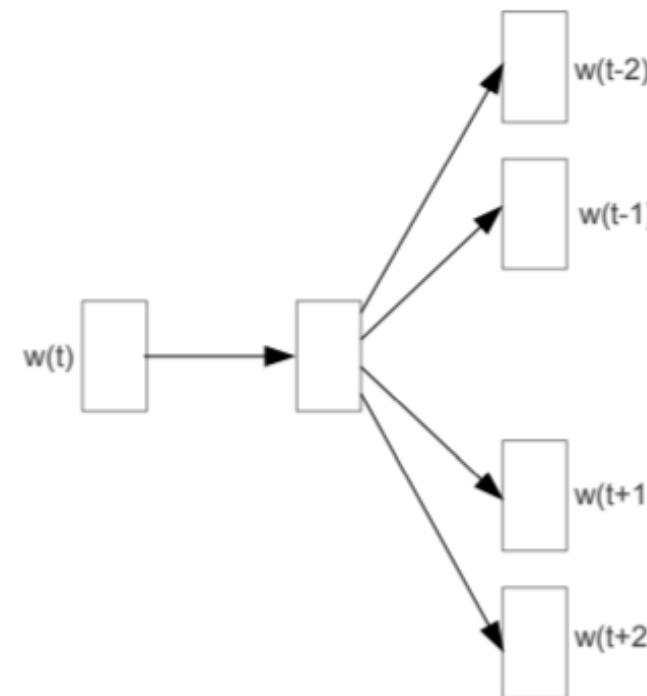
CBOW

Honesty

INPUT

PROJECTION

OUTPUT



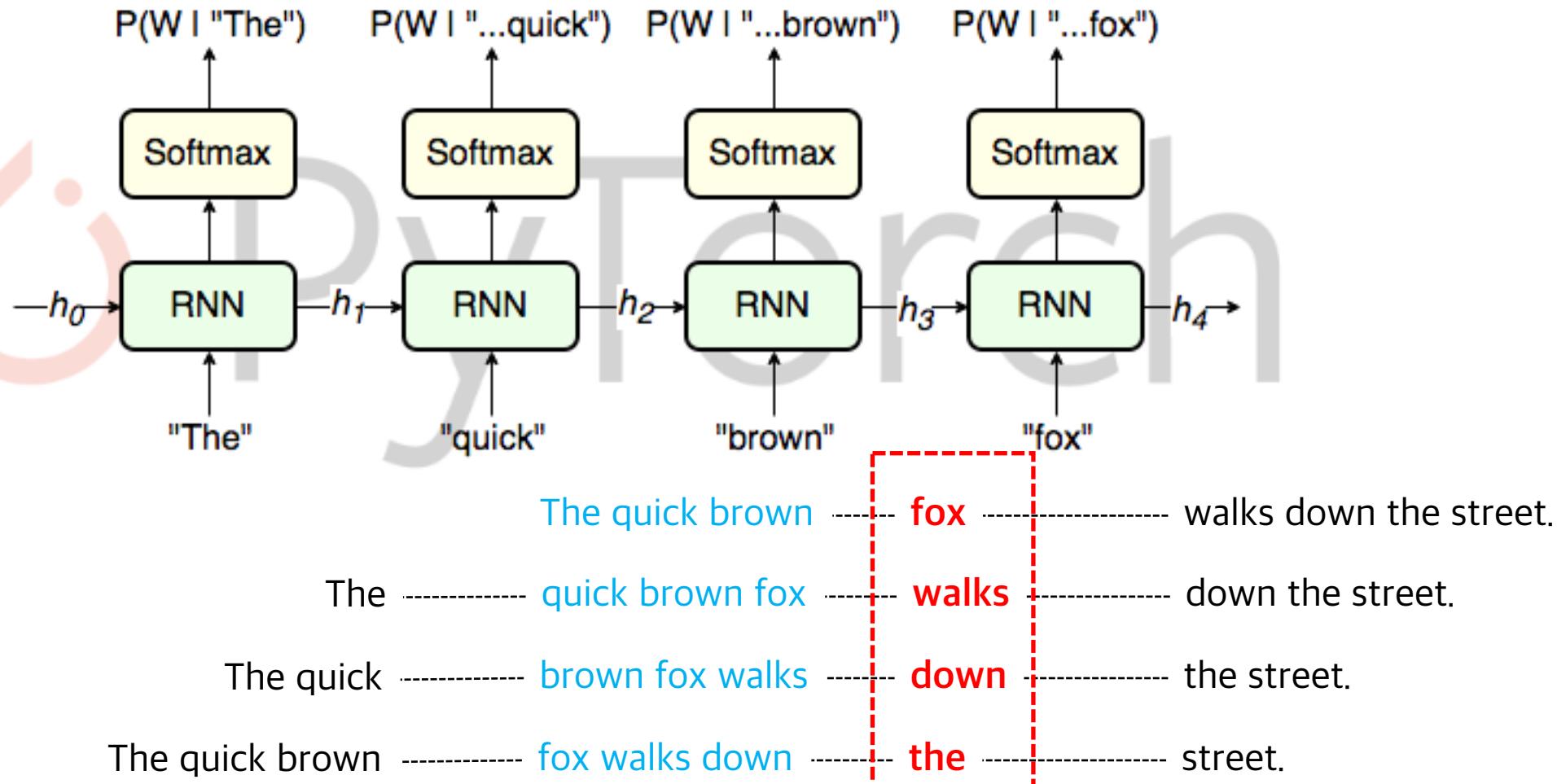
Skip-gram



Fundamentals of NLP

Dataset is a key to infer and generate text.

