Assignment 2: Gen AI Apps for Finance
Due: Thursday, February 13 @ 11:59 PM on Blackboard

Scenario
Lewisville Capital Partners (LCP) is a leading investment bank headquartered in the financial hub of Chicago, operating across global markets. LCP serves institutional investors, high net-worth individuals, and corporations, providing strategic financial solutions tailored to their client's needs.

Recognizing the transformative potential of Generative AI, LCP's executive leadership is exploring how Large Language Models can enhance decision-making, optimize operations, and provide innovative financial solutions. However, different departments have unique needs and are unsure how to integrate AI into their workflows effectively. To address this, the firm has launched an internal innovation initiative, forming a cross-functional task force to design and propose preliminary Gen AI solutions tailored to specific departments.

Assignment
You are a member of LCP's internal AI innovation task force. Choose one of the departments outlined on the final page of this document and design an LLM application to meet its specific needs. Your proposed design should be innovative, clearly communicated to a non-technical audience, and demonstrate a strong understanding of how Gen AI can create business value in investment banking. Your solution should also include a working prototype created in Python to showcase an element of the proposed application (further description below).

Deliverables
You will be submitting your proposal in a slide deck that will be sent out to the LCP's leadership team for their review. Your slide deck should clearly present your application design, functionality and value proposition, a prototype demonstration, and any potential implementation challenges.

Slide Deck Structure:
>   Note: The following is a guideline. Feel free to adapt to better suit your vision!
- **Department Needs and Application Vision (1-2 slides)**
  - Summarize the department's primary needs.
  - Present the overarching vision for your proposed Gen AI application, highlighting its intended impact.
- **Application Design and Functionality (2-3 slides)**
  - Describe how your Gen AI application is intended to function. Include visual aids like mock-ups, diagrams, or schematics to support your explanation.
  - Assume the audience understands the business well but may not be familiar with Gen AI technologies.
- **Prototype Demonstration (1-3 slides)**

- Show screenshots from your application prototype in action, demonstrating specific examples of inputs and outputs.
  - Your prototype should illustrate one (or more) elements of your application design but it does not need to cover every feature. For example, if your design includes an LLM application with one or more LLM prompts as well as some API calls that gather real-time information from the internet, your prototype could be working code for one of the LLM prompts, with some "mock-up" input to show how it works.
  - If your design involves Gen AI prompts or real-time data gathering, you may showcase a working example of an AI prompt with hypothetical inputs.
  - Accompanying your slide deck, submit a Python Jupyter Notebook file containing your prototype code (**Please DO NOT include your API key in your code submission**).
- **Value Proposition and Solutions (1 slide)**
  - Discuss the value your Gen AI application brings to the department, focusing on efficiency gains, cost reductions, customer satisfaction improvements, or revenue growth opportunities.
  - Explain how your application addresses the identified needs of the department.
- **Implementation Challenges and Risks (1 slide)**
  - Identify potential obstacles in deploying your application or risks that might affect project success. Suggest ways these challenges might be mitigated.

Gen AI Policy
- You may use ChatGPT or any other AI tools to help you create your assignment. I encourage you to use ChatGPT or another Gen AI tool to generate examples or hypothetical inputs or data for your application.

Grading
- Your work will be graded according to the rubric below

- **Creativity (30 Points)**
  - Innovation (15 Points): How innovative is the proposed Gen AI solution? Does it introduce a new approach or idea to the department's operation?
  - Applicability (15 Points): How well does the solution incorporate NLP into its design and functionality? Is the use of NLP effective for the end use? Do the NLP capabilities integrate well with the other functions of the application? Are the design choices for NLP appropriate for the technology?
- **Business Needs & Value (40 Points)**
  - Alignment with Business Needs (20 Points): How well does the Gen AI solution address the identified organizational need? Is it relevant and directly beneficial to the chosen department's objectives?
  - Potential for Value Creation (20 Points): Does the solution have the potential to create significant value for LCA? This includes improving operational efficiency,

reducing resource waste, increasing community engagement, expanding the reach of services, or enhancing the organization's overall impact on the community

- **Working Prototype (30 Points)**
  - Functionality (15 Points): Does the prototype function as intended? Is it capable of performing the tasks it was designed for without significant issues?
  - User Experience (15 Points): Is the prototype user-friendly and accessible to its intended users? Does it provide a clear, intuitive interface that supports its operational goals?

Departments and AI Solution Proposals
(Choose 1 of the following)

1. **Mergers & Acquisitions: AI-Powered Due Diligence Assistant**
   - Need: M&A teams spend extensive hours reviewing financial statements, legal contracts, and market trends to assess potential deals.
   - Solution: A Gen AI application that automates the analysis of financial reports, legal documents, and regulatory filings, summarizing key risks and opportunities for potential acquisitions.

2. **Wealth Management: Personalized Financial Advisor Chatbot**
   - Need: Wealth advisors struggle to provide highly personalized portfolio insights in real-time to multiple clients.
   - Solution: An LLM-driven chatbot that generates personalized investment strategies, portfolio reviews, and financial planning advice based on a client's risk profile, goals, and market conditions.

3. **Risk Management: AI-Powered Market Sentiment Analysis**
   - Need: The risk management team requires real-time insights into market sentiment and geopolitical risks to mitigate potential portfolio risks.
   - Solution: A Gen AI-powered sentiment analysis tool that scans financial news, earnings reports, and social media to generate risk assessments and trend predictions.

4. **Equity Research: AI-Driven Investment Reports Generator**
   - Need: Equity analysts must produce in-depth stock analysis and investment reports quickly and efficiently.
   - Solution: A Gen AI tool that generates investment research reports based on financial data, analyst commentary, and market trends, streamlining the report creation process.

5. **Compliance & Regulatory Affairs: AI-Powered Policy and Report Generator**
   - Need: Compliance teams must ensure the firm adheres to financial regulations and prepare compliance reports regularly.
   - Solution: A Gen AI assistant that automates compliance report generation, cross-referencing regulations, and flagging potential violations in trade and client activity records.