

NLP in macroeconomics: Prompts

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today

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LLMs in Economics

The advent of large language models (LLMs) that automate a plethora of cognitive tasks presents a significant paradigm shift that academic economists should be cognizant of, given the cognitive

nature of our work, which includes tasks such as data analysis, economic forecasting, and policy recommendation. The rapid advancements in language models could potentially disrupt our profession, necessitating a proactive approach to this emerging technology.

In the short term, these models can augment our productivity by automating routine tasks, thereby allowing us to focus on more complex and nuanced aspects of economic research. However, in the long run, there is a substantial likelihood that these models could displace human economists, as they become increasingly adept at performing complex cognitive tasks. Consequently, it is incumbent upon us to prepare for this eventuality. This could involve developing a deeper understanding of these models to leverage their capabilities effectively, diversifying our skill sets to include areas not easily automated, and advocating for policies that ensure a just transition for those potentially displaced by these technological advancements.

New Developments in LLMs

Recent Innovations:

- Better performance, larger context windows, faster processing.
- Integration of vision and sound capabilities in some LLMs.

Use Cases of LLMs in Economic Research

Domains: - Ideation & Feedback - Writing - Background Research - Coding - Data Analysis - Mathematical Derivations

Ideation and Feedback

Brainstorming

- Can you brainstorm 20 channels through which AI may increase inequality? Limit your response to 10 words (I am restricting) for each point.
- I am an economist working on AI and inequality. Can you brainstorm an outline on [insert topic]? (put any of above mentions like AI and inequality)
- I am an economist working on AI and inequality. Can you brainstorm five potential paper topics and describe each in one sentence?
- I am an economist working on an academic paper on [insert topic]. Can you brainstorm a research plan for me?
- What are the top three pros and cons of working on the economics of AGI?
- Can you suggest ways to improve this paper? (I am attaching economic_update_August_2024.pdf) [Attachment: w30957.pdf] (Korinek 2023 paper)
- Can you draft a referee report for this paper for the *Journal of Economic Literature*? [Attachment: w30957.pdf]
- Would this paper be suitable for the *American Economic Review*?

Providing Counterarguments

- I am working on an economic model that predicts that cognitive automation will increase inequality. What are the top five counterarguments? One line each.

Writing

Paragraph Example

Write a paragraph in the style of an academic economist that integrates the following points. Include a topic sentence:

- Large language models (LLMs) automate many cognitive tasks.
- The work of academic economists is largely cognitive [add examples].
- We economists should therefore worry about recent progress in language models.
- In the short run, these models can help us be more productive.
- In the long run, there is a good likelihood that they will displace human economists.
- We should think about how to prepare [offer solutions].

Editing

Sentence Correction

Can you correct the following sentence? *These paper describe six domain in which large language models (LLMs) displays emergant capbilities that are useful to the economic research.*

Corrections:

- Changed *These paper* to *These papers* for subject-verb agreement.
- Corrected *domain* to *domains* for plural consistency.
- Changed *emergant* to *emergent*.
- Corrected *displays* to *display* for plural subject agreement.
- Added *the* before *economic research* to improve clarity.

Background research

1. Give a concise list of the top five stylistic shortcomings of the following abstract: [abstract here]
2. Rewrite the abstract to correct these shortcomings.

Brainstorming

Brainstorm two or three catchy titles for a paper with the following abstract: [Abstract from chat inserted]:

- “Revolutionizing Economic Research: The Power of Generative AI and Large Language Models”
- “Unleashing AI in Economics: A Comprehensive Guide to Utilizing Large Language Models”

- “The Future of Economic Research: Harnessing the Potential of Generative AI and Large Language Models”

Make them a bit more sober and keep them short.

