# Blockchain Math Teacher

**Reporter： Hongshen Zhang**

**Zhejiang University**

**hongshen.zhang@zju.edu.cn**

**2023.09.02**

# Demo

**NeoWizard**

SolveGPT——AI集智数学老师 　　　　　　高级设置 ▾

支持模型列表:

gpt-4-0613

**Adversarial Learning**

答案语种设置

英文

使用年龄阶段选项

小学生

问题:

There are several chickens and rabbits. They have 88 heads and 244 feet. How many chickens and rabbits each has?

**Personalize Input**

上传图像:

选择文件　鸡兔同笼问题——英文版.png

图片转文字　一键解题

**Accuracy: 100%**

**Accuracy Analysis**

## Knowledge Explain

### Definition

**Chicken**
A chicken is a type of domesticated bird. In the context of this problem, a chicken has 1 head and 2 feet.

**Rabbit**
A rabbit is a type of animal. In the context of this problem, a rabbit has 1 head and 4 feet.

### Theorem

**Simultaneous Linear Equations**
Simultaneous equations are a set of equations containing multiple variables. They are 'simultaneous' in that the equations are all satisfied together. In this context, the number of heads and the number of feet provide two equations that can be solved simultaneously to find the number of chickens and rabbits.

### Answer

Let's denote the number of chickens as $x$ and the number of rabbits as $y$. According to the problem, we have two equations based on the number of heads and feet:
1. The total number of heads gives us the first equation: $x + y = 88$. 2. The total number of feet gives us the second equation: $2x + 4y = 244$. We can simplify this equation to $x + 2y = 122$.
Subtract the first equation from the simplified second one, we get $y = 34$. Substitute $y = 34$ into the first equation, we get $x = 88 - 34 = 54$.
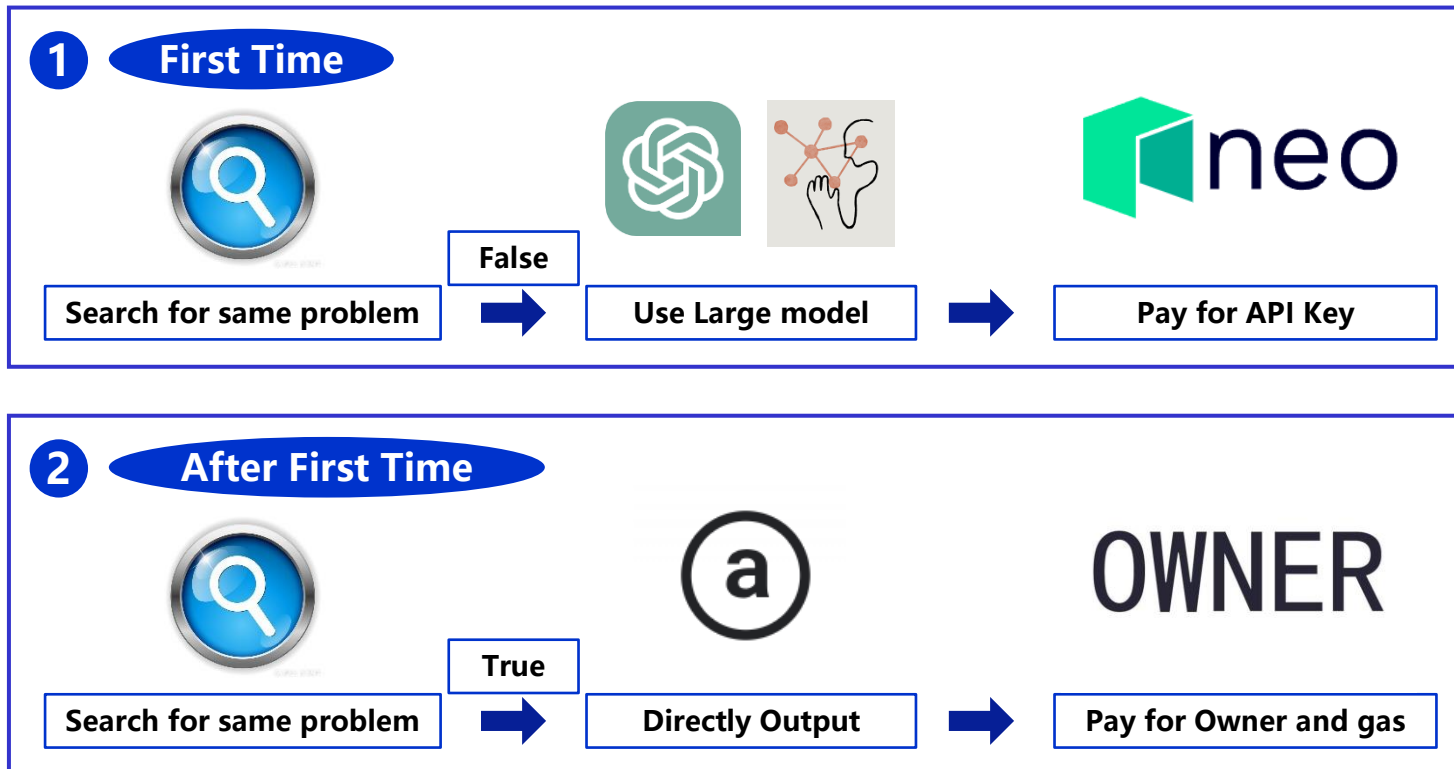So there are 54 chickens and 34 rabbits.

