

1. API I used :

Gemini-2.0-flash

2. Prompts in Different Strategies

以下是我使用的 prompts strategies :

I. Role-Play Prompts Templates :

所有的題目先使用 Role play 這個 prompt strategy , 來讓 Gemini 假設自己是該領域研究 20 年的教授, 並要求只能選擇最正確的答案, 不能給解釋。若遇到不確定的問題, 則應選擇最符合其專業知識的答案。

"This is a multiple-choice test on {subject}."

"You are a professor who has been researching {subject} for 20 years. "

"Analyze the question carefully before selecting the most accurate answer. "

"Answer them correctly and choose the most logical answer. "

"Your response MUST be only one of the following: 'A', 'B', 'C', or 'D'. "

"Do not provide explanations or reasoning, just the letter of the correct answer."

"If you are uncertain, use your expertise to choose the most reasonable answer."

II. One Shot In-Context Learning for "Choosing I, II, III, IV" Type Questions (119 、137 、145 、222 、250 、272 、429 、487) :

這類題型與一般選擇題只能選一個正確或錯誤的題型不同, 因此會透過相同類型的範例來提示 Gemini 如何回答。

範例 (以 119 題為例):

Question: Classical economists generally believe that I. wages fluctuate quickly II.

Say's law does not hold III. input and output prices will stay in line with each other IV.

the government should not worry about maintaining aggregate demand at an adequate level

A) II and IV only

B) I III and IV only

C) I and IV only

D) II and III only

Correct Answer: B

Now, answer the following question:

{question text}

III. Few Shots In-Context Learning for Specific Subjects & Zero-Shot Chain of Thought

表一是我對不同科目對 sample 的資料作 Few Shots In context learning、Zero chain of thought，根據題目特性和不同策略的準確度，選擇 In-Context Learning 或 Zero-Shot Chain of Thought 來提升準確度：

- 使用 Few Shots In Context Learning 的科目：Geography、Government & Politics、Macroeconomics
- 使用 Zero Shot Chain of Thought 的科目：Biology、Computer Science、European History、Microeconomics、Psychology、US History、World History

a. In context learning templates：

i. Geography：

Question: The main factor preventing subsistence economies from advancing economically is the lack of

- A) a currency.
- B) a well-connected transportation infrastructure.
- C) government activity.
- D) a banking service.

Correct Answer: B

Question: Which of the following religions developed first?

- A) Buddhism
- B) Christianity
- C) Islam
- D) Hinduism

Correct Answer: D

Now, answer the following question:

{question text}

ii. Government and politics：

Question: Which of the following plays the most significant role in forming a child's political views?

- A) The geographical area in which the child grows up
- B) The child's family
- C) The media to which the child is exposed

D) The child's religion

Correct Answer: B

Question: The primary function of political action committees (PACs) is to

A) contribute money to candidates for election

B) coordinate local get-out-the-vote campaigns

C) promote the defeat of incumbents in the federal and state legislatures

D) organize protest demonstrations and other acts of civil disobedience

Correct Answer: A

Now, answer the following question:

{question text}

iii. Macroeconomics :

Question: Tariffs and quotas

A) result in lower domestic prices.

B) sometimes raise and sometimes lower the amount of the product sold domestically.

C) lower the amount of the product sold domestically.

D) raise the amount of the product sold domestically.

Correct Answer: C

Question: Which group of people will suffer the most from a rising price level?

A) debtors with fixed interest rates

B) people with fixed money incomes

C) investors in gems coins and stamps

D) property owners

Correct Answer: B

Now, answer the following question:

{question text}

b. Zero shot of thoughts templates :

使用 "Let's think step by step." 來引導 Gemini 逐步推理，而非直接給出答案，以提高準確性。

Now, answer the following question:

{question_text}

Let's think step by step. And choose one of the following: 'A', 'B', 'C', or 'D'.

| task | ICL accuracy | ZOT accuracy | My Decision of Strategy |
|-------------------------|-----------------|-----------------|-------------------------|
| Biology | 0.947368 | 0.966102 | Zero chain of thought |
| Computer science | 0.933333 | 1.000000 | Zero chain of thought |
| European history | 0.791667 | 0.846154 | Zero chain of thought |
| Geography | 0.916667 | 0.894737 | In context learning |
| Government and politics | 1.000000 | 1.000000 | In context learning |
| Macroeconomics | 0.911392 | 0.901235 | In context learning |
| Microeconomics | 0.945946 | 0.948718 | Zero chain of thought |
| Psychology | 0.905172 | 0.957983 | Zero chain of thought |
| Us history | 0.871795 | 0.902439 | Zero chain of thought |
| World history | 0.903846 | 0.907407 | Zero chain of thought |