Promotion (for Social Media)

1. Write three or four posts that summarize the following text. Use simple sentences and make them catchy: [paste your economic outlook paragraph or fiscal position after IMF approval].
2. Can you create a 20-slide deck for the attached economic research paper? [Attachment: w30957.pdf] (economic survey executive summary)

Summarization

- Summarize the following text in one sentence: [Abstract of paper inserted].
 - *The author discusses the potential of Generative AI, specifically large language models like ChatGPT, to revolutionize research in various domains such as ideation, writing, data analysis, coding, and mathematics, and suggests that economists can significantly increase productivity by automating micro-tasks with AI, with the performance of these systems expected to improve over time.*
- Provide a short summary of this paper. [Attachment: w30957.pdf]

Translating Text

Translate the following sentence into Spanish, German, and Finnish: *Generative AI, in particular large language models (LLMs) such as ChatGPT, has the potential to revolutionize research in many disciplines.*

Explaining Concepts

- What are instrumental variables useful for?
- What is the second theorem of welfare economics?

Coding: Python or R

LLMs lead to the greatest productivity gains. Peng et al. (2023) report a controlled experiment in which programmers using OpenAI-powered GitHub Copilot completed their assignments on average 55.8% faster, amounting to a 126% productivity increase.

- Write code to download adjusted close of GOOG, META and MSFT as well as the S&P500 index from 7/1/2014 to 6/30/2023 and save it in a CSV file.
- Simulate the Solow growth model and plot the results in a four chart.
- What does following code do?
- Translate this python code to R or Matlab or vice versa.
- What are data sources to analyse impact of AI on labour force?
- Can you display a graph that shows the performance of these securities normalized to start at 100? [Uploaded stock_data.csv] goog, meta, msft

- Have increased heading
- (ChatGPT Advanced Data Analysis) ctd.: Calculate the beta for each of the stocks and add it to the legend. Change the colors to make them easier to distinguish. Use the title “ One-Decade Performance of Three Big Tech Companies.
- (ChatGPT Advanced Data Analysis) ctd.: Double the size of the title, legend, axes labels, and ticks. Label “^GSPC” in the legend as “S&P 500.”
- (ChatGPT Advanced Data Analysis) ctd.: Assume I put \$100 in each of the three stocks at the start. Can you show a pie chart that shows how much I would have in each stock now?
- (ChatGPT Advanced Data Analysis) ctd.: Can you label each position with its current dollar value in addition to the percentage? Can you make one of the pieces pop out of the pie?
- (GPT-4): Mark got an A in econ and a B+ in math. Sally got an A– in both econ and math. Frank got a B in econ and a C in math. Name and econ grade and math grade. Mark and A and B+ Sally and A– and A– Frank and B and C Convert to csv

Extracting Sentiments

Policy that loosens immigration restrictions on highly educated foreign workers in Pakistan: 1. **A 32-year-old female lawyer in Karachi who is Urdu-speaking.**

2. **A 73-year-old male retired doctor in Multan who is Punjabi.**

3. **A 25-year-old software engineer in Islamabad who is from Khyber Pakhtunkhwa and identifies as nonbinary.**

4. **A 45-year-old female grocery check-out clerk in Lahore who is second-generation Kashmiri.**

5. **A 55-year-old male insurance agent in Sialkot who is Punjabi.**## LaTeX and Equations

LaTeX Code Example

Set up the optimization problem of a consumer with CES preferences over two goods in LaTeX code:

$$U = (x_1^\alpha + (1-\alpha)x_2^\alpha)^\beta$$

Titles for role of AI in Economic Policy

- “AI and Human Synergy in Economic and Fiscal Policy Making”
- “AI-Human Partnership in Shaping Economic and Fiscal Policies”
- “AI and Human Integration in Economic and Fiscal Governance”
- “AI and Human Co-Development in Economic and Fiscal Strategies”
- “AI-Enhanced Collaboration in Economic and Fiscal Policy”
- “AI and Human Alliance in Economic and Fiscal Policy Making”
- “AI-Human Convergence in Economic and Fiscal Governance”
- “AI and Human Teamwork in Economic and Fiscal Policy Design”
- “AI-Driven Collaboration in Economic and Fiscal Policy”

- “AI and Human Cooperation in Economic and Fiscal Policy Making”

Mathematics

- Derive demand functions for goods 1 and 2 in a CES utility function.
- Solve the following system of equations:
 - $3x + 2y = 12$
 - $2x - 3y = 6$ Can you explain what this model is, how to get from one step to the next, and what the intuition for each step is?
- What is the difference between a Cobb-Douglas and a CES utility function?

