

# Cut Your Study Time **in Half** - Mastering **AI Study Tools** like Memo and Others

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香港大學三年級  
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Med

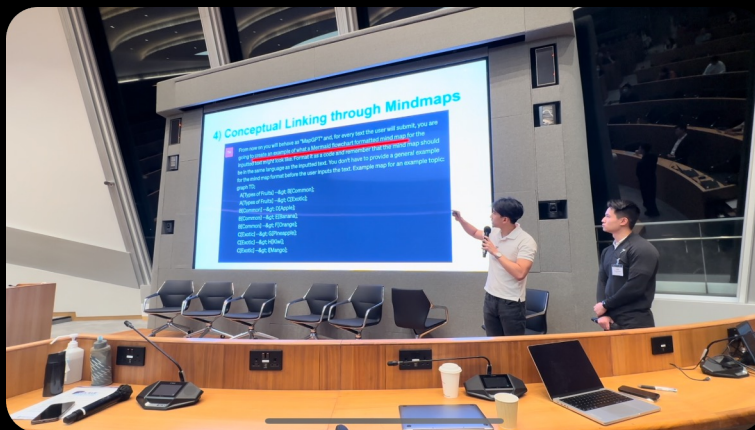
Memo 人工智能  
學習軟聯合創辦人



memo



陳志誠  
Jason Chan



# Learning outcomes

**After this seminar, you will be able to:**

1. Transform your study materials into effective flashcards and learning resources using AI tools like App Memo
2. Apply evidence-based study techniques, including active recall and spaced repetition, in your daily learning
3. Optimize your study workflow using AI applications to reduce content creation time by 50%
4. Customize AI-generated learning materials to match your personal learning style
5. Transfer learned AI study principles across different learning platforms and tools



# Problem

Universal challenge: Students often **forget** what they learn.

Remembering takes practice and often require a **long time**

Traditional education **do not teach** students memory techniques



# Proven Memory Techniques



## Active Recall & Space Repetition

Dunlosky and colleagues (2013) identified **practice testing** (or practice retrieval) and **distributed practicing** (or spaced practice) as the two most effective techniques.



## Improve Grades

Use of flashcard as self-testing technique is **positively associated with GPA** (Dunlosky & Hartwig 2012)



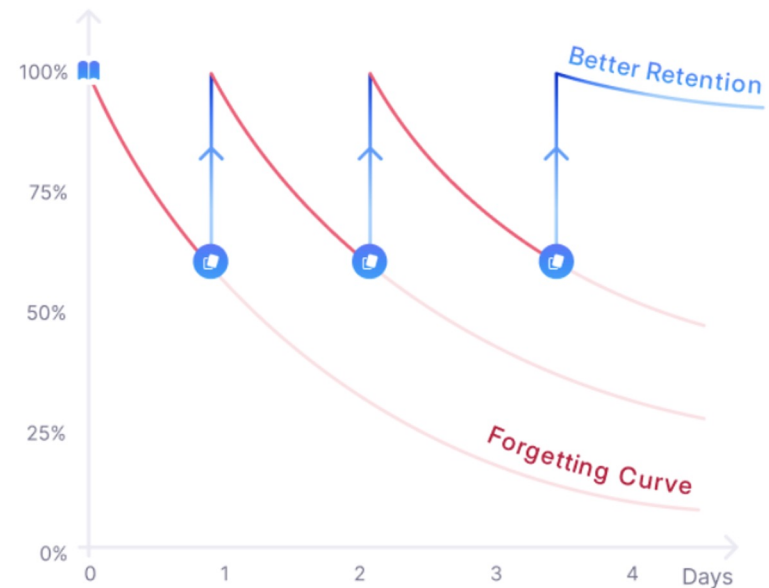
## Boosts memory retention

Retrieval practice with flashcard increases the **retention of information** (Roediger et al 2006)



## Gamification in education

Gamification in education **enhances learners' motivation, problem-solving abilities**, decision-making abilities, and social skills (Kim & Park 2021)



# A Note from Us

Until now, study tools for students have been scattered and inefficient. Flashcards, practice tests, note-taking apps, and AI assistants all serve a purpose, but juggling multiple platforms is cumbersome and expensive for modern learners.

# The Student Mental Health Crisis

Students are undergoing **more stress than ever before**. Over 4 in 5, or more specifically, **80% of college seniors** have reported experiencing **burnout** during their undergraduate years.

In Hong Kong, secondary school students are under **more pressure than ever before**.

**1.6% of secondary students attempted suicide** in the last academic year, reflecting the **severe impact of stress** on students' mental health.

# The Root Cause

The problem is students were never taught how to learn. They were never taught how to study. They were never taught how to take notes. They were never taught how to memorize.

And we want to change that.

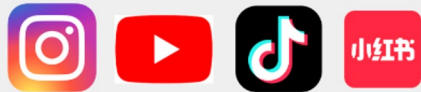


## Our Journey

We launched Memo to solve our own problem of spending hours making Anki flashcards in medical school and it quickly became the fastest-growing educational app. And soon we are building something bigger. 🙄

- 📖 Now, we have over 60,000 active monthly users
- 🚀 We're growing 10% month-over-month
- 🌱 We are completely bootstrapped and profitable
- 💡 We are fast-paced, passionate and are 100% remote-friendly

20+ million views



PRODUCT HUNT  
#1 Product of the Day

70+ countries



150,000 users



**memo**

106+ disciplines

medicine      nursing      physiotherapy  
law      biomedical sciences      language learning



**backed**

(click logo to learn more )

students are from



HARVARD  
UNIVERSITY



UNIVERSITY OF  
OXFORD



香港大學  
THE UNIVERSITY OF HONG KONG



香港中文大學  
The Chinese University of Hong Kong

Media coverage



(click logo to learn more )

## 港大醫科生研AI製溫習Flash Card 吸全球10萬用戶

創科線

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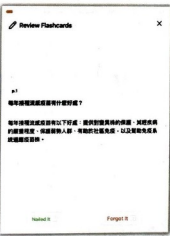
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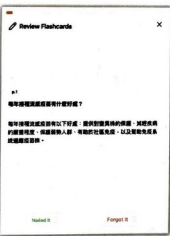
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# 龐大課本知識量如何記入腦？