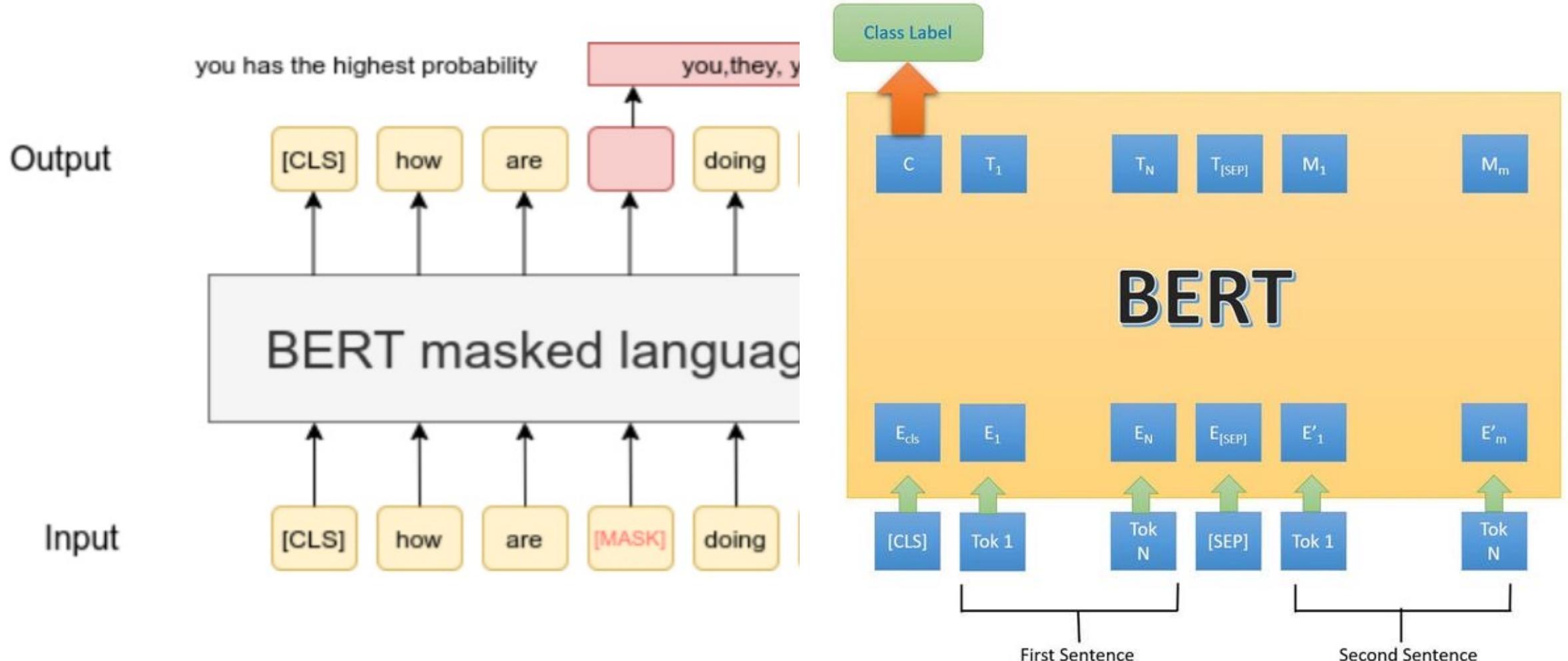
The quick brown fox walks down the street.





Fundamentals of NLP

Dataset is a key to infer and generate text.

