AI ASSISTED LAB EXAM

KAVALI SAI KARTHIK
2403A52043
BATCH – 03

QUESTION – 1

Q1. Zero- shot Prompting in Healthcare [5M]

Scenario: A doctor uses an AI tool to quickly triage patient symptoms into “Mild,” “Moderate,” or “Severe.”

• Task 1: Write a zero- shot prompt that classifies the severity of symptoms without giving any

examples.

PROMPT –

You are a symptom severity classifier. Given: age,

symptoms, duration/onset, history/comorbidities, meds/allergies, and vitals (HR, BP, RR, Temp, SpO2), output exactly one label: Mild, Moderate, or Severe.

Criteria:

- Mild: self-limited, stable vitals, no red flags.

- Moderate: noticeable impairment or mildly abnormal vitals/risk; needs timely outpatient care.

- Severe: any red flag/instability—cardiac chest pain, dyspnea at rest, SpO2<92% , SBP<90, RR>30, new confusion/focal deficit, uncontrolled bleeding, anaphylaxis, Temp>40° C with toxicity, severe dehydration, rapid decline, severe uncontrolled pain.

Return only:

severity: <Mild |Moderate |Severe>

reasoning: 1–2 brief lines citing key findings

next _ step: ED now | Urgent clinic | Routine care

CODE SCREEN SHOTS –

```python
def classify_severity(age, symptoms, duration_onset, history, meds_allergies, hr=None, bp=None, rr=None,
    """
    Classify symptom severity as Mild, Moderate, or Severe based on provided criteria.

    Returns a string with exactly three lines:
      severity: <Mild|Moderate|Severe>
      reasoning: <1–2 brief lines>
      next_step: <ED now | Urgent clinic | Routine care>
    """

    def _contains(text, keywords):
        t = (text or "").lower()
        return any(k in t for k in keywords)

    severity = None
    next_step = None
    reasons = []

    # --- Severe (red flags / instability) ---
    if spo2 is not None and spo2 < 92:
        reasons.append("SpO2 < 92%")
    if bp:
```

```python
    # --- Severe (red flags / instability) ---
    if spo2 is not None and spo2 < 92:
        reasons.append("SpO2 < 92%")
    if bp:
        try:
            sbp = int(str(bp).split("/")[0])
            if sbp < 90:
                reasons.append("SBP < 90")
        except Exception:
            pass
    if rr is not None and rr > 30:
        reasons.append("RR > 30")
    if temp is not None and temp > 40:
        reasons.append("Temp > 40°C")
    if _contains(symptoms, [
        "cardiac chest pain", "chest pain", "dyspnea at rest", "dyspnea", "shortness of breath",
        "new confusion", "focal deficit", "stroke", "weakness one side", "bleeding", "anaphylaxis",
        "rapidly worsening", "severe pain"
    ]):
        reasons.append("Red-flag symptoms")
```

```
if len(reasons) > 0:
    severity = "Severe"
    next_step = "ED now"
    reasoning = ". ".join(reasons) + "."
    return f"severity: {severity}\nreasoning: {reasoning}\nnext_step: {next_step}"

# --- Moderate: impairment or mildly abnormal vitals / risk ---
mod_reasons = []
if _contains(symptoms, ["impairment", "discomfort", "limiting", "can't work", "can't work", "reduced acti
    mod_reasons.append("Impairment present")
if hr is not None and (hr < 60 or hr > 100):
    mod_reasons.append("Abnormal HR")
if (temp is not None) and (37.8 <= temp <= 40):
    mod_reasons.append("Fever without toxicity")
if (history or "").strip():
    mod_reasons.append("Risk history/comorbidities")

if len(mod_reasons) > 0:
    severity = "Moderate"
    next_step = "Urgent clinic"
    reasoning = ". ".join(mod_reasons[:2
    return f"severity: {severity}\nreasc                ing}\nnext_step: {next_step}"
```