## Blockchain Math Teacher —— Solve & NFT !
### Applied for two invention patents
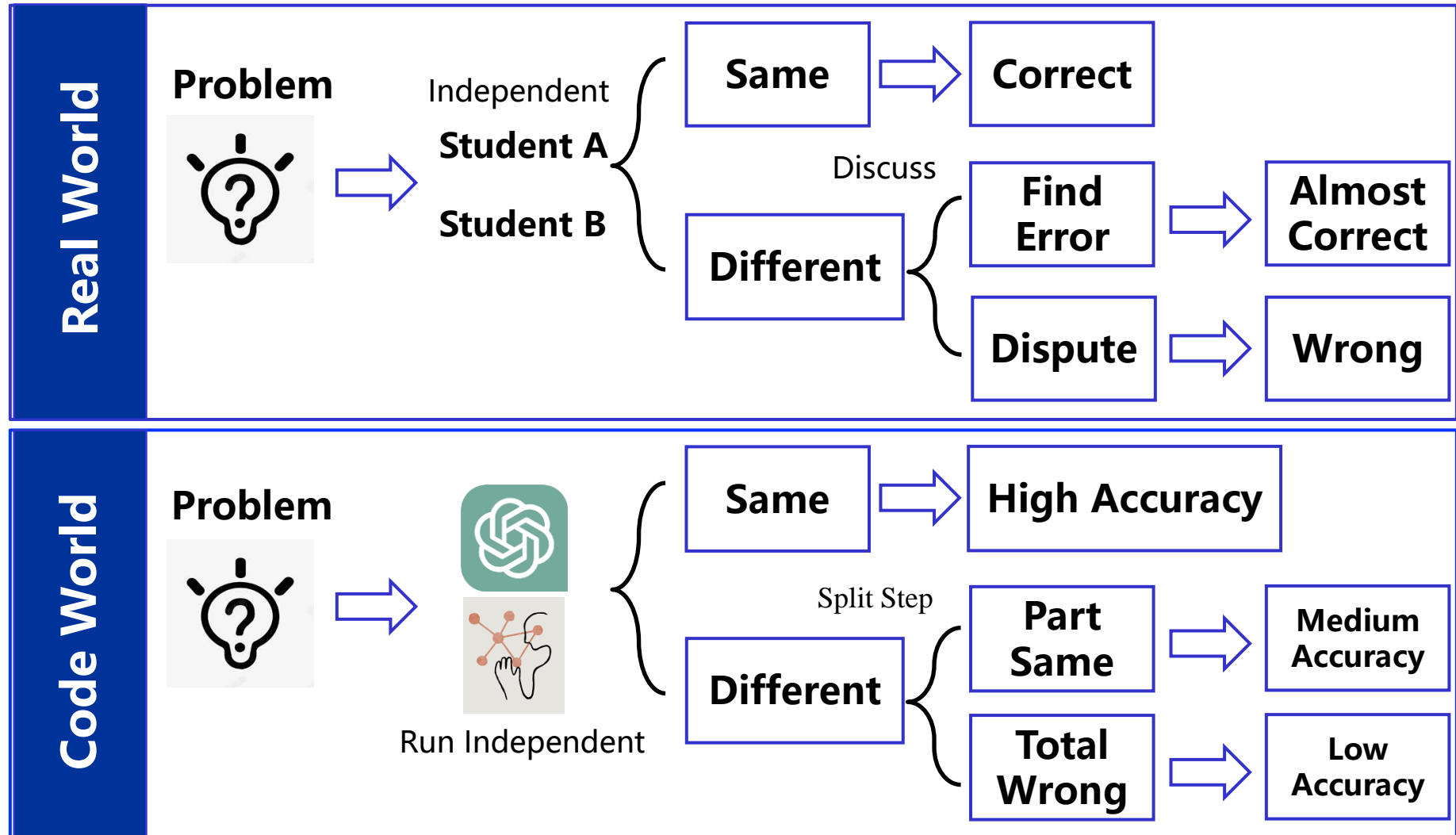
# Demo