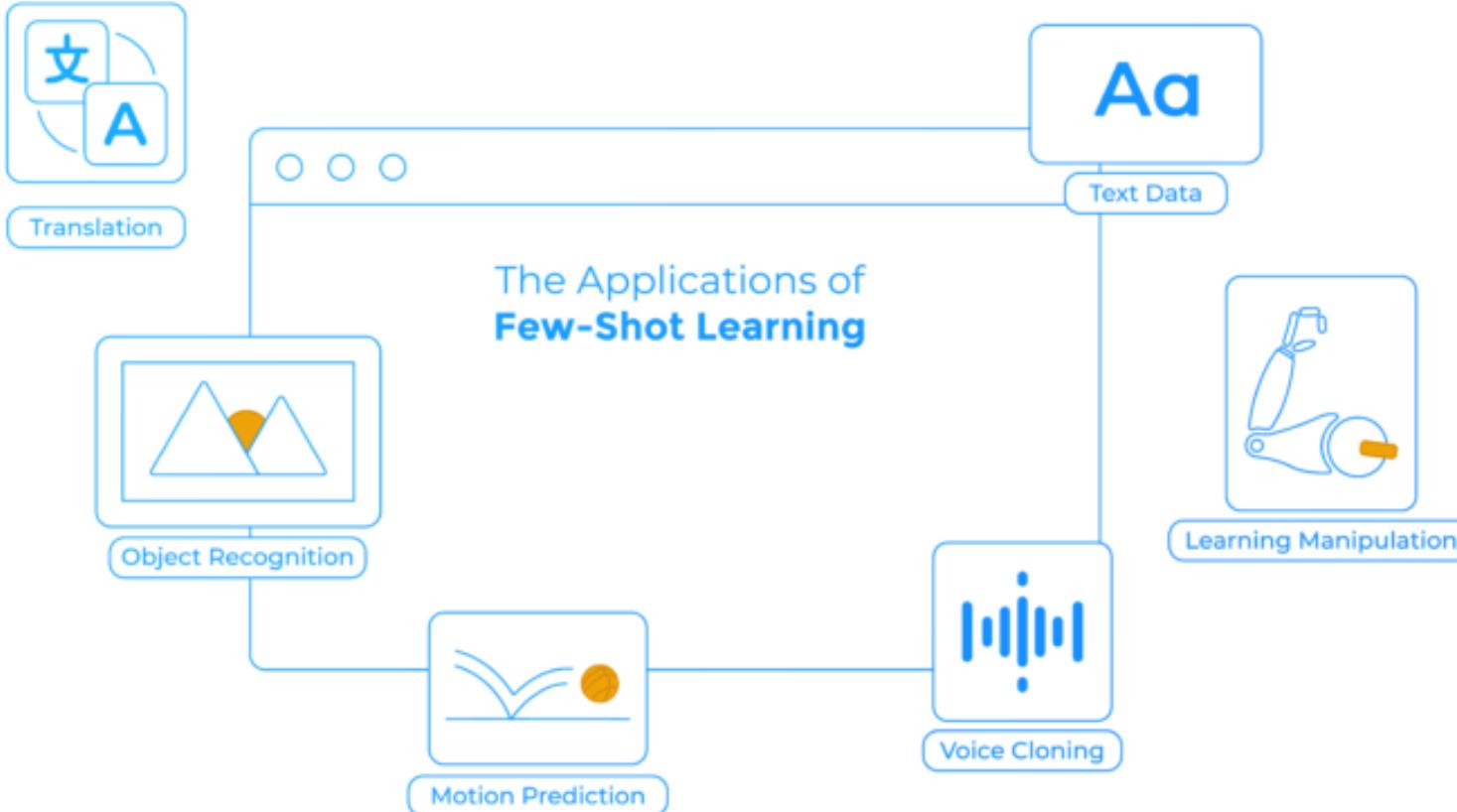




Fundamentals of NLP

It is not necessary to prepare a large amount of texts for training AI.

AI Multiple



STEP

Tips for how to use ChatGPT prompts

Prompt Tuning

Prompt tuning is the process of adapting LLMs to new tasks by training a small set of parameters known as prompts. These prompts are prepended to the input text to guide the LLM towards generating the desired output.



Tips for prompt engineering

You should pay if you get the better one.

Legacy (GPT-3.5)

The previous ChatGPT Plus model

Reasoning



Speed



Conciseness



Default (GPT-3.5)

Optimized for speed, currently available to Plus users

Reasoning



Speed



Conciseness



GPT-4

Our most advanced model, available to Plus subscribers.

GPT-4 excels at tasks that require advanced reasoning, complex instruction understanding, and more creativity.

Reasoning



Speed



Conciseness





Tips for prompt engineering

More detailed prompt gets better quality of answers.

조

You

tell me what the photoelectric effect is.

조

You

I'm physics teacher at a middle school. I'd like to explain about the photoelectric effect to students. Give me its explanation with plain words for students.



ChatGPT

The photoelectric effect is a phenomenon in physics where light or other electromagnetic radiation causes the emission of electrons from a material. This effect is significant for several reasons:

1. **Quantum Nature of Light:** The photoelectric effect was one of the first experiments that showed light can behave as both a wave and a particle. It provided evidence for the quantum nature of light, where light can be thought of as consisting of particles called photons.
2. **Emission of Electrons:** When light of a certain frequency (or higher) shines on the surface of a material, such as metal, it can cause the metal to emit electrons. These ejected electrons are known as photoelectrons.
3. **Threshold Frequency:** There is a minimum frequency of light (threshold frequency) below which no electrons are emitted, regardless of the intensity of the light. This cannot be explained by classical wave theories of light, which predicted that the energy carried by light waves would depend solely on their intensity.
4. **Einstein's Explanation and the Nobel Prize:** Albert Einstein provided a theoretical explanation for the photoelectric effect, which played a crucial role in the development of quantum mechanics. He proposed that light is made up of individual quanta (photons) that have energy proportional to their frequency. Einstein won the Nobel Prize in Physics in 1921 for his explanation of the photoelectric effect.
5. **Energy and Intensity Relationship:** The kinetic energy of the emitted electrons depends on the frequency of the incident light and not on its intensity. A higher frequency (above the threshold) increases the kinetic energy of the photoelectrons, while a higher intensity of light increases the number of photoelectrons emitted but not their energy.
6. **Applications:** The photoelectric effect has practical applications in various fields, including the development of photoelectric cells and solar panels, where light is converted into electrical energy.