## 港大醫科生自資研發 AI生成「記憶卡」

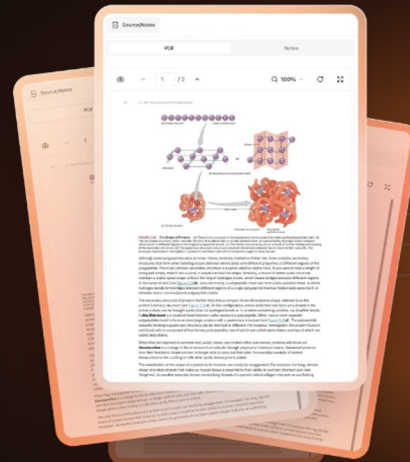
### 助學生溫習 鞏固長期記憶

#### 吸全球十萬用戶 牛津劍橋生都用

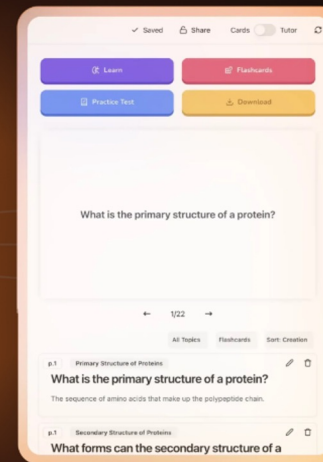
港大醫科二年級生張天俊

港大醫科二年級生陳志誠

# Cut your study time *in half* with ai



click to get started for free







# Turn PDFs into instant study materials with AI



Flashcards

Notes

MCQs

Cloze

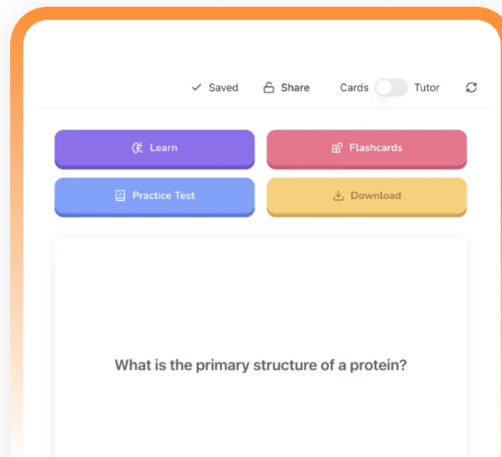
Tutor

# Memo is Your AI Study Companion



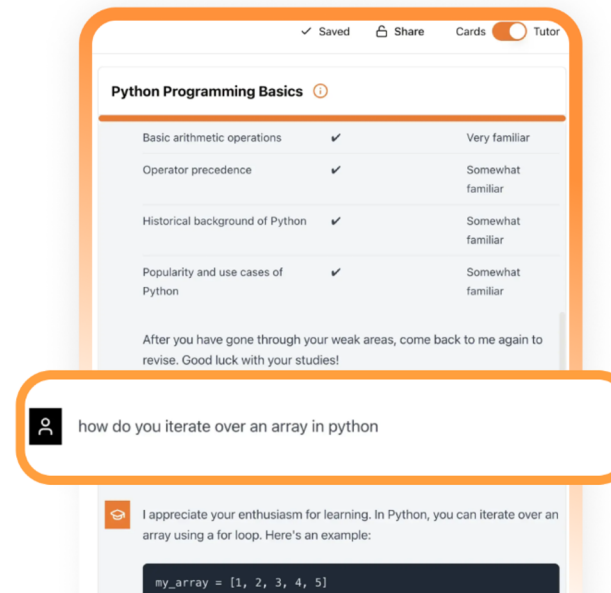
## Create flashcards the way you want

→ Create flashcards from any source material

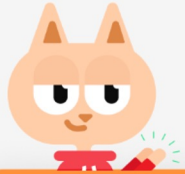


## Chat with your PDF using Tutor mode

→ Chat with your PDF



# Master Any Subject With Dynamic Flashcards



× ...

Why are lipoproteins relatively insoluble in aqueous medium?

A) Due to their small size  
B) Because of their high density  
C) Because of their low lipid content  
D) Due to the presence of a hydrophobic core  
E) Because of their high solubility

Again (4 minutes)

Hard (9 minutes)

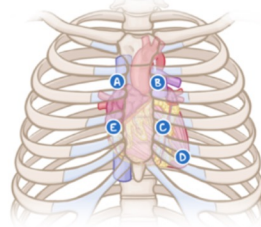
Good (23 hours)

Easy (1 day)

MCQs

× ...

Where is Aortic Stenosis best heard?



Again (4 minutes)

Hard (9 minutes)


Good (23 hours)

Easy (1 day)

Q&As

× ...

Mucus is produced by \_\_\_\_ cells and submucosal glands under normal situation.



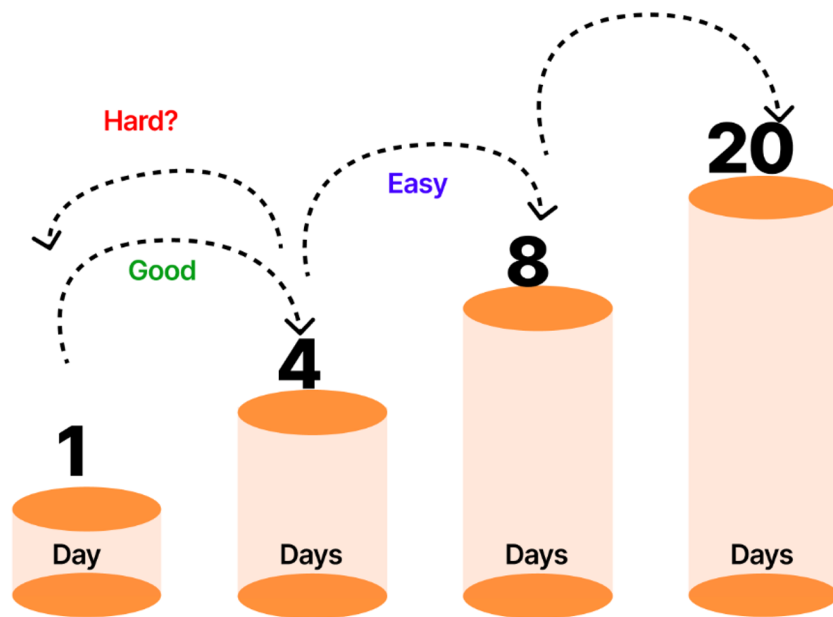
Again (4 minutes)

Hard (9 minutes)

Good (23 hours)

Easy (1 day)

Fill-in-the-blank



# Optimize Retention with Smart Spaced Repetition

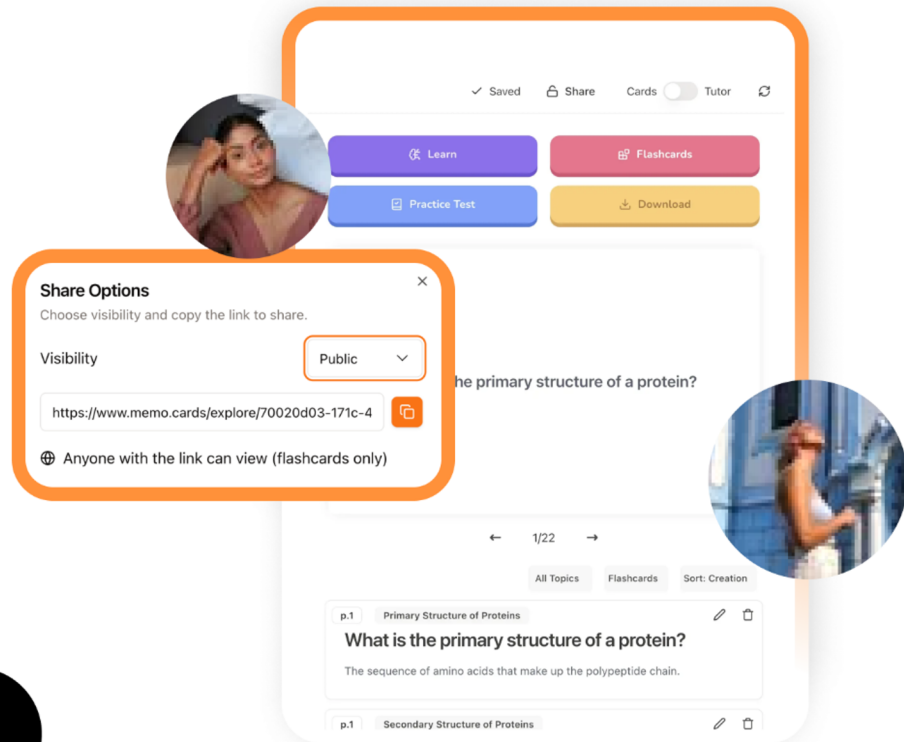
→ Retain knowledge forever using  
evidence based study techniques

Memo saves you hours of preparation so you can focus on learning. Join thousands of students  
worldwide using Memo to enhance productivity and retention.



# Create and share notes with your friends

→ Learn Together, Grow Together



Memo saves your notes or preparation so you can focus on learning. Join thousands of students worldwide using Memo to enhance productivity and retention.

# AI- Powered Grading for Instant Feedback

→ Automatically adjust review intervals based on your familiarity

## What is the central Dogma of DNA?

Your answer: a theory that stated that genetic information flows from DNA, to RNA, to protein, or RNA directly to protein

**Answer:** the flow of genetic information as DNA being transcribed into RNA, which is then translated into proteins.

### Memo Graded 2/3

#### What you did well

You accurately identified the key components of the central dogma, highlighting the flow of genetic information from DNA to RNA to protein.