Prompts wrt Pakistan

Here are the extracted prompts:

1. **Growth Projections for Pakistan Based on Increased Investment and Saving Rates:**
 - “If the government encourages saving and increases financial market development, taking saving to 15% and investment to 22%, what growth projections would result?”
2. **Impact of Reducing VAT/GST Rate in Pakistan:**
 - “If Pakistan reduces its VAT/GST rate from 17% to 10% while enhancing compliance, what will be the potential economic impacts?”
3. **Sacrifice Ratio for Inflation and Economic Growth in Pakistan:**
 - “Given Pakistan’s interest rate of 17% and receding inflation, is there a sacrifice ratio between inflation reduction and economic growth?”
4. **Impact of Increasing Trade-to-GDP Ratio in Pakistan:**
 - “If Pakistan increases its trade-to-GDP ratio from 0.3 to 0.5 through tariff rationalization, how might this impact economic growth?”
5. **Impact of AI on Employment in Highly Populated Countries like Pakistan:**
 - “With AI replacing human labor, what are the implications for employment in a highly populated, unskilled labor market like Pakistan?”
6. **Optimal Tax Policy for Pakistan:**
 - “What would be the optimal tax policy for Pakistan to maximize revenue while ensuring progressive taxation and economic growth?”
7. **Impact of AI on Labor Market in Pakistan:**
 - “How will the integration of AI and automation affect the labor market in Pakistan, particularly in sectors like agriculture and manufacturing?”

Referee Report

Can you draft a referee report for this paper for the Journal of Economic Literature?
[Attachment: w30957.pdf]

Would this paper be suitable for the American Economic Review?

Can you provide a detailed critique of this paper for the Journal of Economic Perspectives?

Write code to download adjusted close of GOOG, META and MSFT as well as the S&P500 index from 7/1/2014 to 6/30/2023 and save it in a CSV file.

Can you display a graph that shows the performance of these securities normalized to start at 100?

Can you calculate the beta for each of the stocks and add it to the legend? Change the colors to make them easier to distinguish. Use the title “One-Decade Performance of Three Big Tech Companies.”

Can you add a horizontal line at $y=100$ to the graph?

Can you add a vertical line at $x=2018$ to the graph?

Can you add a title to the graph?

Capabilities of LLMs

Summary of LLM Capabilities and Usefulness

Category	Task	Usefulness
Ideation and Feedback	Brainstorming	● Highly Useful
	Feedback	● Useful
	Providing counterarguments	● Useful
Writing	Synthesizing text	● Highly Useful
	Editing text	● Highly Useful
	Evaluating text	● Highly Useful
	Converting hand-written equations	○ Experimental
	Generating catchy titles and headlines	● Highly Useful
	Generating tweets to promote a paper	● Highly Useful
	Generating presentation slides	● Highly Useful
Background Research	Summarization	● Highly Useful
	Literature Research	● Useful
	Formatting References	● Highly Useful
	Translating Text	● Highly Useful
	Explaining Concepts	● Useful
Coding	Writing code	● Useful
	Explaining code	● Useful
	Translating code	● Useful
	Debugging code	● Useful
Data Analysis	Locating data sources	● Useful
	Creating figure	

LLMs in Data Analysis

Capabilities: - Locating Data Sources (●) - Creating Figures (●) - Extracting Data from Text (●)
- Sentiment Analysis (●)