조

You

tell me what the photoelectric effect is.

In summary, the photoelectric effect is an important concept in quantum physics, demonstrating the particle-like behavior of light and leading to significant advancements in our understanding of the fundamental nature of light and electrons.

조

You

I'm physics teacher at a middle school. I'd like to explain about the photo to students. Give me its explanation with plain words for students.



ChatGPT

Sure! Explaining the photoelectric effect to middle school students can be fun and engaging. Here's a simplified explanation:

Imagine light as a bunch of tiny, invisible energy packets called 'photons'. These photons are like tiny energy balls that move really fast. Now, think of a metal surface as a place where lots of tiny particles called 'electrons' live. These electrons are super tiny and are a part of everything around us.

When the light (or these energy balls) hits the metal surface, something cool happens. If the light has enough energy (which means the photons are really strong), they can knock the electrons off the metal. This is like hitting a baseball with a bat - if you hit it hard enough, the ball flies off.

But here's the catch: not all light can do this. Only light that is strong enough (like sunlight or a really bright lamp, but not a dim light) can knock the electrons off. This is because the light needs to have a certain amount of energy to do the job. If the light isn't strong enough, no matter how long it shines on the metal, the electrons won't budge.

This whole thing is what we call the 'photoelectric effect'. It's like a special dance between light and electrons - the light has to be just right to get the electrons moving. And it's super important because it helps us understand that light acts like both a wave and a bunch of particles, which is a really cool thing in science!

This effect is not just a cool science fact; it's used in lots of things in our daily life, like solar panels that turn sunlight into electricity. So, the photoelectric effect is a great example of how understanding something small can lead to big inventions and discoveries.





Tips for prompt engineering

You can improve the quality of answers by giving one or more examples.



You

This is an example for analyzing argumentative elements from students' text.

Text: Cells are very similar to factories. To stay alive and function properly, cells have a division of labor similar to that found in factories. Here, we will examine cells as protein-producing factories. All eukaryotic cells are composed of a plasma membrane, a nucleus, and cytoplasm.

Claim: Cells are very similar to factories.

Data: Here, we will examine cells as protein-producing factories. All eukaryotic cells are composed of a plasma membrane, a nucleus, and cytoplasm.

Warrant: To stay alive and function properly, cells have a division of labor similar to that found in factories.

Backing: None.

Qualifier: None.

Rebuttal: None.

Extract argumentative elements from the text in the following:

Cell gave parts that performs different function just like a factory. Cell also have needs in order to work and also produces by products just like a factory. Cell have cell wall that support while factory have a wall, ER that transport proteins like a delivery truck, vacuole that stores food and water just like a storage that store supplies.



ChatGPT

Based on the provided text, here's the analysis of its argumentative elements:

Claim: Cells are very similar to factories.

Data: Cells have parts that perform different functions just like a factory. They have a cell wall for support (similar to a factory's walls), an endoplasmic reticulum (ER) that transports proteins like a delivery truck, and vacuoles for storing food and water, akin to a storage area in a factory.

Warrant: The analogy is drawn on the basis of functional similarities between cell components and factory elements. For example, the cell wall provides structural support like the walls of a factory, the ER functions in transportation of materials within the cell akin to delivery trucks in a factory, and vacuoles serve as storage units, comparable to storage areas in a factory.

Backing: This element is not explicitly provided in the text, but it could include biological knowledge and research that supports the functional similarities between cell components and factory parts.

Qualifier: None provided in the text. However, it could be implied that this analogy works best when considering the specific functions mentioned (support, transport, storage) rather than a direct one-to-one comparison of a cell to a factory in all aspects.

Rebuttal: No rebuttal is provided in the text. A potential rebuttal could involve pointing out differences between cells and factories that challenge the simplicity of this analogy, such as the complexity of biological processes compared to mechanical processes in a factory.



Tips for prompt engineering

You can ask multiple actions such as 'chained process'.

조

You

Now you are a biology teacher.

Ask three questions, one by one.

If the answer is correct, applause me and move to the next question. Otherwise, give me some tips for the right answer and ask me the same question until I have got the correct answer.

These are three questions you have to ask me.

Question 1: Which of the following organisms perform photosynthesis?

- a) pine tree
- b) snail
- c) corona virus
- d) granite

Question 2: What three elements do plants need for photosynthesis?