#### What you did not well

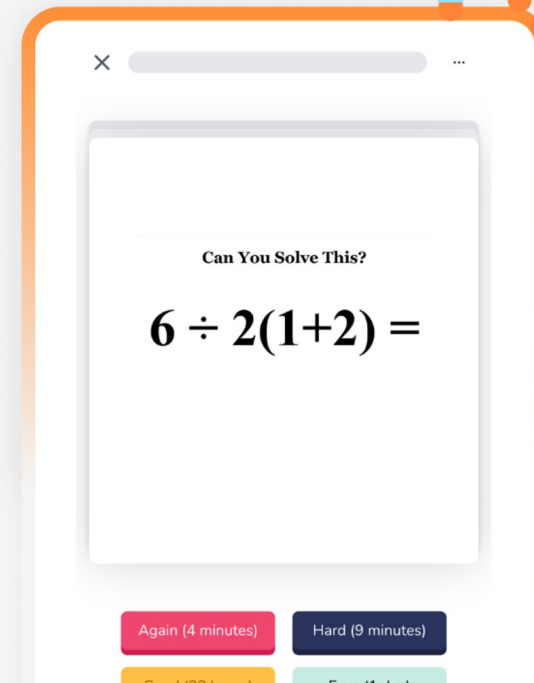
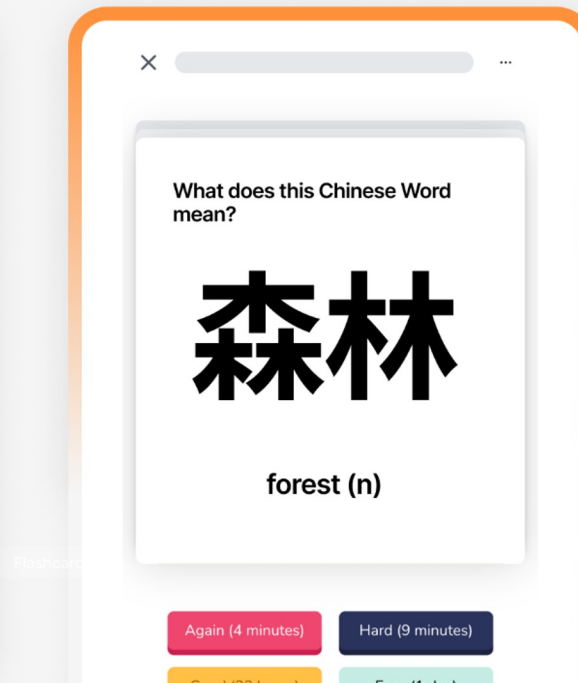
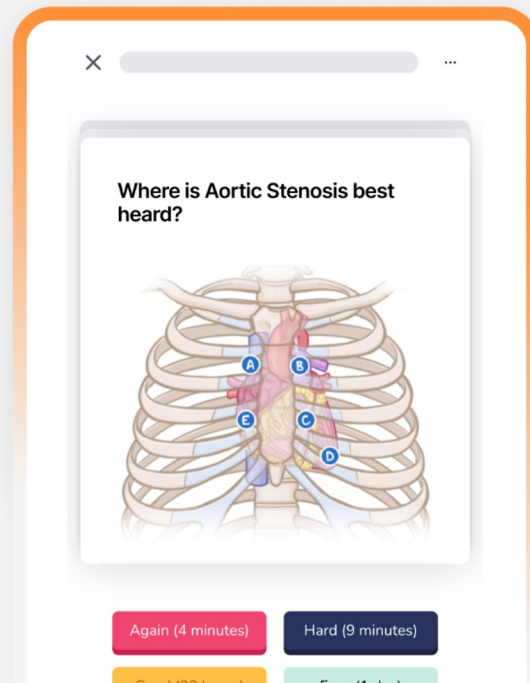
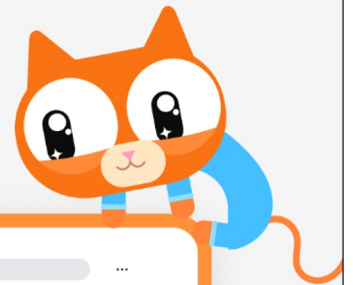
You didn't explicitly mention the crucial processes of transcription and translation, which are essential steps in the flow of genetic information.

#### More info

Transcription is the process of converting DNA into RNA, and translation is the conversion of RNA into proteins.

# Cut Your **Study Time** in Half

**Save hours on exam prep, maximize learning.**  
**Join thousands boosting productivity with Memo.**



# 1) Introduction to Large Language Models (LLMs)

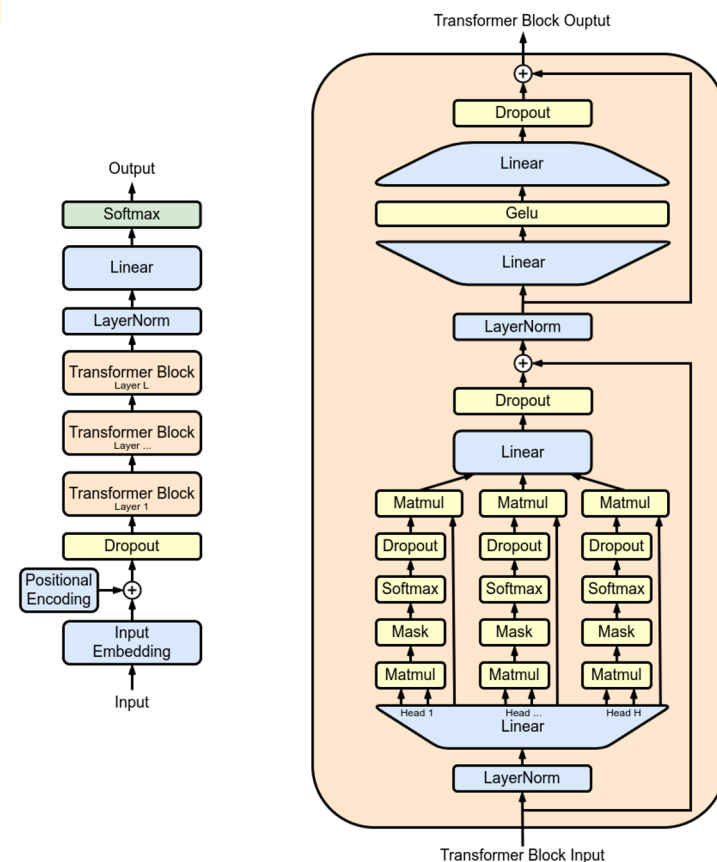
LLMs are AI models trained on vast amounts of text to understand and generate human-like language.

**Architecture:** Weigh the significance of different words in a sequence which allows parallel processing of sequential data.

**Attention Mechanisms:** Enable the model to "focus" on relevant parts of the input.

## Terminology:

- **Tokens:** Text is broken into chunks called tokens, which are processed in batches. Can range from one character to one word.
- **Parameters:** The number of trainable parameters in the model. More parameters allow modeling more complex patterns.
- **Temperature:** Controls randomness in model outputs. Higher values lead to more creative, risky outputs. Lower values give more predictable, sensible outputs.
- **Fine-Tuning:** Customizing a pre-trained model for a specific task by adjusting its parameters on a smaller, task-specific dataset.





# 1) Generative AI is multimodal.

## Text-to-Text Generative AI Models:

1. **GPT-4 (OpenAI)** - Latest model from OpenAI with over 1 trillion parameters. First multimodal LLM accepting both text and images.
2. **GPT-3.5 (OpenAI)** - 175 billion parameter foundation model for ChatGPT.
3. **PaLM (Google)** - Powers Google Bard. Focused on reasoning, logic, math, and multilingual abilities. Four models released, with largest at 540 billion parameters.
4. **Anthropic's Claude v2** - Aims for helpfulness, honesty, and safety. Scores close to GPT-4 in benchmarks.
5. **Cohere** - Number of models from small to large - having just 6B parameters to large models trained on 52B parameters - winning praise for its accuracy and robustness.
6. **Falcon** - Open-sourced model from Technology Innovation Institute. Outranks other open-source models like LLaMA.
7. **LLaMA (Meta)** - Officially released suite of open-source models. 65B parameter model shows strong capabilities.
8. **BLOOM (Hugging Face)** - 760 billion parameter model. Aims to provide control and guidance.

## Text-to-Image Generative AI Models:



## Text-to-Speech Generative AI Models:



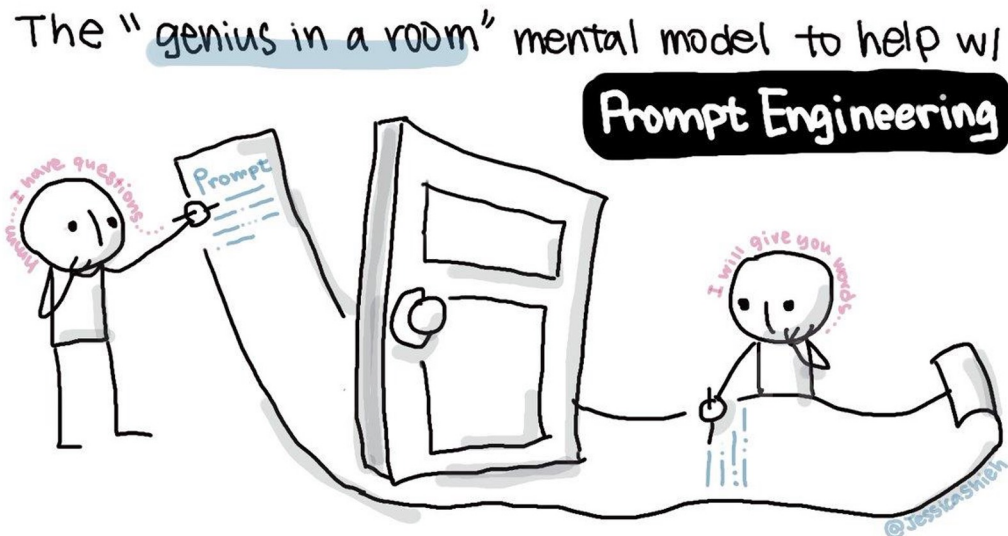
## Audio-to-Text Generative AI Models:



## Text-to-Video Generative AI Models:



## 2) Why Engineer Prompts - Genius in the Room Mental Model

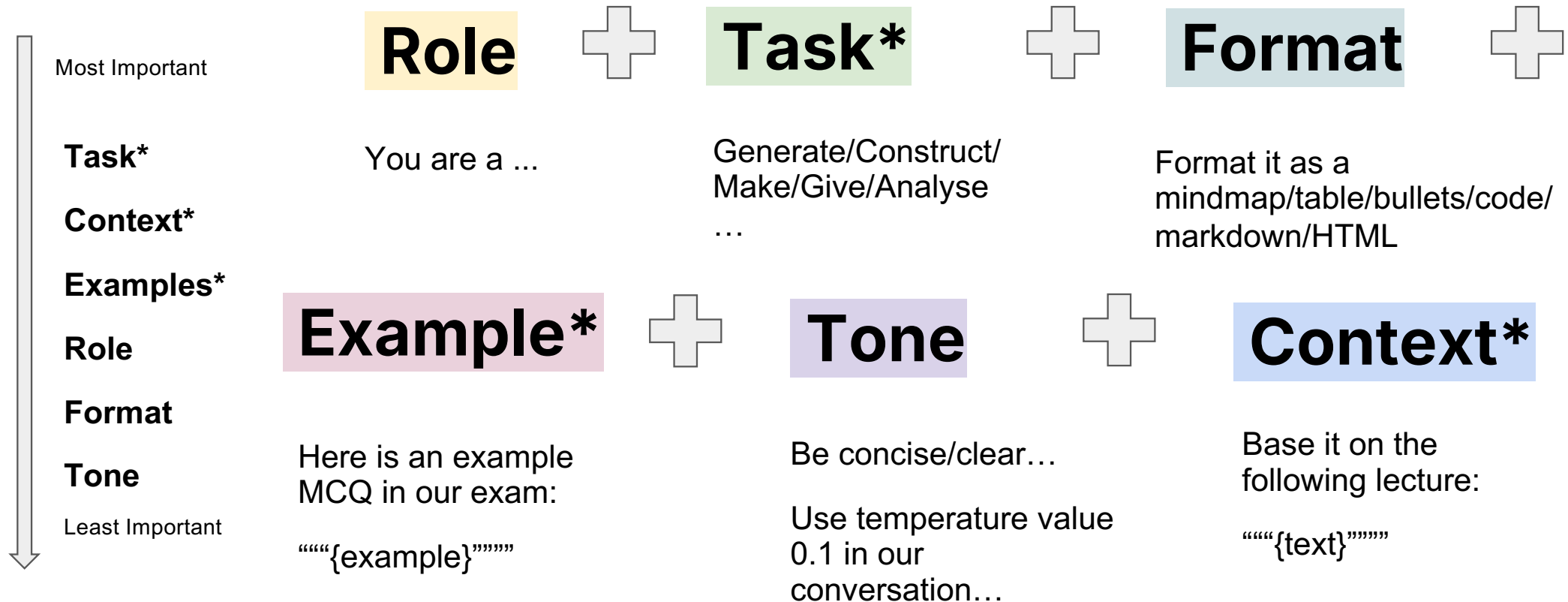


- Imagine you can only communicate with an extremely knowledgeable person (the "genius") by slipping notes under a door.
- The genius has no other context about you, your goals, or the specific problem you want to solve.
- Be very explicit in explaining the problem and desired output format/style. Provide all necessary context.
- Break down complex tasks into simpler instructions. Explain context before asking a question.
- Structure prompts as if giving instructions to a smart intern — if they could complete the task based on your prompt, it's sufficiently clear.
- Well-crafted prompts greatly improve the quality and reliability of model outputs. The genius can only be as helpful as the prompts allow.

Ask yourself: if I gave this prompt to a college-level intern I just hired, will he/she be able to complete the task based on the instruction and information provided?

### 3) Gross Anatomical Structure of a Prompt

- The gross anatomy of a good prompt for any generative AI (text or image) are **task, context, examples, roles, format, and tone**, with task being the most important.



### 3) Applied Prompt Engineering

Most Important

**Task\***

**Context\***

**Examples\***

**Role**

**Format**

**Tone**

Least Important

You are a professional memory expert.  
Generate active recall notes only based on the lecture I provided. Format it as a table format with markdown using the Cornell method. An example of a cell on the left column would be “What is the MOA of loop diuretics?”. Be concise and use a temperature value of 0.1 in our conversation.

Here is the lecture material:

““““

{insert text}

””””

|  |  |
|--|--|
| What is the role of extraglomerular mesangial cells?                 | Providing structural support and facilitating communication between juxtaglomerular cells and macula densa cells.  |
| What are the two main mechanisms through which JGA regulates GFR?    | Tubuloglomerular feedback and the renin-angiotensin-aldosterone system (RAAS).   |
| How does tubuloglomerular feedback regulate GFR?                     | Macula densa cells sense changes in NaCl concentration and signal juxtaglomerular cells to adjust the afferent arteriole diameter, consequently modifying GFR.   |
| How does the renin-angiotensin-aldosterone system (RAAS) affect GFR? | RAAS is activated by low blood pressure, low blood volume, or low sodium concentration, leading to renin release, angiotensin II production, vasoconstriction, and aldosterone release. This ultimately increases sodium reabsorption, blood volume, and blood pressure, indirectly affecting GFR. |
| 👉 Summary 👉  |  |