LLMs and Mathematical Derivations

Applications: - Setting Up Models (●) - Deriving Equations (○) - Explaining Models (●)

Resources

Here is the text from the image:

Resources

- YouTube Playlist
- AI for Economists: Prompts & Resources
- Causal Inference Substack
- One Useful Thing
- Understanding AI

Other AI sites:

- ChatPDF
- Reeder AI
- Unriddle AI
- Magic School AI

The article provides a framework for experimentation when integrating AI into government work, emphasising the balance between innovation and ethical considerations. Key takeaways (as summarised by ChatGPT) include:

AI as an assistant: AI should be seen as a decision-making assistant rather than a decision-maker, emphasising the importance of human oversight and ethical responsibility in its use. Balancing efficiency and compliance: While it's important to follow guidelines, caution shouldn't prevent experimentation with AI. Creative potential: AI can act as an "extra brain" or "extra hands," helping with tasks like summarising documents and providing diverse perspectives, offering a creative avenue for public servants. Ethical considerations: Public servants should prioritise ethics, avoid using sensitive information, and ensure AI use aligns with public service principles. Informed experimentation: Staying informed without being overwhelmed and experimenting in safe environments can enhance creativity and learning. Transparency: Transparency is crucial; always disclose when AI is being used. Quick wins with AI: AI can boost productivity in areas like drafting documents, summarising information, and analysing data, but rules and regulations must still be adhered to.

Term	Definition
Data augmentation	A technique used in machine learning and deep learning to increase the diversity and amount of training data.
Deep learning	A subset of machine learning that focuses on training computers to perform tasks by learning from data, using neural networks.
Diffusion model	A generative model used for generating high-quality samples and tasks, such as image synthesis.
Discriminative AI	Artificial intelligence that distinguishes between different classes of data.
Discriminative AI models	Models that identify and classify patterns in data, commonly used for prediction and classification tasks.
Foundation models	Broad AI models that can be adapted to create more specialized models or tools for specific use cases.
Generative adversarial network (GAN)	A type of generative model with two neural networks (generator and discriminator) where the generator creates samples and the discriminator evaluates them.
Generative AI	AI that can create new content such as text, images, audio, and video.
Generative AI models	Models that generate new content by understanding the context of the input. Used for automated content creation and communication.
Generative pre-trained transformer (GPT)	A type of large language model developed by OpenAI that uses transformers to understand and generate text.
Large language models (LLMs)	Deep learning models trained on massive text datasets to learn language patterns and structures.
Machine learning	AI focused on creating algorithms and models that enable computers to learn and make predictions or decisions from data.
Natural language processing (NLP)	AI that enables computers to understand, manipulate, and generate human language.
Variational autoencoder (VAE)	A type of generative model that uses a variational autoencoder to generate new content by learning from a dataset of original data.

Prompt Overview

- A prompt is any input or series of instructions used to produce a desired output.
- These instructions help in directing the creativity of a generative model.
- Building blocks of a well-structured prompt include instruction, context, input data, and output indicators.
- These elements help the model comprehend our necessities and generate relevant responses.

What is Prompt Engineering?

- **Define Prompt Engineering:**
 - The practice of designing and refining prompts to guide generative models in producing desired outputs.
-

Importance of Prompt Engineering

- **Relevance and Importance:**
 - Prompt engineering is crucial for improving the accuracy, creativity, and relevance of AI-generated responses.
 - It helps AI systems understand the user's intention and produce better, more aligned results.
-

How to Write Effective Prompts

- **Writing Effective Prompts:**
 - Effective prompts are clear, context-rich, and structured to help AI understand what is expected.
 - The process involves defining the instruction, providing necessary context, and outlining the desired output.

Prompt engineering is a blend of critical analysis, creativity, and technical acumen. It is not limited to asking the right question. It includes framing the question in the right context with the right information and your expectation of desired outcomes to elicit the most appropriate response.