Question 3: Does temperature influence the photosynthesis? Say yes or no with the reason.

| | | | | | | | |
|--|--|---|--|--|--|--|--|
|  ChatGPT | Alright, let's start with a question! 🌱 |  ChatGPT | Correct! 🎉 Applause! Plants, use photosynthesis to move on to the next question. |  ChatGPT | Close, but not quite. Plants take in from the environment. |  ChatGPT | That's absolutely correct! 🎉 Applause for you! For photosynthesis, plants indeed need sunlight, water, and carbon dioxide. Excellent job! Now, let's proceed to the final question. |
| Question 1: | Ask: "Which of the following organisms perform photosynthesis?" | Answer: a) Pine tree b) Snail c) Corona virus d) Granite | Question 2: | Ask: "What three things do plants need for photosynthesis?" | Answer: Please provide your answer when you're ready. | Question 3: | Ask: "Does temperature influence photosynthesis? Say yes or no with the reason." |
| (Once you provide an answer, we'll move on to the next question.) |  You sun, water, oxygen |  You What's your answer? |  You yes, photosynthesis is sensitive about temperature, such as hot and cold weather. |  ChatGPT | That's not quite right. Remember, we're looking for an organism that can produce its own food using sunlight through the process of photosynthesis. Among the options, which one is a plant and capable of doing this? |  ChatGPT | Yes, that's correct! 🙌 Applause! Temperature does indeed influence photosynthesis. You're right to point out that it's sensitive to hot and cold conditions. To add a bit more detail, the rate of photosynthesis is affected because the enzymes that assist in the process work best within a certain temperature range. Too hot or too cold, and their efficiency can decrease, affecting the overall photosynthesis process. |
| Let's try the question again: | Question 1: "Which of the following organisms perform photosynthesis?" | Answer: a) Pine tree | Great work on answering all three questions! You've shown a good understanding of these key concepts in biology. If you have any more questions or need further clarification, feel free to ask! | | | | |



Tips for prompt engineering

You can have some formats about what you want to get.

The screenshot shows a web browser window with the URL au.finance.yahoo.com/news/lower-interest-rates-coming-does-120355732.html. The page title is "Lower interest rates are coming. What does that mean for my money?". The article is by Daniel de Visé, USA TODAY, published on Sun, 17 December 2023 at 11:03 pm AEDT. The content discusses the Fed's rate hike campaign and its impact on investors. On the right side of the page, there is a promotional banner for yahoo! mail with the text "Treat yourself to an inbox upgrade" and a "Try it now" button. Below the banner, there is a "TRENDING" section with three numbered items.

Lower interest rates are coming. What does that mean for my money?

f

Daniel de Visé, USA TODAY

Sun, 17 December 2023 at 11:03 pm AEDT · 6-min read

X

✉

Interest rates are [higher than they've been](#) in more than 20 years after a historic run of rate hikes by the Fed to cool surging inflation.

But the campaign of rate increases is probably over, [Federal Reserve Chair Jerome Powell signaled on Wednesday](#). What's more, Fed officials predict they will lower the benchmark federal funds rate by three-quarters of a percentage point next year, bringing it down from a [22-year high of 5.25% to 5.5%](#) to a range of 4.5% to 4.75%.

How should ordinary American investors respond?

"Your finances are all tied in some way to interest rates, and the anticipation of lower interest rates could lead to a vastly different financial landscape than we are seeing today," said [Jordan Gilberti](#), a certified financial planner in Baltimore.

yahoo!⁺
mail

Treat yourself
to an inbox
upgrade

Try it now

TRENDING

- Landlord's 'ridiculous' \$50K insurance proposal for Aussie renters
- Will retiree's unusual tax claim after selling home at a loss mean you could get hit with extra tax burden?
- Why I bought Bitcoin and how I



Tips for prompt engineering

You can have some formats about what you want to get.



You

This is an url for an article about national interest.

<https://au.finance.yahoo.com/news/lower-interest-rates-ahead-091222.html>

Who is Jerome Powell? and what is his main argument?

The output format is as follows:

Jerome Powell:{result}

Main argument:{result}

Evidence:{result}



ChatGPT



Error analyzing ▾

Jerome Powell:

Jerome Powell is the Chair of the Federal Reserve, the central bank of the United States. He plays a crucial role in determining the nation's monetary policies.

Main Argument:

Jerome Powell's main argument, as indicated in the article, is that the phase of increasing interest rates is likely over. The Federal Reserve, under his guidance, is signaling a shift in its monetary policy approach.

Evidence:

The evidence for this argument is the announcement that the Federal Reserve plans to lower the benchmark federal funds rate by three-quarters of a percentage point in the following year. This move is seen as an effort to bring down the rate from its 22-year high of between 5.25% to 5.5% to a range of 4.5% to 4.75% [1] [2].

STEP

Better tips for ChatGPT: Using API



Tips for How to use ChatGPT with API

Why should I use API instead of web pages?

It helps to implement tasks that need to be performed repeatedly in an easy and simple way.

It can be implemented as a platform or service that allows students to respond more easily.

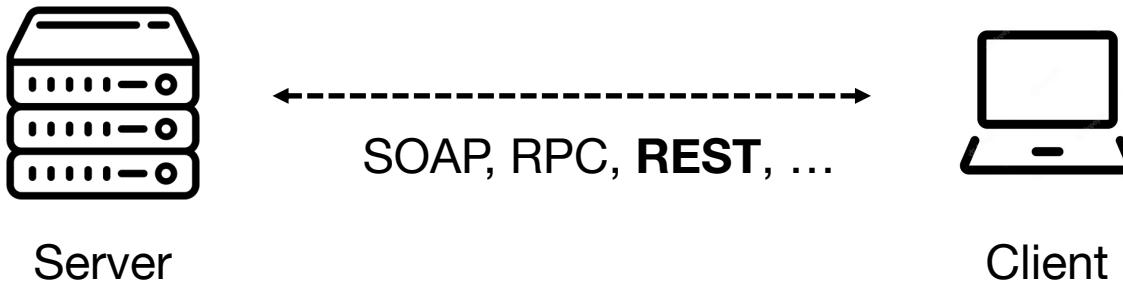
It can store and analyse records and experiences related to students' learning.