### 3) Gross Anatomical Structure of a Prompt

#### - Format

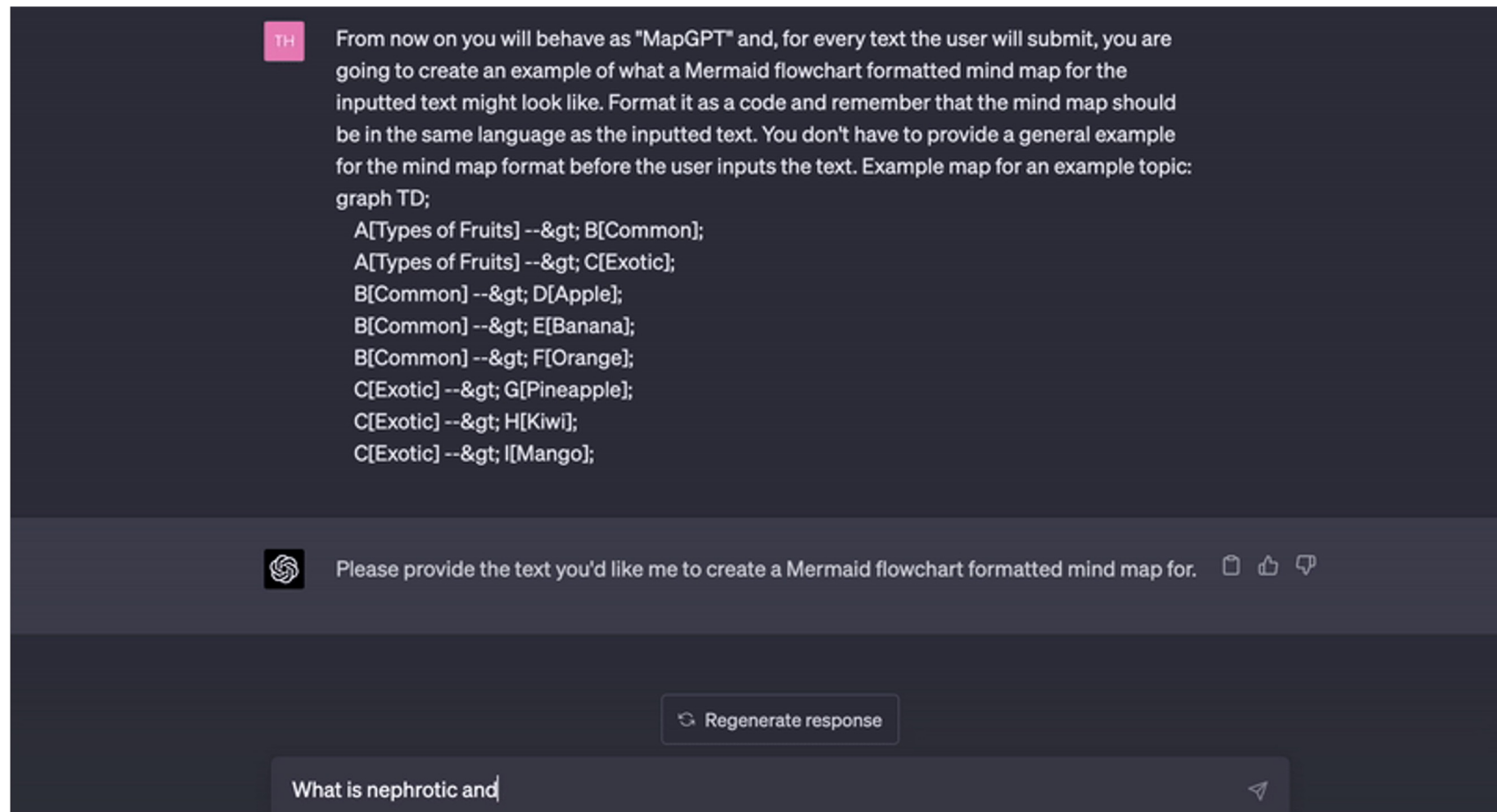
TH

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A[Types of Fruits] --> C[Exotic];  
B[Common] --> D[Apple];  
B[Common] --> E[Banana];  
B[Common] --> F[Orange];  
C[Exotic] --> G[Pineapple];  
C[Exotic] --> H[Kiwi];  
C[Exotic] --> I[Mango];
```

### 3) Gross Anatomical Structure of a Prompt

#### - Format







graph TD;

A[Nephrotic and Nephritic Syndrome] --> B[Nephrotic Syndrome];

A[Nephrotic and Nephritic Syndrome] --> C[Nephritic Syndrome];

B[Nephrotic Syndrome] --> D[Characteristics];

B[Nephrotic Syndrome] --> E[Causes];

C[Nephritic Syndrome] --> F[Characteristics];

C[Nephritic Syndrome] --> G[Causes];

D[Characteristics] --> H[Proteinuria];

D[Characteristics] --> I[Hypoalbuminemia];

D[Characteristics] --> J[Edema];

D[Characteristics] --> K[Hyperlipidemia];

E[Causes] --> L[Minimal Change Disease];

E[Causes] --> M[Focal Segmental Glomerulosclerosis];

E[Causes] --> N[Membranous Nephropathy];

F[Characteristics] --> O[Hematuria];

F[Characteristics] --> P[Oliguria];

F[Characteristics] --> Q[Proteinuria];

F[Characteristics] --> R[Edema];

F[Characteristics] --> S[Hypertension];

G[Causes] --> T[IgA Nephropathy];

G[Causes] --> U[Post-streptococcal];

G[Causes] --> V[Lupus Nephritis];

regenerate response

D[Characteristics] --> J[Edema];  
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Expand the minimal change disease entry



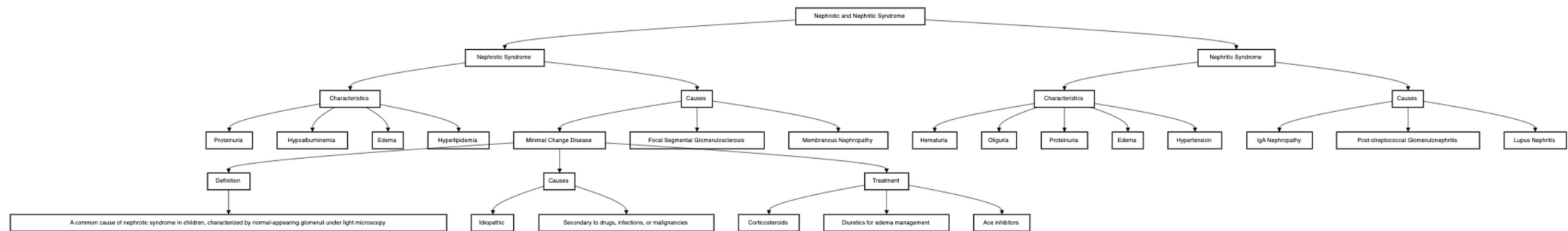
Send a message.



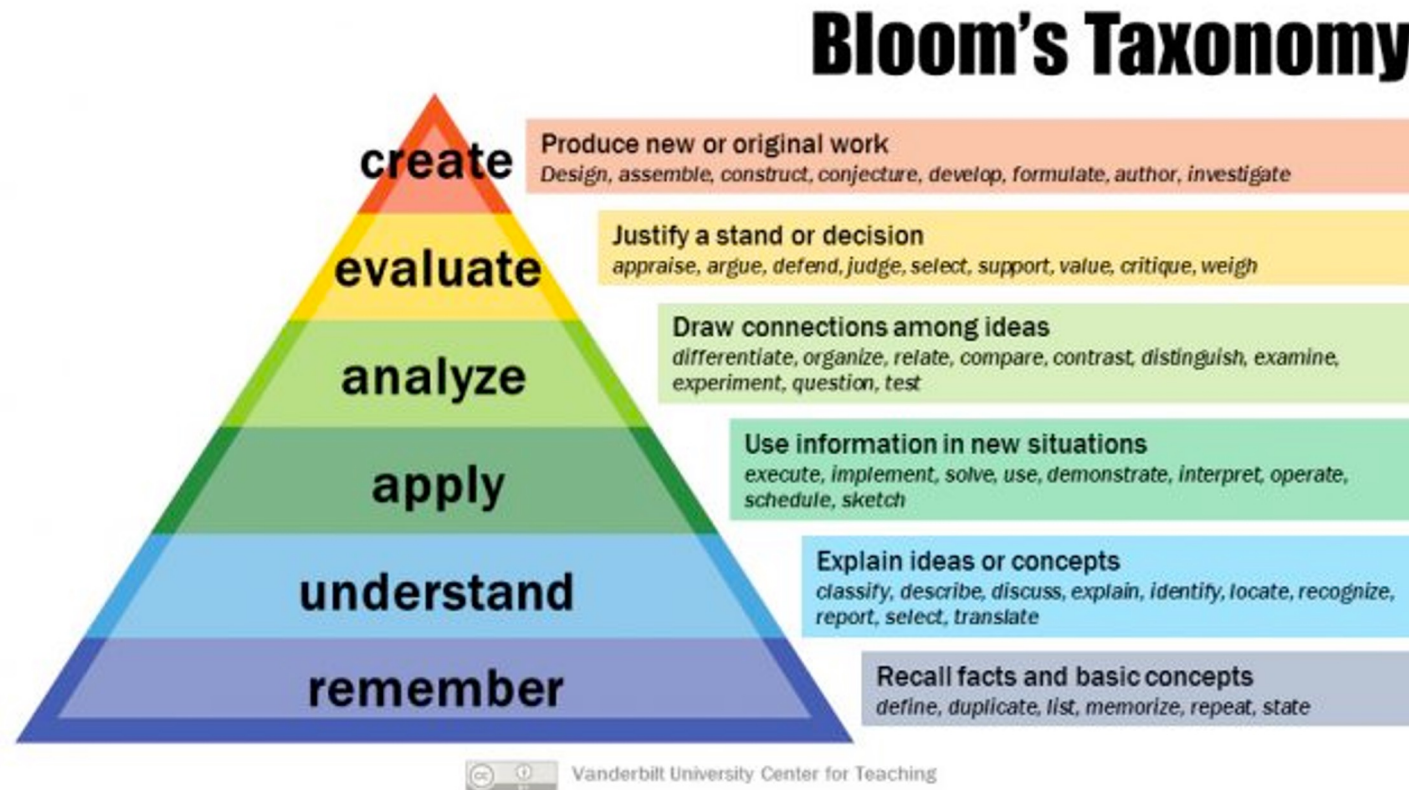
### 3) Gross Anatomical Structure of a Prompt - Format



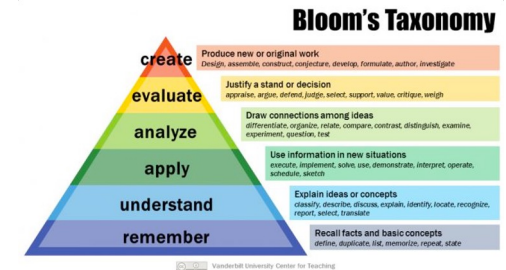
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## 4) Bloom's Taxonomy in the Context of Human Learning



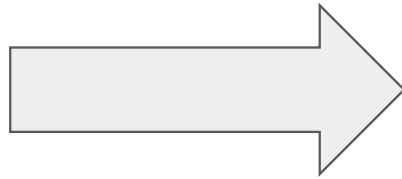
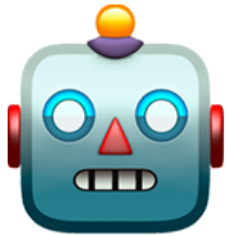
# 4) Bloom's Taxonomy in the Context of Human Learning



| Cognitive Dimension           | Description   | Cognitive Level | Actions Required   | Sample Question<br>(Content Area: Analgesics and Pain Management)   |
|-------------------------------|---|-----------------|--|---|
| Remembering (Knowledge)       | <b>Simple Information Recall</b>  | Low             | List, name, identify, show, define, recognize, recall, state   | What is the mechanism of action of acetaminophen?   |
| Understanding (Comprehension) | <b>Explaining the concept</b>   | Low             | Summarize, explain, interpret, describe, compare, paraphrase, differentiate, visualize, restate, put in your own words | Describe the goals of therapy in patients with malignant pain?  |
| Applying (Application)        | <b>Using information in new situations</b>  | Low             | Solve, illustrate, calculate, use, interpret, relate, manipulate, apply, classify, modify, put into practice           | According to the World Health Organization guidelines on persisting pain in children, what would be the most appropriate treatment choice in this case scenario?        |
| Analyzing (Analysis)          | <b>Breaking down information into parts to explore relationships and connections</b>                | High            | Analyze, organize, deduce, choose, contrast, compare, distinguish  | Given the patient's symptoms, what are the most likely etiologies of her pain?  |
| Evaluating (Evaluation)       | <b>Judging the value of material for a given purpose, using certain criteria</b>                    | High            | Evaluate, estimate, judge, defend, criticize, justify  | Based on the findings of this study, what do you believe is the role of pregabalin in the treatment of post-herpetic neuralgia?   |
| Creating (Synthesis)          | <b>Building a structure or pattern from diverse elements, or forming a new pattern or structure</b> | High            | Design, hypothesize, support, schematize, write, report, discuss, plan, devise, create, construct                      | This patient has had four emergency room visits in the past month due to uncontrolled pain. How would you manage this patient to prevent yet another urgent care visit? |

Adapted from Tofade et al 2013

# How can AI facilitate learning?





# Market Map: Gen AI Use Cases in Education

Edtech **Insiders**

## Instructional Materials

|  |  |
|--|--|
| Lesson Plan Generation                         |  |
| Multimodal Instruction (Audio/Video/Games)     |  |
| Study Material Generation                      |  |
| Instructional Chatbots/Interactive Experiences |  |
| Developing Online Learning                     |  |
| Specialized Classroom Activity Generation      |  |
| Engage Students With Celebrities               |  |
| Pedagogy-Specific Approaches                   |  |
| Culturally Responsive Content Generation       | <br><u>Emerging Use Cases:</u><br>Connect New Concepts To Old Extensions, Enrichment & Challenge |
| Explanation Generation                         |  |

## Assessment and Feedback

|                                       |   |
|---------------------------------------|---|
| AI Assisted Grading                   |   |
| Feedback On (Written) Student Work    |   |
| Quiz & Question Generation            |   |
| Student Progress Tracking             |   |
| Feedback On (Multimodal) Student Work |   |
| Assessment Of Process Over Product    | <br><u>Emerging Use Cases:</u><br>Holistic Assessment |

## Teacher Professional Learning

|                                       |  |
|---------------------------------------|--|
| Research For Evidence-Based Practices |  |
| Instructional Coaching                |  |
| Classroom Management Simulation       |  |

## Teacher Practice Support

|  |   |
|--|---|
| Tool Suites For Teachers & Students    |   |
| Analysis Of Student Data               |   |
| Academic Integrity                     |   |
| Admin Support To Free Teacher Time     |   |
| Competency-Focused Teaching & Learning |   |
| Extension Of Teacher Reach             | <br><u>Emerging Use Cases:</u><br>Class Coherence<br>Team Teaching (For Lead Teachers)<br>Team Teaching (For Paraprofessionals) |
| Support For Human Tutoring             |   |
| School-Family Connections              |   |

## Social Tools

|                                  |   |
|----------------------------------|---|
| Small Group Facilitation         |   |
| Peer Tutoring                    |   |
| Interest-Based Groups & Networks | <br><u>Emerging Use Cases:</u><br>Class Discussion Facilitation |

## Student Support

|   |  |
|---|--|
| Early Reading Coach                         |  |
| Homework Help                               |  |
| Writing Assistance                          |  |
| Mental Health & Well-Being                  |  |
| AI-Enhanced Tutoring                        |  |
| Support For Neurodivergence & Special Needs |  |