Best Practices for Writing Effective Prompts

Key Dimensions:

- **Clarity:**
 - Use simple and concise language.
 - Avoid ambiguity and vagueness.
- **Context:**
 - Provide background and necessary details.
 - Help the model understand the situation.
- **Precision:**
 - Be specific and give examples.
 - Clearly define the scope and expectations.
- **Role-play:**

- Assume a persona to enhance the response.
- Offer relevant context for better understanding.

Prompt Engineering Techniques

At this point, you have learned the techniques for skillfully crafting prompts that effectively steer generative AI models. You now know the various prompt engineering approaches that optimize the response of generative AI models.

You explored the techniques, including zero-shot and few-shot prompting, using which text prompts can improve the reliability of large language models (LLMs) and yield greater benefits from their responses. You learned how using different approaches such as interview patterns, Chain-of-Thought, and Tree-of-Thought to write prompts helps generative AI models produce more specific, contextual, and customized responses to the user's needs. You even had the opportunity to experience the application of each of these approaches through hands-on lab experiences. You were privy to what experts from the field had to say about the role of prompt engineering in AI.

Specifically, you learned that:

The various techniques using which text prompts can improve the reliability and quality of the output generated from LLMs are task specification, contextual guidance, domain expertise, bias mitigation, framing, and the user feedback loop. The zero-shot prompting technique refers to the capability of LLMs to generate meaningful responses to prompts without needing prior training. The few-shot prompting technique used with LLMs relies on in-context learning, wherein demonstrations are provided in the prompt to steer the model toward better performance. The several benefits of using text prompts with LLMs effectively are increasing the explainability of LLMs, addressing ethical considerations, and building user trust. The interview pattern approach is superior to the conventional prompting approach as it allows a more dynamic and iterative conversation when interacting with generative AI models. The Chain-of-Thought approach strengthens the cognitive abilities of generative AI models and solicits a step-by-step thinking process. The Tree-of-Thought approach is an innovative technique that builds upon the Chain-of-Thought approach and involves structuring prompts hierarchically, akin to a tree, to guide the model's reasoning and output generation.

AI in Economics

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The Economist's Role: Doctors for Economies

- Economists diagnose and solve economic challenges.
- Similar to doctors, who treat patients, economists help economies.
- Both aim to improve the overall health and well-being of their clients—people and nations.

Economic Health Check

- Inflation, geopolitical tensions, and regulatory shifts.

- Impact: Productivity, GDP, and trade balances may decline.
- Solution: AI optimization for economic management.

AI Optimization for Economic Health

- AI helps economies respond to challenges more efficiently.
- Economic data is the lifeblood of national planning.
- AI optimizes economic forecasting, resource allocation, and policy-making.

Traditional AI: Automating Data-Driven Tasks

- AI automates data collection, pattern recognition, and economic modeling.
- Economic policy analysis can be enhanced through AI-driven simulations.
- Faster, more accurate insights into inflation trends, labor markets, and trade flows.

Generative AI: Collaborating with Economists

- Deep learning models create new economic forecasts based on historical data.
- AI analyzes patterns in global trade, inflation, and unemployment rates.
- Helps generate policy scenarios and impact studies, reducing analysis time by up to 90%.

Generative AI in Economic Planning

- Saves time on data entry, analysis, and report generation.
- Quickly structures economic data and forecasts trends.
- Generates actionable insights and policy proposals in shareable formats.

AI Revolutionizing Economic Planning

- Detects anomalies in economic data, explains market variances.
- Creates simulations for policy impact and crisis response.
- AI enhances the economist's ability to handle complex global economic challenges.

Key AI Focus Areas in Economic Policy

- Economic forecasting, fiscal policy, trade modeling, and labor market analysis.
- AI enables more precise economic predictions and faster policy-making.
- Economic planning and analysis see the greatest impact from AI.

Fast Decisions = Economic Growth

- AI accelerates economic decision-making.
- Impacts fiscal policy, trade agreements, and resource allocation.
- Automates data aggregation and provides economic insights (Traditional AI).