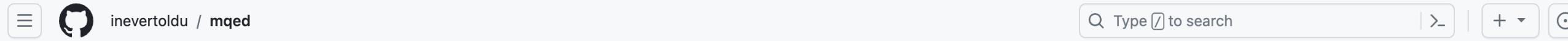


Tips for How to use ChatGPT with API

What is API(Application Programming Interface)?

An API is a set of rules and protocols for building and interacting with software applications. Think of it as a mediator that allows different software programs to communicate with each other.





main ▾ 1 Branch 0 Tags Go to file Add file ▾ <> Code ▾

| | | |
|---|----------------------|------------|
|  inevertoldu Update README.md | 037ff81 · 2 days ago | 12 Commits |
|  personal update | 3 days ago | |
|  sample_db update | 3 days ago | |
|  .DS_Store Create .DS_Store | 2 days ago | |
|  01 fundamentals of llm.ipynb Add files via upload | 3 days ago | |
|  README.md Update README.md | 2 days ago | |
|  requirements.txt Create requirements.txt | 3 days ago | |

README



How to use python and LLM(ChatGPT) in educational settings

About

Guidelines for how to use LLMs in educational settings (Python)

Readme

Activity

0 stars

1 watching

0 forks

Releases

No releases published

[Create a new release](#)

Packages

No packages published

[Publish your first package](#)