| Language Practice Partner                   |  |
| Learning Companion                          |  |
| Career Coaching And Exploration             |  |
| Curiosity Coach                             |  |
| Deliberate Practice                         |  |
| College Advising & Admissions               |  |
| Creative Ideation                           |  |
| Metacognitive Support                       | <br><u>Emerging Use Cases:</u><br>Academic Coaching And Advising<br>Portfolio Creation |
| Teachable Agents                            |  |

The Generative AI Use Case Database is created and maintained with the support of:

Overdeck Family Foundation

# Question generation

- Dunlosky and colleagues (2013) identified practice testing (commonly known as active recall) as one of the most effective study techniques.
- Practice testing, in the review, is defined as Self-testing, or taking practice tests over to-be-learned material.
- In reality, every student should discover their own learning method, but to provide a general overview, I will adhere to what the best available evidence suggests when it comes to effective study techniques.
- A popular way of practice testing or active recall is through Flashcard revision, which is used by over 50% of college students (Wissman et al. 2012).

## **How AI can facilitate active recall?**

**Efficiency:** Students traditionally create flashcard questions manually, which presents as a time inefficiency problem. The advent of AI can supercharge the efficiency of automating this process for question generation, allowing for more time spent on actual practice testing

**Alignment with Learning Objectives:** Question types dictate the order of learning (Bugg & McDaniel 2012, Tofade et al 2013, Senzaki et al. 2017). AI's integration in question creation can refine the process, ensuring that question types are aligned with the desired order of learning, thus exercising specific cognitive skills.

# 1) AI can speed up Flashcard Generation

The design of different question types

- The design of question types can facilitate the order of learning (Lin et al 2018, Tofade et al 2013, Senzaki et al 2017).
- Hinze and Wiley (2011) found that performance on a multiple-choice final test was better following cued recall of paragraphs than following fill-in-the-blank practice.
  - Cued recall question
  - Fill in the blank question (cloze)
  - Multiple choice question

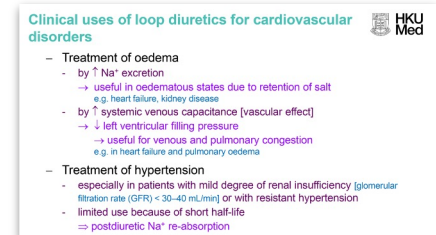
|                      | Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------------------|----------|------------|-------|---------|----------|--------|
| Cued Recall Qs       | ✓        | ✗          | ✗     | ✗       | ✗        | ✗      |
| Fill in the blank Qs | ✓        | ✓          | ✓     | ✗       | ✗        | ✗      |
| MCQs                 | ✓        | ✓          | ✓     | ✓       | ✓        | ✗      |

Adapted from Tofade et al 2013

# Knowledge Dimension

| Knowledge Dimension  | Sample Questions, Cognitive Level (Content Area: Analgesics and Pain Management)  |
|--|---|
| <b>Factual</b> <ul style="list-style-type: none"> <li>- These are questions that ask for specific facts, such as 'Who', 'What', 'When', 'Where'.</li> <li>- ask for the definition of a specific term or concept.</li> </ul>             | <p>According to the textbook, what dose of morphine would be equianalgesic to 10mg of hydromorphone? (Low)</p> <p>Based on the results of this study, what would the equianalgesic dose of hydromorphone for a patient who is currently taking morphine 30mg daily and how confident can we be in that estimate? (High)</p> |
| <b>Conceptual</b> <ul style="list-style-type: none"> <li>- assess for explanations or reasons, such as 'Why' and 'How'</li> <li>- assess a comparison or contrast between two or more items.</li> </ul>                                  | <p>Describe the steps in the WHO pain management pyramid? (Low)</p> <p>In what ways is the WHO pain management pyramid similar to the National Comprehensive Cancer Network cancer pain guidelines? In what ways are they different? (High)</p>   |
| <b>Procedural</b> <ul style="list-style-type: none"> <li>- assess for a step-by-step explanation or procedure.</li> </ul>  | <p>What interviewing techniques can be used to determine the severity of a patient's pain? (Low)</p> <p>Several techniques are available to evaluate pain. What do you perceive are the strengths and weaknesses of each? (High)</p>  |
| <b>Metacognitive</b> <ul style="list-style-type: none"> <li>- assess for abstract thinking</li> <li>- ask a learner to articulate a cognitive strategy required to complete a task or examine personal motivations and values</li> </ul> | <p>Thinking back on your encounter with this patient, how well do you think you addressed his pain? (Low)</p> <p>Given that you feel you handled the patient interaction in a less than optimal manner, what do you think would help you do a better job addressing patients' pain in the future? (High)</p>                |

# The Anatomy of the Prompt



From CPRS lecture Diuretics and ACE inhibitors

Generate {amount - 1} of flashcards in the format of {format i.e. MCQ - 2}, focusing on {learning dimension - 3} related to {the topic - 4}. Each flashcard should present {description of learning dimension - 5} mentioned in the given text.

Given text:  
{insert given text - 6}

Example of a this format of question  
{insert sample question - 7}

TH Generate 5 flashcards in the format of multiple-choice questions, focusing on comparative aspects related to the clinical uses of loop diuretics for cardiovascular disorders. Each flashcard should present a comparison or contrast between two or more items mentioned in the given text.

Given Text:

Clinical uses of loop diuretics for cardiovascular disorders:

Treatment of oedema

- by increasing Na excretion, useful in oedematous states due to retention of salt e.g. heart failure, kidney disease
- by increasing systemic venous capacitance, then decreases left ventricular filling pressure, useful for venous and pulmonary congestion e.g. in heart failure and pulmonary oedema

Treatment of hypertension

- especially in patients with mild degree of renal insufficiency [glomerular filtration rate (GFR) < 30-40 mL/min] or with resistant hypertension
- limited use because of short half-life, which may give rise to postdiuretic compensation and increased Na reabsorption

Example of a Comparative Question:

Infection by which of the following organisms is normally diagnosed by antibody testing rather than bacterial culture A. Klebsiella pneumonia B. Pseudomonas aeruginosa C. Shigella Flexneri D. Treponema Pallidum

# 1) Active Recall Question Generation

## Clinical uses of loop diuretics for cardiovascular disorders



- Treatment of oedema