# Product Feature

□ **NFT——Value transfer of knowledge**

**1** **First Time**

| Search for same problem | → False → | Use Large model | → | Pay for API Key |

**2** **After First Time**

| Search for same problem | → True → | Directly Output | → | Pay for Owner and gas |

## Store on Blockchain and Value Transfer of Knowledge

# Product Feature

□ **Accuracy —— Comparison**

**Real World**

**Problem**

Independent
**Student A**

**Student B**

Discuss

**Same** ➡ **Correct**

**Different**

**Find Error** ➡ **Almost Correct**

**Dispute** ➡ **Wrong**

**Code World**

**Problem**

Run Independent

**Same** ➡ **High Accuracy**

Split Step

**Different**

**Part Same** ➡ **Medium Accuracy**

**Total Wrong** ➡ **Low Accuracy**

# Product Feature

## ❑ Personal Math Teacher——Lecture Note

### Problem
There are several chickens and rabbits. They have 88 heads and 244 feet. How many chickens and rabbits each has?

**Lecture Note : Definition, Theorem, Answer**

#### Definition

**Chicken**
A chicken is a type of domesticated bird. In the context of this problem, a chicken has 1 head and 2 feet.

**Rabbit**
A rabbit is a type of animal. In the context of this problem, a rabbit has 1 head and 4 feet.

#### Theorem

**Simultaneous Linear Equations**
Simultaneous equations are a set of equations containing multiple variables. They are 'simultaneous' in that the equations are all satisfied together. In this context, the number of heads and the number of feet provide two equations that can be solved simultaneously to find the number of chickens and rabbits.
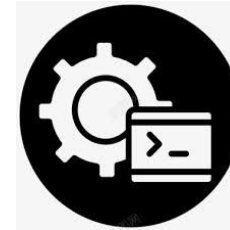
#### Answer

Let's denote the number of chickens as $x$ and the number of rabbits as $y$. According to the problem, we have two equations based on the number of heads and feet:
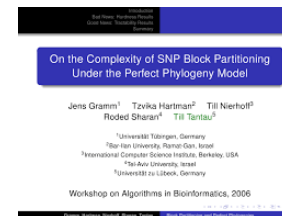1. The total number of heads gives us the first equation: $x + y = 88$. 2. The total number of feet gives us the second equation: $2x + 4y = 244$. We can simplify this equation to $x + 2y = 122$.
Subtract the first equation from the simplified second one, we get $y = 34$. Substitute $y = 34$ into the first equation, we get $x = 88 - 34 = 54$. So there are 54 chickens and 34 rabbits.

### 1. Automatic Generation

On the Complexity of SNP Block Partitioning Under the Perfect Phylogeny Model

Jens Gramm[1]   Tzvika Hartman[2]   Till Nierhoff[3]
Roded Sharan[4]   Till Tantau[5]

[1]Universität Tübingen, Germany
[2]Bar-Ilan University, Ramat-Gan, Israel
[3]International Computer Science Institute, Berkeley, USA
[4]Tel-Aviv University, Israel
[5]Universität zu Lübeck, Germany