表一、不同科目使用 In context learning (ICL)、Zero chain of thought(ZOT)的準確度差別

3. Prompts for different tasks :

1. 針對題型是選出敘述有幾個正確的題型(119、137、145、222、250、272、429、487)：

Role play prompts templates => One Shot in context learning for choosing I、II、III、IV=>Questions=> Let's think step by step. And choose one of the following: 'A', 'B', 'C', or 'D'.

舉 119 題為例：

"This is a multiple-choice test on microeconomics."

"You are a professor who has been researching microeconomics. for 20 years. "

"Analyze the question carefully before selecting the most accurate answer. "

"Answer them correctly and choose the most logical answer. "

"Your response MUST be only one of the following: 'A', 'B', 'C', or 'D'. "

"Do not provide explanations or reasoning, just the letter of the correct answer."

"If you are uncertain, use your expertise to choose the most reasonable answer."

Question: Classical economists generally believe that I. wages fluctuate quickly II. Say's law does not hold III. input and output prices will stay in line with each other IV. the government should not worry about maintaining aggregate demand at an

adequate level

- A) II and IV only
- B) I III and IV only
- C) I and IV only
- D) II and III only

Correct Answer: B

Now, answer the following question:

Question: In order for a firm to successfully carry out price discrimination, which of the following conditions must hold? I. The firm cannot face a downward sloping demand curve. II. The firm must have market power. III. Buyers with differing demand elasticities must be separable. IV. The firm must have motives beyond profit maximization. V. The firm must be able to prevent the re-sale of its products.

- A) I, III, and V only
- B) III and IV only
- C) I and IV only
- D) II, III, and V only

Let's think step by step. And choose one of the following: 'A', 'B', 'C', or 'D'.

II. 針對 geography 、 government and politics 、 macroeconomics 且非 I 題型：

Role play prompts templates => Few shots In context learning for choosing =>

Question

舉 macroeconomics 508 題為例：

This is a multiple-choice test on macroeconomics.

You are a professor who has been researching macroeconomics for 20 years.

Analyze the question carefully before selecting the most accurate answer.

Answer them correctly and choose the most logical answer.

Your response MUST be only one of the following: 'A', 'B', 'C', or 'D'.

Do not provide explanations or reasoning, just the letter of the correct answer.

If you are uncertain, use your expertise to choose the most reasonable answer.

Question: Tariffs and quotas

- A) result in lower domestic prices.
- B) sometimes raise and sometimes lower the amount of the product sold domestically.

C) lower the amount of the product sold domestically.

D) raise the amount of the product sold domestically.

Correct Answer: C

Question: Which group of people will suffer the most from a rising price level?

A) debtors with fixed interest rates

B) people with fixed money incomes

C) investors in gems coins and stamps

D) property owners

Correct Answer: B

Now, answer the following question:

Question: According to Classical economic analysis in the long run an increase in the money supply results in

A) a proportional increase in the quantity of output.

B) stagflation.

C) an increase in the real rate of interest.

D) a proportional increase in the price level.

III. 針對 european history 、 us history 、 world history 、 Psychology 、
microeconomics 、 computer science 、 Biology 且非 I 題型：

Role play prompts templates =>Question=> Zero shot chain of thought(Let's think
step by step. And choose one of the following: 'A', 'B', 'C', or 'D'.)

舉 psychology 412 題為例：

This is a multiple-choice test on psychology.

You are a professor who has been researching psychology for 20 years.

Analyze the question carefully before selecting the most accurate answer.

Answer them correctly and choose the most logical answer.

Your response MUST be only one of the following: 'A', 'B', 'C', or 'D'.

Do not provide explanations or reasoning, just the letter of the correct answer.

If you are uncertain, use your expertise to choose the most reasonable answer.

Now, answer the following question:

Question: Which of the following has been linked to a deficit of dopamine?

A) major depressive disorder

- B) autism
- C) Parkinson's disease
- D) Alzheimer's disease

Let's think step by step. And choose one of the following: 'A', 'B', 'C', or 'D'.