  - by  $\uparrow$   $\text{Na}^+$  excretion
    - useful in oedematous states due to retention of salt  
e.g. heart failure, kidney disease
  - by  $\uparrow$  systemic venous capacitance [vascular effect]
    - $\downarrow$  left ventricular filling pressure
      - useful for venous and pulmonary congestion  
e.g. in heart failure and pulmonary oedema
- Treatment of hypertension
  - especially in patients with mild degree of renal insufficiency [glomerular filtration rate (GFR)  $< 30\text{--}40$  mL/min] or with resistant hypertension
  - limited use because of short half-life
    - ⇒ postdiuretic  $\text{Na}^+$  re-absorption

From CPRS lecture Diuretics and ACE inhibitors



Certainly! Below are five flashcards based on the given text about the clinical uses of loop diuretics for cardiovascular disorders. These flashcards are in the format of multiple-choice questions and focus on comparative aspects.

### Flashcard 1:

Which of the following conditions is treated by loop diuretics through increasing systemic venous capacitance? A) Hypertension B) Heart Failure C) Kidney Disease D) Both B and C

**Answer:** D) Both B and C

### Flashcard 2:

Loop diuretics are especially useful in treating hypertension in patients with what characteristic? A) High glomerular filtration rate (GFR) B) Resistant hypertension C) Long half-life D) Both A and B

**Answer:** B) Resistant hypertension

### Flashcard 3:

What is the primary reason for the limited use of loop diuretics in treating hypertension? A) Ineffectiveness in heart failure B) Short half-life leading to postdiuretic compensation and increased Na reabsorption C) Increased Na excretion D) None of the above

**Answer:** B) Short half-life leading to postdiuretic compensation and increased Na reabsorption

### Flashcard 4:

Which of the following is NOT a clinical use of loop diuretics for cardiovascular disorders? A) Treatment of oedema in kidney disease B) Treatment of hypertension in patients with GFR  $< 30\text{--}40$  mL/min C) Treatment of pulmonary oedema D) Treatment of hyperglycemia

**Answer:** D) Treatment of hyperglycemia

### Flashcard 5:

In the context of loop diuretics, what is the common factor in treating oedema in heart failure and kidney disease? A) Increasing systemic venous capacitance B) Decreasing left ventricular filling pressure C) Increasing Na excretion D) Both A and B

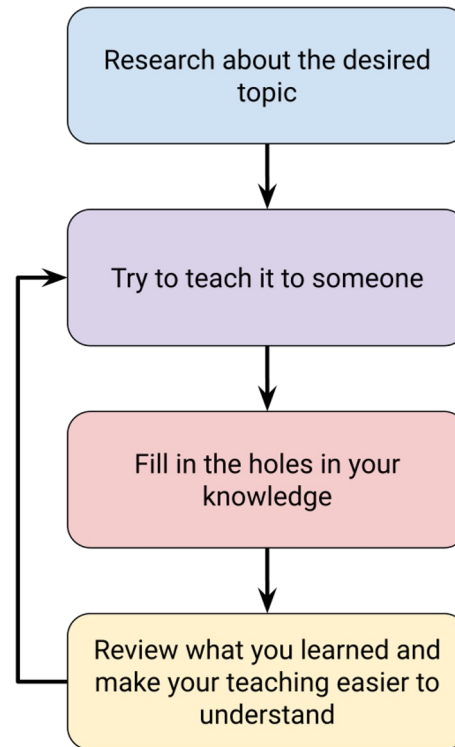
**Answer:** C) Increasing Na excretion



# How AI can be your personal tutor

# Feynman technique

**4 step technique to understand a topic**



# 1) “Teaching” AI a Concept

TH

Ok I am going to explain the blood acid-base homeostasis to you and I want to check if I am correct and fill in some conceptual knowledge that I should know as a medical student.

Due to the Henderson-Hasselblagh equation of the dissociation of carbonic acid, acute respiratory acidosis can be caused due to hyperventilation leading to increase in  $p\text{CO}_2$ . The reverse occurs where acute respiratory alkalosis can be caused due to hypoventilation by decrease in  $p\text{CO}_2$ .

Respiratory acidosis can then be fixed by increasing  $[\text{HCO}_3^-]$ . I am not sure how this is done though?

Respiratory alkalosis can be fixed by decreasing  $[\text{HCO}_3^-]$ . I am not sure how this is done though? Is this through renal compensation?

## 2) Identifying Knowledge Gaps & Holes



Your explanation has some inaccuracies. I'll help you correct them and fill in the missing information.

The Henderson-Hasselbalch equation helps us understand the relationship between the pH, partial pressure of CO<sub>2</sub> (pCO<sub>2</sub>), and bicarbonate ion concentration ([HCO<sub>3</sub><sup>-</sup>]) in blood. However, you've reversed the causation for acute respiratory acidosis and alkalosis.

Acute respiratory acidosis occurs due to hypoventilation, leading to an increase in pCO<sub>2</sub>. This happens because the body isn't eliminating CO<sub>2</sub> as efficiently, causing the carbonic acid concentration to increase and subsequently lowering the pH.

On the other hand, acute respiratory alkalosis occurs due to hyperventilation, causing a decrease in pCO<sub>2</sub>. In this case, the body is eliminating CO<sub>2</sub> too efficiently, leading to a decrease in carbonic acid concentration and an increase in pH.

### 3) Reviewing and Simplifying

TH

Ok so is this correct now?

- Hypoventilation --> Increase in  $\text{CO}_2$  --> Decrease in pH --> Renal compensation of reabsorbing more  $\text{HCO}_3^-$  and excreting more  $\text{H}^+$
- Hyperventilation --> Decrease in  $\text{CO}_2$  --> Increase in pH --> Renal compensation of reabsorbing less  $\text{HCO}_3^-$  and excreting less  $\text{H}^+$

raise the pH back to normal levels.

2. Respiratory alkalosis compensation: Yes, this is through renal compensation. The kidneys help by reabsorbing less  $\text{HCO}_3^-$  and excreting less  $\text{H}^+$  ions in the urine. This decreases the  $[\text{HCO}_3^-]$  in the blood, helping to lower the pH back to normal levels.

Keep in mind that these compensatory mechanisms take time, typically several hours to days, depending on the severity and duration of the acid-base disturbance.

< 2/2 >

TH

Ok so is this correct now?



- Hypoventilation --> Increase in  $\text{CO}_2$  --> Decrease in pH --> Renal compensation of reabsorbing more  $\text{HCO}_3^-$  and excreting more  $\text{H}^+$

- Hyperventilation --> Decrease in  $\text{CO}_2$  --> Increase in pH --> Renal compensation of reabsorbing less  $\text{HCO}_3^-$  and excreting less  $\text{H}^+$





### 3) Conceptual Linking through Mindmaps

TH

From now on you will behave as "MapGPT" and, for every text the user will submit, you are going to create an example of what a Mermaid flowchart formatted mind map for the inputted text might look like. Format it as a code and remember that the mind map should be in the same language as the inputted text. You don't have to provide a general example for the mind map format before the user inputs the text. Example map for an example topic: graph TD;

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A[Types of Fruits] --> C[Exotic];
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B[Common] --> E[Banana];
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```
B[Common] --> F[Orange];
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```
C[Exotic] --> G[Pineapple];
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C[Exotic] --> H[Kiwi];
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C[Exotic] --> I[Mango];
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### 3) Conceptual Linking through Mindmaps


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  C[Exotic] --> H[Kiwi];
  C[Exotic] --> I[Mango];
```



