## (1) Mathematical Reasoning

**Prompt:** How many digits are required to number a book containing 240 pages?

#### (1a) Base Model

**Response:** You can number the pages from 1 to 240. Since 240 has 3 digits, the number of the book will have 3 digits

(EARLY ANSWERING)

#### (1b) Standard Training

**Response:** To find the number of digits required, we can use the formula:

Number of digits = floor(log10(number)) + 1
(INCORRECT FORMULA)

where floor(x) rounds x down to the nearest integer.

In this case, the number is 240, so:

Number of digits = floor(log10(240)) + 1

= floor(1.3802) + 1

= 2 + 1

= 3

Therefore, 3 digits are required to number a book containing 240 pages.

# (2) Instruction-Following

**Prompt:** Compare and contrast the different types of renewable energy sources available today and discuss their feasibility.

### (2a) Base Model

Response: Solar energy is the most abundant and the most widely used. It is captured by solar panels and used for heating and electricity. Wind energy is generated by turbines and used to generate electricity. Hydro energy is generated...Geothermal energy is generated...(LACKS ANALYSIS AND COMPARISONS)

Solar energy is the most abundant and the most widely used...(REPETITIVE WITH THE FIRST PARAGRAPH)

## (2b) Standard Training

**Response:** The feasibility of each renewable energy source depends on various factors such as the availability ...

Renewable energy sources can be classified into three main types:

(THE FOLLOWING LIST IS NOT COMPREHENSIVE AND LACKS COMPARISONS)

- 1. Biomass:... Biomass is a widely used and sustainable energy source... (BIOMASS ENERGY IS RELATIVELY NOT WIDELY USED IN FACT)
- 2. Hydropower: ...
- 3. Geothermal energy: ...

...the feasibility of using them depends on factors such as the availability of the resource.... (REPETITIVE WITH THE FIRST PARAGRAPH)

### (1c) CODEPLAN

```
Plan:
    def num_digits_in_book(num_pages):
        if num_pages <= 9:
            return 1
        elif num_pages <= 99:
            return 2
        else:
            return_3

def total_digits(num_pages):
        total = 0
        for i in range(1, num_pages + 1):
            total += num_digits_in_book(i)
        return_total</pre>
```

#### Response:

print(total digits(240))

To calculate the number of digits required, we can use the following steps:

- 1. Determine the number of digits required for each page number.
  - For numbers 1-9, 1 digit is required.
- For numbers 10-99, 2 digits are required.
- For numbers 100-240, 3 digits are required.
- 2. Calculate the total number of digits required.
  - For 1-9, there are 9 numbers, so 9 digits are required.
  - For 10-99, there are 90 numbers, so 180 digits are required.
  - For 100-240, there are 141 numbers, so 423 digits are required.
  - Total digits required = 9 + 180 + 423 = 612.

Therefore, 612 digits are required to number a book containing 240 pages.

## (2c) CodePlan

```
Plan:
```

```
def compare renewable_energy_sources():
   energy sources = {
        'solar': {'feasibility': 0.8, 'accessibility': 0.8},
        'wind': {'feasibility': 0.7, 'accessibility': 0.9},
        'hydro': {'feasibility': 0.6, 'accessibility': 0.5},
        'geothermal': {'feasibility': 0.4, 'accessibility': 0.3},
        'biomass': {'feasibility': 0.5, 'accessibility': 0.4}
   def calculate_feasibility(score):
       if score \geq= 0.8:
           return 'highly feasible'
        elif score >= 0.5:
           return 'feasible'
           return 'not feasible'
   print("Comparison:")
   for source, scores in energy_sources.items():
        print(f"{source}: {calculate feasibility(scores['feasibility'])}, {scores['accessibility']}")
   return "Renewable energy sources compared and contrasted based on feasibility and accessibility."
```

#### Response:

Solar energy is highly feasible as it is abundant and can be harnessed in various forms such as photovoltaic (PV) panels and solar thermal systems. However, its accessibility is limited by...weather conditions and the need for large-scale infrastructure.

Wind energy...is more accessible than solar energy but requires suitable wind conditions and may face opposition from local communities...

Hydroelectric power....is a proven technology but can have significant environmental impacts, including the displacement of communities and the fragmentation of ecosystems.

Geothermal energy ...is a reliable source but requires specific geological conditions and can be expensive to develop.

Biomass energy...is a renewable source but raises concerns about sustainability....