AI for Alpha Generation: Roadmap Outline

Phase 1: Foundations - Essential Finance and AI Concepts

1.1 Core Financial Concepts and Intuition

1.2 Setting Up Your Local Python Environment

1.3 Accessing and Understanding Market Data (Numerai API)

1.4 Simple Backtesting with Zipline or Backtrader

Phase 2: Supervised Learning and Factor Models

2.1 Feature Engineering for Finance

2.2 Linear Regression and Factor Models

2.3 Regularization Techniques (Lasso, Ridge)

2.4 Factor-Based Stock Selection Strategy

Phase 3: Deep Learning for Time-Series Forecasting

3.1 Understanding Time Series Data

3.2 LSTM Networks for Stock Price Prediction

3.3 CNNs for Pattern Recognition in Financial Data

3.4 Practical Deep Learning: Model Training and Optimization

Phase 4: Reinforcement Learning and Algorithmic Trading

4.1 Introduction to Reinforcement Learning

4.2 Implementing Simple Trading Policies (Q-learning)

4.3 Policy Gradient Methods and Advanced RL Strategies

4.4 End-to-End Trading Bot Prototype