Generative AI Capabilities for National Economies

- Detects economic patterns, creates dynamic forecasts.
- Generates market comparisons and policy impact simulations.
- AI-driven models simulate outcomes without affecting the real economy.

ROI from AI Implementation

- 18% growth in economic efficiency through AI implementation.

- 24% improvement in forecasting accuracy with AI operationalization.
- 51% economic ROI through AI optimization and scaling.

Challenges in AI Adoption for Economists

- Concerns: Data security, biases, governance, and public trust.
- Fear of negative impacts on national policy outcomes.
- Solution: Implement strong regulatory frameworks and governance protocols for AI.

AI Empowers, Not Replaces Economists

- AI enhances the efficiency of economic research and analysis.
- Enables economists to focus on strategic tasks and policy recommendations.
- Empowers workers to learn new skills and embrace AI-driven economic models.

Training for an AI-First Economy

- Investment in training for economic analysts in machine learning and AI tools.
- Economists must collaborate with AI for effective policy-making.
- AI democratizes access to complex economic models and forecasts.

Securing AI Buy-In for Economic Transformation

- Economists, policymakers, and stakeholders must support AI integration.
- AI-driven forecasting and policy analysis can be a first use case.
- Align AI technology with national economic goals.

Key Questions for AI Use Cases in Economics

- What are your economic goals? Growth? Stability? Productivity?
- Will AI help achieve better, data-driven decision-making?
- How will a hybrid human-AI approach impact economic planning?

Mapping AI Strategy for Economic Development

- Answer critical questions to create an AI-driven national economic vision.
- Start by piloting AI for targeted economic sectors.
- Scale traditional AI applications and integrate Generative AI for greater impact.

AI and National Economic Agility

- National economies must adapt to global changes faster with AI.
- AI keeps economies competitive in global trade and investment.
- Enables adaptation to new fiscal policies and economic models efficiently.

Tackling Data Overload with AI in Economics

- Difficulty in processing large amounts of economic data.
- Constant changes in global trade, inflation rates, and fiscal policies.
- Impact on accurate forecasting and economic planning.

Generative AI for Data Parsing in Economics

- Ideal for parsing low-variability economic data.

- AI assistants can help ingest and summarize economic reports.
- Automates data handling, reducing the burden on economists.

Gen AI's Value for Economic Research

- Parses through complex economic reports and global trends.
- Answers questions, generates policy insights, and forecasts outcomes.
- Identifies patterns in trade, inflation, and economic growth.

1. Sentiment Analysis of Economic Reports

- **Prompt:** "Analyze the sentiment of the central bank's monetary policy statement to gauge the tone (hawkish or dovish) and its potential impact on interest rates."
- **Application:** Use sentiment analysis to extract whether a central bank is leaning towards raising or lowering interest rates based on the language used in their statements.
- **NLP Task:** Sentiment analysis.
- **Example Tool:** transformers for sentiment analysis.

2. Entity Recognition in Financial Documents

- **Prompt:** "Identify key economic entities (e.g., countries, companies, sectors) mentioned in the IMF's World Economic Outlook and their associated actions or trends."
- **Application:** Automatically extract mentions of entities like "United States", "China", or "Eurozone" from large economic documents and connect them with economic metrics like GDP growth, inflation, or trade policies.
- **NLP Task:** Named Entity Recognition (NER).
- **Example Tool:** spaCy.

3. Topic Modeling of Economic News

- **Prompt:** "Discover the main topics discussed in a large corpus of macroeconomic news articles published during a financial crisis."
- **Application:** Topic modeling helps in identifying the primary concerns (e.g., inflation, unemployment, fiscal policy) during specific macroeconomic events such as recessions or policy shifts.
- **NLP Task:** Topic Modeling (LDA, NMF).
- **Example Tool:** Gensim for topic modeling.