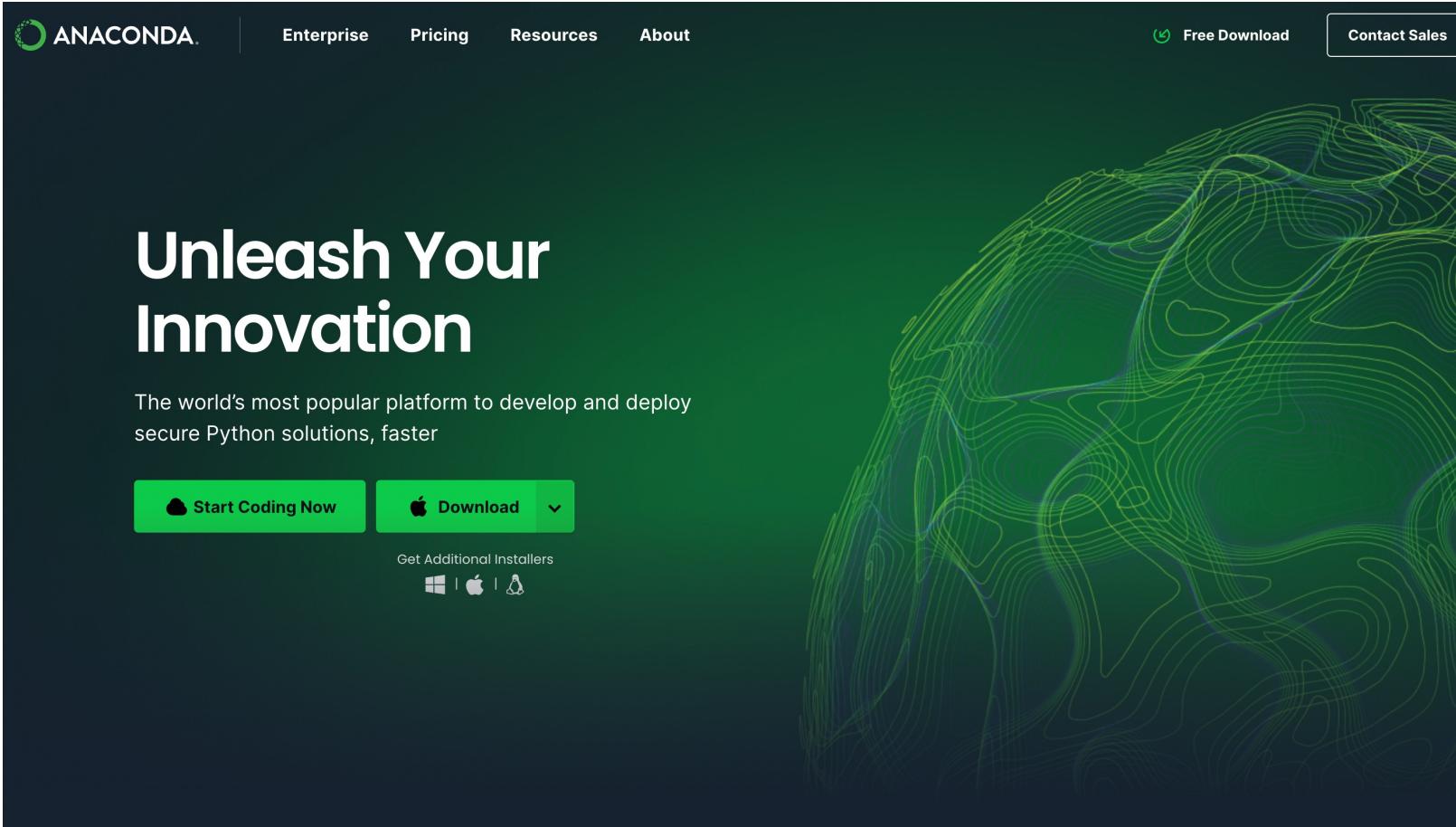
Languages



Tips for How to use ChatGPT with API

What to do before using API

1. Install python and virtual environment



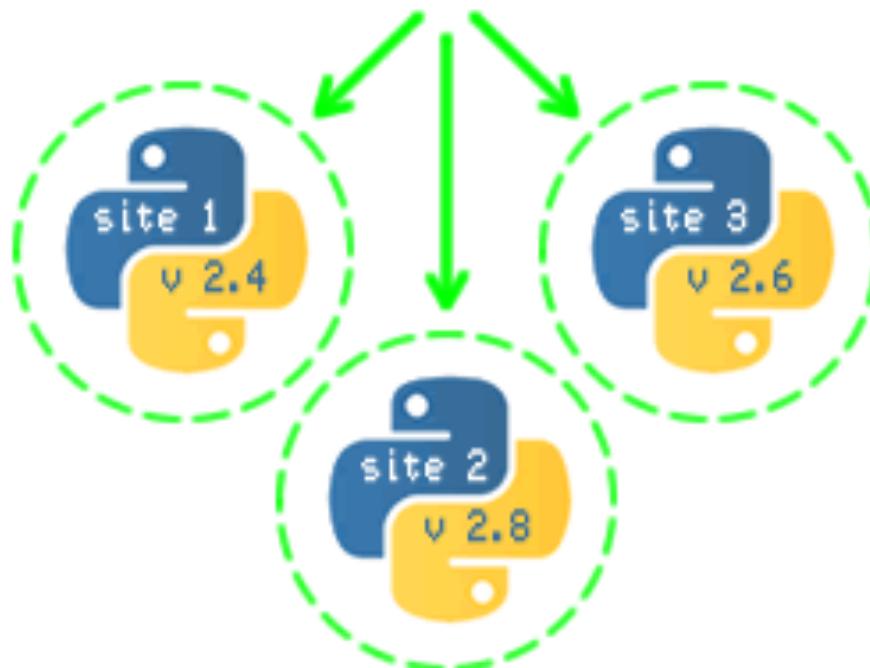


Tips for How to use ChatGPT with API

What to do before using API

Even different version of a library requires different dependencies, which may bring about some errors.

> **virtualenv**





Tips for How to use ChatGPT with API

What to do before using API

Useful commands for anaconda

Create a new environment

conda create -n [name] python=[version]

conda create -n mqed python=3.11

Activate a virtual environment

conda activate [name]

conda activate mqed

Deactivate a virtual environment

conda deactivate

Check created environments

conda info --env

Remove a virtual environment

conda remove [name]

conda remove mqed



Tips for How to use ChatGPT with API

What to do before using API

2. Install libraries to run your codes

(1) Find out installed libraries `pip list`

(2) Install a library `pip install [name]`

`pip install -r requirements.txt`



Tips for How to use ChatGPT with API

What to do before using API

3. Prepare your own API key

The screenshot shows the OpenAI platform homepage at platform.openai.com. The main navigation bar includes links for Overview, Documentation, API reference, Examples, and Playground. A banner at the top states: "At OpenAI, protecting user data is fundamental to our mission. We do not train our models on inputs and outputs through our API." Below this, there are sections for "Welcome to the OpenAI platform", "Start with the basics" (Quickstart tutorial and Examples), and "Build an application" (GPT, GPT best practices, Embeddings, and Speech to text). The "API keys" section is visible on the right side of the page.

API keys

Your secret API keys are listed below. Please note that we do not display your secret API keys again after you generate them.

Do not share your API key with others, or expose it in the browser or other client-side code. In order to protect the security of your account, OpenAI may also automatically rotate any API key that we've found has leaked publicly.

SECRET KEYS

sk-...f4l...
sk-...uvBN...
sk-...QeZq...

SECRET KEY

sk-...f4l...
sk-...uvBN...
sk-...QeZq...
sk-...rAHC...

Default organization

If you belong to multiple organizations, this setting controls which organization is used by default when making requests with the API keys above.

Personal organization

Note: You can change this setting at any time.

API key generated! X

Help Personal

API keys

Your secret API keys are listed below. Please note that we do not display your secret API keys again after you generate them.

Do not share your API key with others, or expose it in the browser or other client-side code. In order to protect the security of your account, OpenAI may also automatically rotate any API key that we've found has leaked publicly.

SECRET KEY

sk-...f4l...
sk-...uvBN...
sk-...QeZq...
sk-...rAHC...