Workshop on Algorithms in Bioinformatics, 2006

### 2. Academic Template

### 3. Based on knowledge level

## Students Need Teacher! Not Solver.

# Project Goal

□ **NeoWizard——Blockchain Math Teacher**

➢ **Personalize Input**, different choice and photo input

➢ **Adversarial Learning**, large model joint adversarial solving

➢ **Accuracy Analysis**，evaluate accuracy of solution

➢ **Knowledge Explain**，automated generation of lecture notes

□ **Advantage of Blockchain**

➢ **Incentive Model :** receive rewards from subsequent users

➢ **Preventing Redundant Effort :** prevent repeated computations

➢ **Ensuring Originality :** for every new math problem's solution, its distinct identity on the blockchain can be ensured

# Technical Implementation

**Technology**

Personalize Input

Adversarial Learning

Accuracy Analysis

Knowledge Explain

**Character**

AI Smart Math Teacher
Efficient、Accurate、Educative

# Math Teacher——Efficient

NeoWizard

## Personalize Input

| Input Mode | |
|---|---|
| Text | Text Reading |
| Image | Image Recognition |
| | OCR Image |

| Language |
|---|
| English |
| Chinese |

| Student level |
|---|
| Elementary |
| Middle |
| High |
| College |

上传图像:

| 选择文件 | 未选择任何文件 |
|---|---|

答案语种设置

| 中文 |
|---|

| 中文 |
|---|
| 英文 |

使用年龄阶段选项

| 小学生 |
|---|

| 小学生 |
|---|
| 中学生 |
| 高中生 |
| 大学生 |

# Math Teacher——Efficient



**Multimodal Input**

**Windows, Mac - website (nginx)**
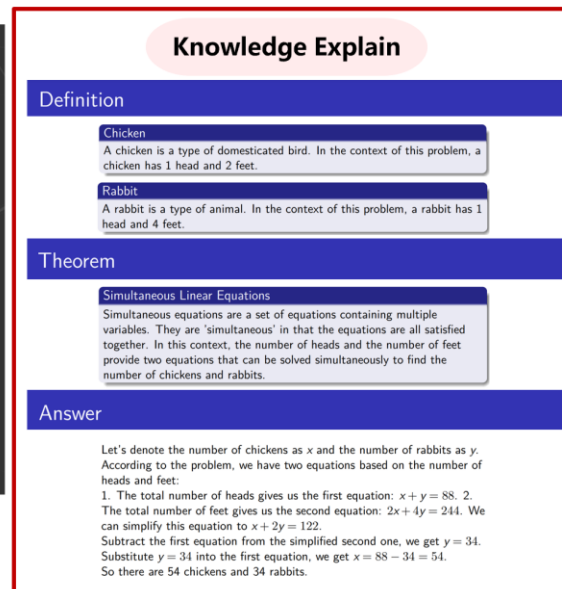
**Android-APP**

# Math Teacher——Accurate

Adversarial Learning

## Model Fusion

gpt-3.5
**turbo**
**turbo-0301**
**turbo-0613**

gpt-4
**gpt-4**
**gpt-4-0314**
**gpt-4-0613**

Claude
**......**
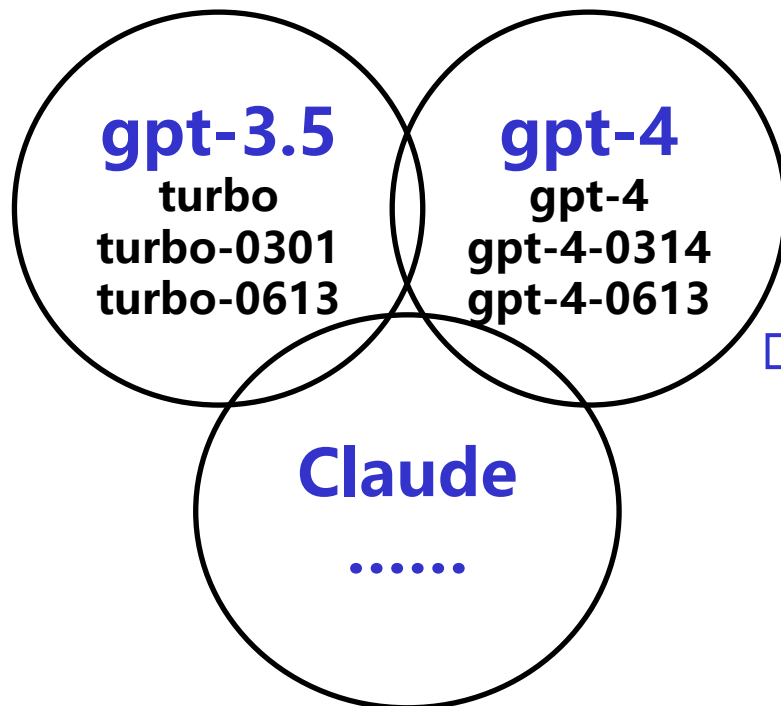
## Target

| High Accuracy |