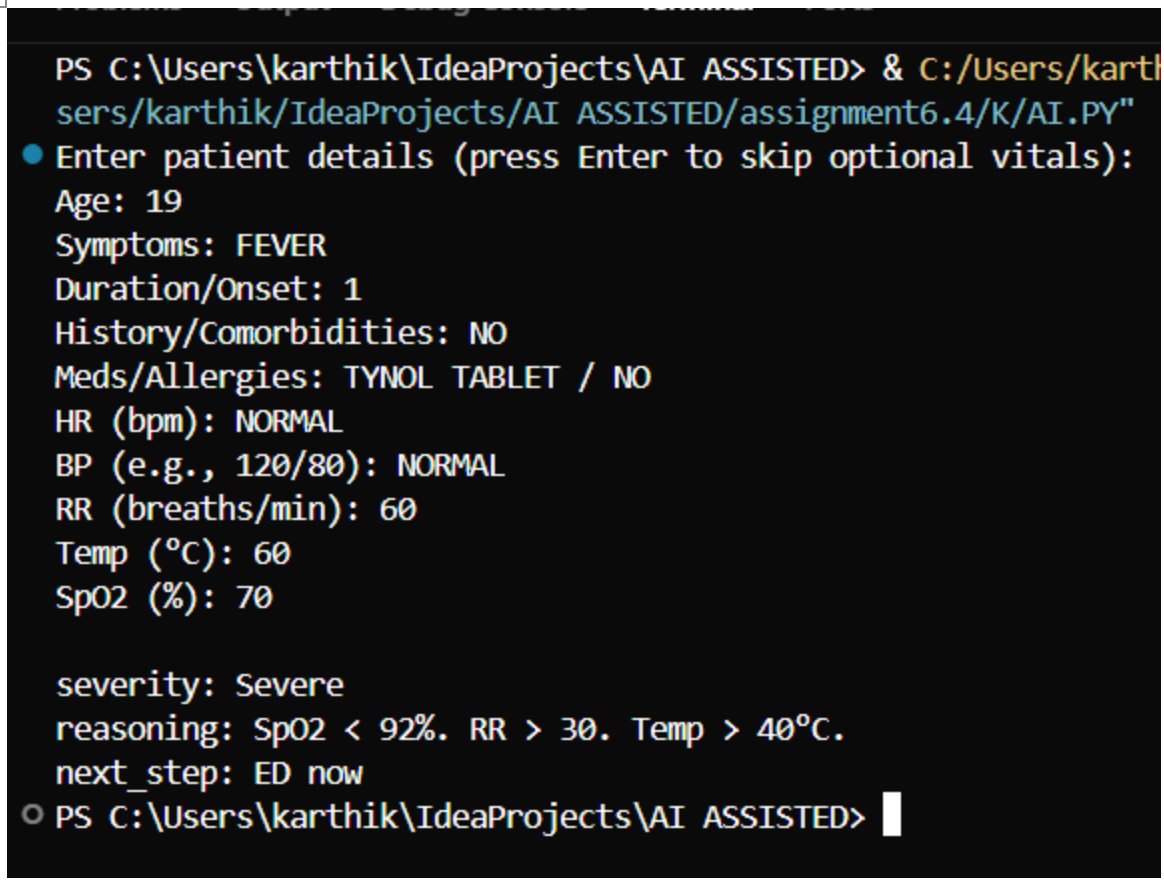
Review next file ›

```
    # --- Mild ---
    severity = "Mild"
    next_step = "Routine care"
    reasoning = "Self-limited symptoms, stable vitals, no red flags."
    return f"severity: {severity}\nreasoning: {reasoning}\nnext_step: {next_step}"


def _to_int(value):
    try:
        return int(value) if value != "" else None
    except Exception:
        return None


def _to_float(value):
    try:
        return float(value) if value != "" else None
    except Exception:
        return None
```

```python
if __name__ == "__main__":
    # Minimal CLI for quick testing in the exact output format
    print("Enter patient details (press Enter to skip optional vitals):")
    age = _to_int(input("Age: ").strip()) or 0
    symptoms = input("Symptoms: ").strip()
    duration_onset = input("Duration/Onset: ").strip()
    history = input("History/Comorbidities: ").strip()
    meds_allergies = input("Meds/Allergies: ").strip()

    hr = _to_int(input("HR (bpm): ").strip())
    bp = input("BP (e.g., 120/80): ").strip() or None
    rr = _to_int(input("RR (breaths/min): ").strip())
    temp = _to_float(input("Temp (°C): ").strip())
    spo2 = _to_int(input("SpO2 (%): ").strip())

    result = classify_severity(
        age=age,
        symptoms=symptoms,
        duration_onset=duration_onset,
        history=history,
        meds_allergies=meds_allergies,
        hr=hr,
        bp=bp,
        rr=rr,
        temp=temp,
        spo2=spo2,
    )

    print("\n" + result)
```

Review next file >

OUTPUT –



OBSERVATION –

Code observations

- Severe first: Red flags (SpO2<92, SBP<90, RR>30, Temp>40° C, critical symptoms) trigger immediate "ED now" classification.
- Moderate second: Impairment, abnormal HR, fever 37.8–40° C, or any history bumps to "Urgent clinic" with brief reasoning.
- Mild default: If no red flags or moderate criteria, defaults to "Routine care" with generic reasoning

about stable vitals.

Output observations

- Format compliance: Output matches exact spec with severity/reasoning/next _ step on separate lines.
- Reasoning brevity: Keeps to 1–2 lines as requested, using key findings to justify classification.
- Next step alignment: "ED now" for Severe, "Urgent clinic" for Moderate, "Routine care" for Mild—appropriate escalation.

