Phase 2: Prompt Engineering Mastery

In Phase 1, I defined Finance as the target domain, with two evaluation tasks, which are Information Synthesis, Classification/Analysis, and Question-Answering. In this phase, I design prompts using three structured frameworks: CLEAR Method, Few-Shot Learning, and Chain-of-Thought (CoT). Each prompt is tailored for its task, with documentation of design rationale, expected output, potential risks, and pilot testing observations.

Task 1: Information Synthesis (Summarizing regulatory filings)
   a. **CLEAR Method Prompt**
Design rationale: Constrains tone, audience, and length so outputs are compliance-ready and investor-focused.
Expected output: ≤200 words, professional, bullet or short-paragraph summary containing Revenue, Net Income, EPS, Cash, top 3 risks, and MD&A highlights; use "not disclosed" when missing.
Failure modes & mitigations:
   ● Omission of forward-looking items → requires an explicit MD&A extraction step in the prompt.
   ● Numeric distortion → instruct model to copy digits verbatim and label source lines.
Pilot (single run / prior note): Summaries are well-structured; occasionally omitted forward-looking language — mitigation: add "explicitly extract forward-looking statements" line.

Prompt:
You are a financial analyst. Summarize the following 10-K/10-Q excerpt for investors. Requirements:
   ● Length: ≤200 words.
   ● Audience: investors with general finance knowledge.
   ● Tone: professional, compliance-ready, concise.
   ● Required fields: Revenue, Net Income, EPS, Cash (if missing, write "not disclosed"), Top 3 risk factors, MD&A main points (including forward-looking statements).
   ● If quoting numbers, copy them exactly from the text and include the sentence location (e.g., "p.12").
Now read the excerpt and produce the summary.

   b. **Few-Shot Prompt**
Design rationale: Two concrete examples set formatting expectations (compact bullet style).
Expected output: Bullet list with metrics and 1–2 line MD&A + risks.
Failure modes & mitigations: Overfitting to examples' phrasing → vary examples' structure and domain vocabulary.
Pilot: More consistent formatting; occasionally too rigid—allow minor paraphrase.

Prompt:
You are a financial analyst. Summarize 10-K/10-Q excerpts for investors in a professional, compliance-ready tone.

Example 1:
Excerpt: "Revenue for FY2024 was $45B, up 8% year-over-year. Net income totaled $5B, EPS $3.2. Cash and equivalents $10B. Risks include supply chain disruptions, regulatory changes, and cyber threats. MD&A highlights focus on expanding digital services and reducing operational costs."
Summary: Revenue $45B, Net Income $5B, EPS $3.2, Cash $10B. Top 3 risks: supply chain disruptions, regulatory changes, and cyber threats. MD&A: focus on digital expansion and cost reduction. (≤200 words)

Example 2:
Excerpt: "Revenue $20B, Net income $2B, EPS $1.1. Cash $3B. Risks: geopolitical tensions, interest rate volatility, competition. MD&A emphasizes R&D investment and market diversification."
Summary: Revenue $20B, Net Income $2B, EPS $1.1, Cash $3B. Top 3 risks: geopolitical tensions, interest rate volatility, and competition. MD&A: focus on R&D and market diversification. (≤200 words)

    c. **Chain-of-Thought Prompt**
Design rationale: Forces stepwise extraction to improve numeric accuracy and evidence linking.
Expected output: Short reasoning trace (hidden or concise) followed by ≤200-word summary.
Failure modes & mitigations: Verbose chain leaking into final summary → instruct "final answer only" after reasoning step.
Pilot: Accuracy improved; needed guardrails to keep the final summary under the word limit.

Prompt:
You are a financial analyst. Summarize 10-K/10-Q excerpts for investors in ≤200 words. Focus on key financial metrics (Revenue, Net Income, EPS, Cash), top 3 risks, and MD&A highlights. Use a professional, compliance-ready tone.

Step-by-step reasoning before summarizing:
1. Identify Revenue, Net Income, EPS, and Cash. If missing, mark as "not disclosed."
2. List the top 3 risk factors mentioned.
3. Extract main points from the Management Discussion & Analysis (MD&A) section.
4. Organize information into a concise, investor-friendly summary.

Task 2: Classification/Analysis (Identifying risk factors)
    a. **CLEAR Method Prompt**
Design rationale: Forces concise label + justification + direct quote to support auditability.
Expected output: For each risk: Label - One-sentence justification with direct quote. If multiple categories apply, provide Primary/Secondary with confidence (High/Med/Low).
Failure modes & mitigations: Borderline cases misclassified → require model to state ambiguous flags and confidence.

Pilot: Accurate on explicit phrasing; struggled with overlapping or implied risks - added confidence fields helped.

Prompt:
You are a risk analyst. Read the following text and classify each risk mentioned into one of four categories: Operational, Regulatory, Market, or Strategic.
Requirements:
- Output format: Risk Label - One-sentence justification with a direct quote from the text.
- If a risk fits more than one category, assign a Primary and Secondary label with confidence (High/Medium/Low).
- Keep responses concise (≤2 sentences per risk).

b. Few-Shot Prompt
Design rationale: 2-3 examples teach correspondence between wording and label.
Expected output: Consistent label + short quote justification.
Failure modes & mitigations: Pattern-match over-reliance → diversify examples across modalities (footnotes, MD&A, risk factors).
Pilot: Higher precision; evidence extraction sometimes requires a verbatim quote to fix.

Prompt:
Example 1
Input: "New EU tax rules may affect company margins."
Output: Regulatory Risk - Justification: "EU tax rules" directly affect compliance and profitability

Example 2
Input: "Revenue fell due to supply chain disruptions in Asia."
Output: Operational Risk - Justification: "supply chain disruptions" hinder core operations

Example 3
Input: "Market volatility reduced investment income this quarter."
Output: Market Risk - Justification: "market volatility" impacts financial performance

Task: Classify each risk in the following text into [Operational, Regulatory, Market, Strategic]. Provide one risk label and one-sentence justification with a direct quote.

c. Chain-of-Thought Prompt
Design rationale: Make the model show reasoning steps (identify distinct risks → map to categories → cite text).
Expected output: Compact reasoning trace + final labels with quotes and confidence.
Failure modes & mitigations: Verbose reasoning → require max 4 bullet steps, then final output.
Pilot: Improved interpretability and consistency; increased length mitigated by step cap.

Prompt:

You are a risk analyst. Classify each risk in the following text into one of four categories: Operational, Regulatory, Market, or Strategic. Use this format: Risk Label - One-sentence justification with a direct quote. If multiple categories apply, provide Primary and Secondary labels with confidence (High/Medium/Low). Keep each rto isk ≤ 2 sentences.
Reasoning steps:
1. Identify each distinct risk mentioned in the text.
2. Determine which of the four categories best fits each risk.
3. If a risk fits multiple categories, assign Primary and Secondary labels with confidence levels.
4. Quote the text directly to justify each classification.
5. Present a concise output for each risk.

Summary:
These prompts demonstrate how different frameworks shape LLM behavior across finance tasks. CLEAR ensures professional tone and compliance, Few-Shot improves formatting consistency, and CoT enhances reasoning depth. Although in practice, finance professionals would likely prefer a hybrid approach: CLEAR for external-facing compliance tasks, Few-Shot for structured classification, and CoT for high-stakes analysis where interpretability is crucial.