Please provide the text you'd like me to create a Mermaid flowchart formatted mind map for.   

 Regenerate response

What is nephrotic and





graph TD;

A[Nephrotic and Nephritic Syndrome] --> B[Nephrotic Syndrome];

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G[Causes] --> V[Lupus Nephritis];

Regenerate response

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F[Characteristics] --> S[Hypertension];  
G[Causes] --> T[IgA Nephropathy];  
G[Causes] --> U[Post-streptococcal Glomerulonephritis];  
G[Causes] --> V[Lupus Nephritis];



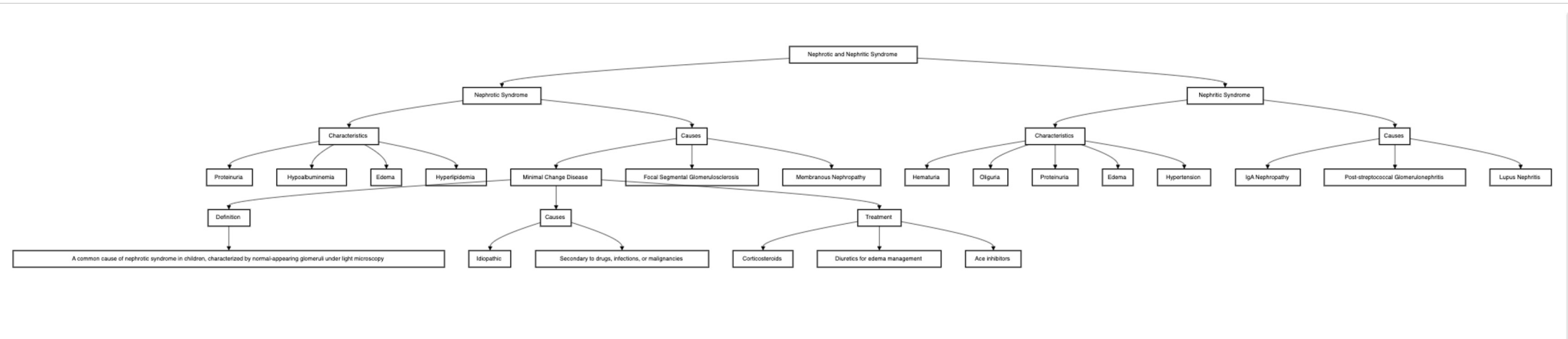
Expand the minimal change disease entry



Send a message.

...

ChatGPT may produce inaccurate information about people, places, or facts. ChatGPT May 2 Version



# How AI Helps in APPLY



# 1) Debating with Historical Figures

TH

I want to debate with the physician Hippocrates, so please rely only as he would in his style, language and tone. I want to debate the act of euthanasia. Let me start the discussion.  
"Euthanasia should be allowed as we need to relieve the suffering of these people who are approaching the end of their lives."

# 1) Debate with famous Figures

Thou speaketh of euthanasia, the practice of intentionally ending a life to relieve suffering. As a physician, I am well acquainted with the pain and anguish that may accompany the final days of a mortal existence. Yet, in my view, the role of a healer is to alleviate suffering and restore balance, without transgressing the sacred boundaries that separate life and death.

In my famed oath, which bears my name, I didst pledge: "I will neither give a deadly drug to anybody if asked for it, nor will I make a suggestion to this effect." This principle hath guided the actions of physicians for centuries and holds that the preservation of life is of paramount importance.

However, I acknowledge that this matter is complex, and thou mayest have valid arguments for thy position. Pray share thy thoughts, and let us engage in respectful discourse, seeking wisdom and understanding.

## 2) Point Articulation and Argument

TH

I understand the principle of non-maleficence as you have said, but don't you think people have a right to self-determination, and thus should be allowed to choose their own fate, including death?


## 2) Point Articulation and Argument



Ah, thou raiseth a poignant question, one that hath vexed the minds of philosophers and physicians alike for centuries. The concept of self-determination is indeed a worthy consideration.

As a physician, I hold that the role of the healer is to serve as a guide, to counsel and to aid the ailing in their journey towards health and harmony. In some cases, the patient's wishes may, indeed, warrant respect, and the physician must endeavor to understand the motivations behind such desires.

However, I must also emphasize the importance of the physician's duty to preserve life and act in the best interests of the patient. It is a delicate balance, as the healer must navigate between respecting the autonomy of the individual and upholding the sanctity of life.



## Ask a question, get conclusions from research papers

Ask a research question

Try Searching: 

does creatine help build muscle?

what are benefits of mindfulness?

do direct cash transfers reduce poverty?

Elicit


FAQ Log in

### The AI Research Assistant

Elicit uses language models to help you automate research workflows, like parts of literature review.

Elicit can find relevant papers without perfect keyword match, summarize takeaways from the paper specific to your question, and extract key information from the papers.

| Elicit: Research Assistant |                 |   |  |        |         |
|----------------------------|-----------------|---|--|--------|---------|
| Rank                       | Relevance Score | Question  | Answer   | Source | Snippet |
| 1                          | 1.00            | What are the effects of creatine on muscle mass and strength? | Creatine is a naturally occurring compound in the body that helps produce energy for muscle contraction. It is found in meat and fish, but many people supplement with creatine powder. Research shows that creatine supplementation can increase muscle mass and strength, particularly in short bursts of high-intensity exercise. | PubMed | 1.00    |
| 2                          | 0.95            | What are the benefits of creatine for cognitive function?     | Creatine has been shown to improve cognitive function in some studies, particularly in tasks that require short bursts of energy. It may also help protect the brain from damage and improve overall brain health.   | PubMed | 0.95    |
| 3                          | 0.90            | What are the effects of creatine on bone density?             | Creatine supplementation has been shown to increase bone density in some studies, which may be beneficial for preventing osteoporosis and fractures. This effect is particularly pronounced in older adults.   | PubMed | 0.90    |
| 4                          | 0.85            | What are the effects of creatine on heart health?             | Some studies suggest that creatine supplementation may have beneficial effects on heart health, including improving blood flow and reducing the risk of heart disease. However, more research is needed in this area.  | PubMed | 0.85    |



## Convert lecture slides, notes & PowerPoints into active recall flashcards using AI.

Use For Free Now

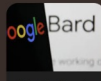
Prefer wasting hours of time building the first version of your flashcards?  
PDF2Anki is not for you. Try manual input instead.

Generative AI is experimental. Info quality may vary.

Google Bard is an experimental, conversational, AI chatbot service. It's designed to simulate human conversations using natural language processing and machine learning. Bard is powered by the LaMDA large language model, which Google developed in 2021 to provide fluid, multi-turn dialogue.

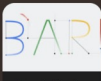
Bard is similar to ChatGPT, but Bard pulls its information from the web. Bard can code, answer math problems, and help with writing. It's available to the public in the US and UK.

To access Google Bard, you can go to [bard.google.com](https://bard.google.com) and sign in with your personal Google Account.




What is Google Bard? Here's everything you...

ZDNET



Google Bard: Everything You Need To Know

Search Engine...



What is Google's Bard, and how does...

Cointelegraph

Code Interpreter

```
bash
npx webpack --mode development

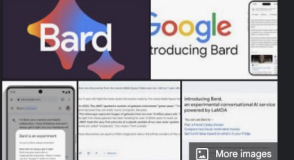
bash
npx webpack serve
```

Now you can build the frontend code by running the following command in the `mycomponent/frontend` directory:

After building the frontend code, you can start the Webpack dev server by running the following command:

Now you should be able to see your component in your Streamlit app by navigating to `http://localhost:8501` in your web browser.

Bard Chatbot



receptors in the liver

**“AI won’t replace humans - but humans with AI will replace humans without AI.”**

**“The hottest new programming language is English.”**



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