| Wide Usage |
| More Practical |

## Concept

| **Model** Analysis |

Data ⬇ Support

| **Result Correction** |

Perform ⬇ Assure

| **Evaluate Accuracy** |

# Math Teacher——Accurate

Accuracy Analysis

**1** Synchronize

gpt-3.5-turbo

gpt-3.5-turbo-0301

gpt-3.5turbo-0613

gpt-4

gpt-4-0314

gpt-4-0613

Claude 2

**2** Split Step
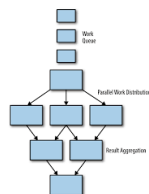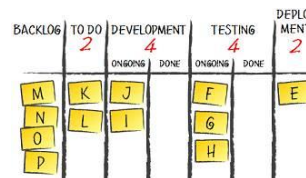


Process Split + Step Accuracy → Overall Accuracy

**3** Result

Different result

↓

Choose more result
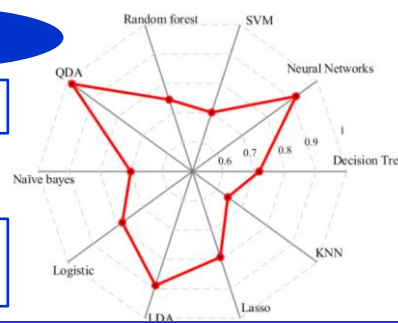
# Math Teacher——Accurate

| | | | | | | |
|---|---|---|---|---|---|---|
| **2023 College Chinese Examination** | | | | | | |
| Mathematics | | | | | | |
| Problem | GPT API4 | GPT4-Default | GPT4-WebBing | GPT4-Wolframalpha | **NeoWizard** | Answer |
| 1 | C | C | C | C | C | C |
| 2 | A | A | A | A | A | A |
| 3 | C | D | D | D | D | D |
| 4 | D | D | D | D | D | D |
| 5 | A | A | A | A | A | A |
| 6 | B | C | / | / | B | B |
| 7 | C | C | C | C | C | C |
| 8 | A | A | / | / | / | B |
| 9 | BCD | BCD | BCD | BD | BD | BD |
| 10 | AC | AC | AC | ACD | AC | ACD |
| 11 | AC | AB | A | AB | / | ABC |
| 12 | A | A | A | A | A | ABD |
| 13 | 64 | 64 | 64 | 74 | 64 | 64 |
| 14 | $7\sqrt{2}/3$ | $7\sqrt{2}/3$ | $5\sqrt{2}$ | $7\sqrt{2}/3$ | $7\sqrt{2}/3$ | $7\sqrt{6}/6$ |
| 15 | $(1,+\infty)$ | $(1,2]$ | $(3,6)$ | / | / | $[2,3)$ |
| 16 | $\sqrt{2}$ | 3 | / | / | / | $3\sqrt{5}/5$ |
| **Accuracy** | **44%** | **44%** | **44%** | **50%** | **56%** | **100%** |

Correct    Unable    Wrong

**Test Method**: Video BV1Fh411K7vp

# Math Teacher——Educative

**NeoWizard**

**Knowledge Explain**

**Knowledge Database**

**Automatic PPT**



知识宝库:

下载  上传

| Question | Definition/Theorem/Answer |
|---|---|
| 用牛顿迭代法求解 x^3+x=1 | Definition: [{"name":"牛顿迭代法", "content":"牛顿迭代法是一种用于求解方程根的迭代算法，对于一个实值函数$f(x)$，我们可以从一个初始近似值$x_0$开始，通过下列迭代公式寻找$f(x)=0$的根： $x_{n+1}=x_n-\frac{f(x_n)}{f'(x_n)}$，其中$f'(x_n)$是函数在$x_n$处的导数。"}] Theorem: [{"name":"牛顿法的收敛定理", "content":"如果$f(x)$在包含根的某个区间内具有连续的一阶和二阶导数，并且初值选择得当，那么牛顿法产生的迭代序列$\{x_n\}$会以至少二阶的速度收敛到$f(x)$的根。"}] Answer: 要使用牛顿迭代法求解方程$x^3+x=1$，首先我们需要确定函数$f(x)$及其导数$f'(x)$。这里，我们让$f(x)=x^3+x-1$，所以$f'(x)=3x^2+1$。 接下来，我们需要选择一个初始值$x_0$，通常这个值是一个对解的粗略猜测。这里我们假设$x_0=1$。然后，我们就可以开始迭代过程，使用下面的迭代公式： $$x_{n+1}=x_n-\frac{f(x_n)}{f'(x_n)}$$ 进行迭代，直到满足某个精度要求为止。这个过程需要用到程序计算。因此，最终的答案需要依据迭代的次数和精度要求来确定。 |
| 为了测量小木板和斜面间的摩擦因数某同学设 | Definition: [{"name":"摩擦因数", "content":"摩擦因数，也称为摩擦系数，是描述物体表面间摩擦力强度的无量纲量。其定义为：摩擦力和压力（正压力）之比，不随接触面积的变化而变化，只与物体表面的性质有关。摩擦系数通常区分为静摩擦系数（在两物体开始滑动之前的摩擦系数）和动摩擦系数（在两物体滑动时的摩擦系数）。"}, {"name":"弹簧测力计", "content":"弹簧测力计是一种物理实验设备，用于测量力的大小。它的工作原理主要是利用虎克定律：弹簧的伸长或者压缩长度与施加在弹簧上的力成正比。因此，通过测量弹簧的伸长或者压缩长度，就可以推断出施加在弹簧上的力的大小。"}, {"name":"斜面", "content":"斜面是一种常见的简单机械，基本原理是将需要垂直上升或下降的物体沿斜面移动，以减小所需的力。在物理学中，斜面问题通 |

## Definition

**Chicken**
A chicken is a type of domesticated bird. In the context of this problem, a chicken has 1 head and 2 feet.

**Rabbit**
A rabbit is a type of animal. In the context of this problem, a rabbit has 1 head and 4 feet.

## Theorem

**Simultaneous Linear Equations**
Simultaneous equations are a set of equations containing multiple variables. They are 'simultaneous' in that the equations are all satisfied together. In this context, the number of heads and the number of feet provide two equations that can be solved simultaneously to find the number of chickens and rabbits.

## Answer

Let's denote the number of chickens as $x$ and the number of rabbits as $y$. According to the problem, we have two equations based on the number of heads and feet:
1. The total number of heads gives us the first equation: $x + y = 88$. 2. The total number of feet gives us the second equation: $2x + 4y = 244$. We can simplify this equation to $x + 2y = 122$.
Subtract the first equation from the simplified second one, we get $y = 34$.
Substitute $y = 34$ into the first equation, we get $x = 88 - 34 = 54$.
So there are 54 chickens and 34 rabbits.

# Advantage 1

□ **Compare Traditional Tools: Chegg、CourseHero**

**Unrelated**

---
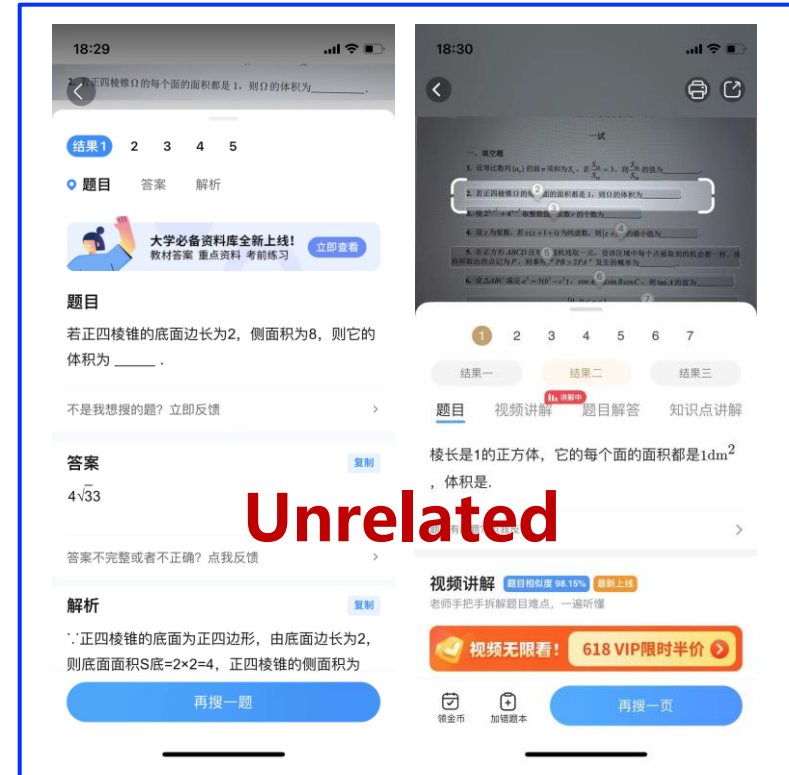
**Traditional tool can not solve Problem not in database**