CREATED

sk-...f4l...

sk-...uvBN...

sk-...QeZq...

sk-...rAHC...

LAST USED

sk-...f4l...

sk-...uvBN...

sk-...QeZq...

sk-...rAHC...

API key generated

Please save this secret key somewhere safe and accessible. For security reasons, **you won't be able to view it again** through your OpenAI account. If you lose this secret key, you'll need to generate a new one.

sk-57ZhSkLegOmAOFbPBhHnT3BibkFJOkjBd9yRtrZ92kbOrAt



OK

Default organization

If you belong to multiple organizations, this setting controls which organization is used by default when making requests with the API keys above.



Tips for How to use ChatGPT with API

What to do before using API

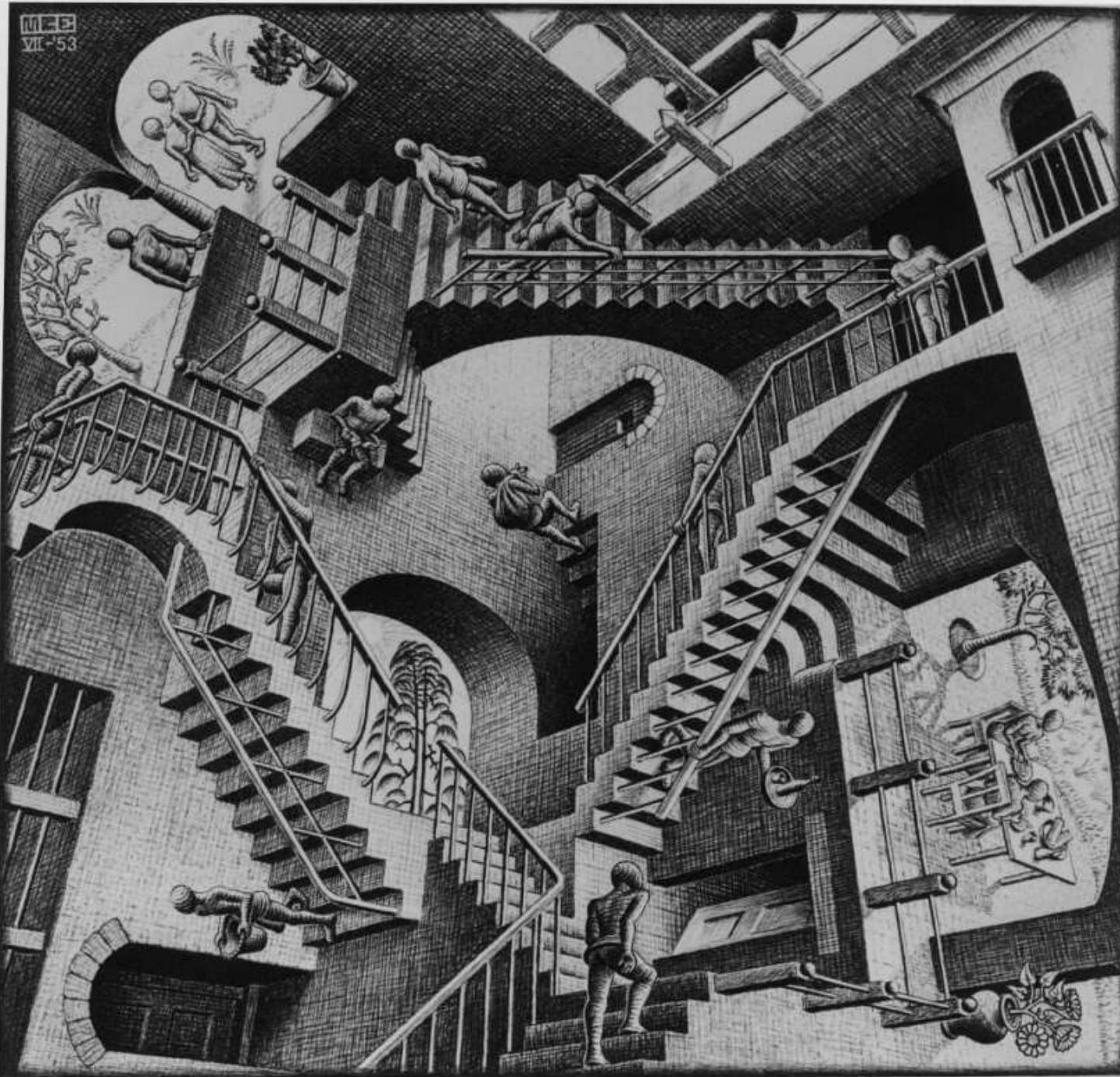
4. Create '.env' on your local folder.

A screenshot of a dark-themed code editor, likely VS Code, showing a .env file. The file contains two lines of code:

```
1 OPENAI_API_KEY=
2 GOOGLE_API_KEY=
```

The code editor interface includes a toolbar with icons for file operations, a search bar at the top, and a sidebar on the left with various icons.

**there is nothing new under the sun.
Is there anything of which one can say,
"Look! This is something new"?
It was here already, long ago;
it was here before our time.**





THANK YOU