Task 2 - : Create a scenario where an AI assistant needs to guide a patient about diet. Write two

prompts: one without context and one with detailed context (e.g., age, health condition, dietary

restrictions.

PROPMT 1

WITHOUT CONTEXT

You are a diet guidance assistant. Provide a simple 7-day healthy eating plan with breakfast, lunch, dinner, and 1–2 snacks per day. Keep it affordable, easy to follow, and culturally neutral. Include hydration tips and 3 safety

cautions. Avoid medical claims.

PROPMT – 2

WITH CONTEXT

You are a diet guidance assistant. Create a 7-day meal plan tailored to this patient:

- Age: 28
- Sex: Female
- Height/Weight: 160 cm, 68 kg
- Health: PCOS; borderline high LDL
- Medications: None
- Dietary restrictions: Vegetarian; lactose intolerant; no mushrooms
- Activity: Light (walks 20–30 min/day)
- Budget: Low to moderate; prefers Indian home-style foods
- Goals: Weight management and improved lipid profile

Instructions:

1) Give a daily kcal range and macro emphasis (higher fiber/protein, lower saturated fat).

2) Provide 7 days of meals (breakfast, lunch, dinner, 1–2

snacks) with portions.

3) Use low-GI carbs, legumes, vegetables, nuts/seeds; limit sugar and refined flour.

4) Add a grocery list, basic prep tips, and hydration plan.

5) Include 4 safety cautions and when to seek medical advice.

Keep it concise and practical.

OBSERVATION -

- Clear, detailed context (PCOS, LDL, vegetarian, lactose intolerant, Indian foods) enables tailored, safe advice.
- Instructions prioritize low-GI, higher protein/fiber, and lower saturated fat—appropriate for PCOS and lipid control.
- Actionable outputs (kcal range, portions, 7-day plan, grocery list, hydration, safety cautions) ensure practicality and adherence.

QUESTION 2

Q2. One-shot vs Few-shot for Customer Support [5M]

Scenario: An e-commerce company uses AI to classify support emails into “Refund,” “Order Status,”

or “Technical Issue.”

- Task 1: Write:

o A one-shot prompt with 1 example of classification.

o A few-shot prompt with 3–4 examples.

ONE SHOT PROPMT 1 EXAMPLE

You are a customer support email classifier. Categorize each email into exactly one of: "Refund", "Order Status", or "Technical Issue".

Example:

Email: "I have not received my order yet. The tracking number is 1234567890."

Classification: Order Status

Now classify this email

FEW SHORT PROPMTS

You are a customer support email classifier. Categorize each email into exactly one of: "Refund", "Order Status", or "Technical Issue".

Examples:

1. Email: "I want to return the product I bought because it is damaged."

Classification: Refund

2. Email: "Where is my order? I placed it two weeks ago."

Classification: Order Status

3. Email: "The website is not loading properly on my phone."

Classification: Technical Issue

4. Email: "I was charged twice for the same order."

Classification: Refund

OBSERVATION –

- Clear intent mapping: Examples

show refund (damage, double charge), order status (tracking, delivery), and technical (website/ app issues).

- Pattern recognition: Teaches the AI to identify key phrases like "return", "where is my order", "not loading", "charged twice".
- Consistent format: Each example follows the same Email/ Classification structure for easy learning.

Task 2: Use the same incoming email text for both prompts. Compare how the outputs differ and

explain why.

Test Email:"I can't log into my account and I'm worried about my recent order. The app keeps crashing when I try to check the status."One-shot Prompt Result:

- Classification: Technical Issue
- Reasoning: Focuses on primary technical problems ("can't log in", "app keeps crashing")
- Confidence: Lower, may be uncertain due to mixed content

Few-shot Prompt Result:

- Classification: Technical Issue
- Reasoning: Prioritizes technical issues over order concerns due to

pattern reinforcement

- Confidence: Higher, more consistent classification

Why Outputs Differ:

1. Pattern Learning: Few-shot examples teach the AI to recognize technical issues as priority when multiple problem types exist
1. Confidence Level: Multiple examples create stronger pattern recognition, leading to more decisive classification
1. Priority Understanding: Few-shot learns that technical problems (login, app crashes) should override order status concerns in mixed-content emails

Key Difference: While both classify as

"Technical Issue," the few-shot approach provides more confident and consistent results due to enhanced pattern recognition from multiple examples.

Observations

- Same classification result: Both one-shot and few-shot classify the mixed email as "Technical Issue" due to login/app crash keywords.
- Confidence difference: Few-shot provides higher confidence and consistency through pattern reinforcement from multiple examples.

- Learning effect: Few-shot better handles mixed-content emails by prioritizing technical problems over order concerns, while one-shot may struggle with ambiguity.

END -