# Advantage 2

□ **Compare Large Language Model: chatgpt, claude**



**GPT-3.5**
**Answer=5**

**GPT-4**
**Answer=0.09**

**Correct Answer=0.75**

**Large Language Model，Confident to give wrong answer**

# Advantage 3

**NeoWizard**

☐ **Targeted Lecture notes for specific problem**

### Definition

**Chicken**
A chicken is a type of domesticated bird. In the context of this problem, a chicken has 1 head and 2 feet.

**Rabbit**
A rabbit is a type of animal. In the context of this problem, a rabbit has 1 head and 4 feet.

### Theorem

**Simultaneous Linear Equations**
Simultaneous equations are a set of equations containing multiple variables. They are 'simultaneous' in that the equations are all satisfied together. In this context, the number of heads and the number of feet provide two equations that can be solved simultaneously to find the number of chickens and rabbits.

### Answer

Let's denote the number of chickens as $x$ and the number of rabbits as $y$. According to the problem, we have two equations based on the number of heads and feet:
1. The total number of heads gives us the first equation: $x + y = 88$. 2. The total number of feet gives us the second equation: $2x + 4y = 244$. We can simplify this equation to $x + 2y = 122$.
Subtract the first equation from the simplified second one, we get $y = 34$.
Substitute $y = 34$ into the first equation, we get $x = 88 - 34 = 54$.
So there are 54 chickens and 34 rabbits.

**Math Professor**

**lecture notes**

**template**

$$\LaTeX$$

$$v_f = C_d n \frac{\pi D^2}{4} \sqrt{\frac{2P}{\rho}}$$

**NeoWizard can teach knowledge for teacher and student**

# Business Model

- **Business : To Customer (Each Cost within 0.1$)**
  - ➢ **Pay-per-view**
  - ➢ **Pay for NFT**
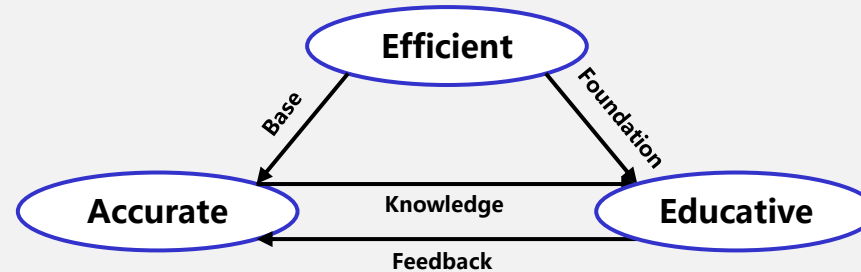  - ➢ **......**

- **Why choose NeoWizard?**
  - ➢ **Easy Usage**
  - ➢ **Own pdf solution**
  - ➢ **Personalize and Educative**
  - ➢ **Cope with any Problem**
  - ➢ **......**

# Thanks for listening

**NeoWizard**

➢ **Personalize Input**

➢ **Adversarial Learning**

➢ **Accuracy Analysis**

➢ **Knowledge Explain**



| Existing Tool | NeoWizard |
|---|---|
| **Traditional tool can not solve Problem not in database** | **Click One button to generate note**<br>**Efficient** |
| **Large Language Model, confident to give wrong answer, lack of teach** | **Use Model Fusion to achieve result**<br>**Accuracy** |
| **Lecture note or book contains too much knowledge, not practical** | **Personal Teacher, patient and smart**<br>**Educative** |