4. Text Summarization of Economic Reports

- **Prompt:** "Summarize the key points of the Federal Reserve's latest FOMC meeting minutes."
- **Application:** Automatically generate concise summaries of long economic documents to save time for economists, policy makers, and analysts.
- **NLP Task:** Text Summarization.
- **Example Tool:** transformers with a summarization model like BART or T5.

5. Economic Sentiment Index from News

- **Prompt:** "Create an Economic Sentiment Index by analyzing the tone of financial news articles published in the last 6 months."

- **Application:** Develop a sentiment index based on the overall tone of economic and financial news to predict market trends or economic cycles.
- **NLP Task:** Sentiment Analysis combined with aggregation.
- **Example Tool:** VADER for financial sentiment analysis.

6. Speech Analysis of Central Bank Governors

- **Prompt:** “Analyze the speeches of central bank governors to identify any shifts in policy direction over the past year.”
- **Application:** By analyzing the speeches, we can track any linguistic patterns or changes in word choice that indicate a shift towards more aggressive or accommodative monetary policy.
- **NLP Task:** Speech-to-text followed by text analysis.
- **Example Tool:** transformers, spaCy, or Google Speech-to-Text.

7. Macro Event Detection from News Streams

- **Prompt:** “Detect macroeconomic events such as policy changes, crises, or market shocks from a continuous stream of financial news.”
- **Application:** Automatically detect and classify major macroeconomic events in real-time from news data, which can be fed into models for trading or economic forecasting.
- **NLP Task:** Event Detection.
- **Example Tool:** spaCy, nltk for event detection.

8. Central Bank Communication Analysis

- **Prompt:** “Track how often inflation and employment-related terms appear in the Federal Reserve’s FOMC meeting minutes and identify trends over time.”
- **Application:** Identify patterns in the frequency of specific economic terms (like “inflation”, “unemployment”, “interest rates”) to understand central bank focus areas.
- **NLP Task:** Frequency Analysis, Text Mining.
- **Example Tool:** nltk or spaCy for word frequency analysis.

9. Sentiment-driven Stock Market Analysis

- **Prompt:** “Examine the relationship between sentiment in economic news and stock market performance for major indices.”
- **Application:** Use NLP-driven sentiment analysis to correlate the mood of economic news with stock market fluctuations, helping to predict short-term market trends.
- **NLP Task:** Sentiment Analysis, Correlation Analysis.
- **Example Tool:** transformers, pandas for data handling.

10. Correlation of Macro Terms with Economic Indicators

- **Prompt:** “Identify the correlation between the occurrence of key macroeconomic terms (e.g., ‘inflation’, ‘recession’) in news and actual economic indicators.”
- **Application:** Track how frequently certain terms are mentioned in the media and correlate them with actual macroeconomic data (e.g., inflation rates or GDP growth) to identify lagging or leading indicators.
- **NLP Task:** Text mining, Correlation Analysis.
- **Example Tool:** pandas, scikit-learn.

11. Extracting Forecast Data from Text

- **Prompt:** “Extract GDP, inflation, and unemployment rate forecasts from economic outlook reports issued by financial institutions.”
- **Application:** Automatically pull key forecast figures from lengthy reports to aggregate predictions and compare them across institutions.
- **NLP Task:** Information Extraction.
- **Example Tool:** spaCy, nltk.

12. Scenario Analysis from Policy Documents

- **Prompt:** “Identify different economic scenarios (best case, worst case) discussed in fiscal policy reports and compare them.”
- **Application:** Extract scenario-based economic forecasts or projections from policy reports to help in decision-making or policy formation.
- **NLP Task:** Text Classification, Information Extraction.
- **Example Tool:** transformers for text classification.

Conclusion

NLP has immense potential in macroeconomics, especially when dealing with large amounts of unstructured data such as financial reports, news articles, and policy documents. By using various NLP techniques, you can extract actionable insights, detect patterns, and even forecast economic variables more effectively.