

Large Language Models for Financial Literacy and Decision Support: Using LLMs to Drive SDG Progress

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Abstract— This project focuses on the development of an industry-specific conversational Large Language Model (LLM) tailored for finance. Leveraging pre-trained models from Hugging Face, the project fine-tunes the model using domain-specific datasets. Advanced fine-tuning techniques, including Parameter-Efficient Fine-Tuning (PEFT), Low-Rank Adaptation (LoRA), and Quantized LoRA (QLoRA), are utilized to optimize training efficiency while maintaining high performance. Implementation and interaction with the fine-tuned model are carried out using Google Colab, which provides an accessible platform for development and demonstration. This project underscores the importance of domain-specific AI solutions in addressing complex challenges in finance, offering significant potential to enhance user experiences and improve decision-making processes.

I. INTRODUCTION

A. BACKGROUND

The United Nations adopted the 2030 Agenda for Sustainable Development in September 2015, setting out 17 goals and 169 targets that address global challenges across social, economic, and environmental dimensions. The SDGs focus on key areas such as poverty eradication, hunger, gender equality, peace, security, and climate change, aiming to create a more just and sustainable world. At the heart of the SDGs are the “5Ps”: People, Prosperity, Partnership, Peace, and Planet, which emphasize the interconnectedness of human rights, social equity, and environmental sustainability. However, the latest “Sustainable Development Goals Report 2023” highlights significant challenges in meeting these targets by 2030, with over half of the indicators showing insufficient progress, and many facing stagnation or regression.

One area where technology can make a meaningful impact is in improving financial inclusion, which is integral to achieving the SDGs. Technology, particularly AI and LLMs, can play a crucial role in accelerating progress towards these goals. By improving financial inclusion, these technologies can empower individuals and communities, leading to economic growth and poverty reduction. AI can enhance financial literacy,

support data-driven decision-making, and optimize resource allocation. By empowering individuals with the knowledge and tools to make informed financial decisions, technology can help bridge gaps in financial accessibility, contributing to both financial independence and broader SDG achievement. Prioritizing the responsible use of these technologies is essential to ensure they align with sustainable, inclusive practices rather than exacerbating existing inequalities.

B. PROBLEM STATEMENT

A significant gap in financial literacy exists among underserved populations worldwide, with many individuals lacking a fundamental understanding of key financial concepts. According to the S&P Global FinLit Survey, 43% of adults are financially illiterate, struggling to grasp basic concepts such as interest rates, investments, and savings. This lack of financial knowledge is a major barrier to financial empowerment, especially for vulnerable groups such as women, the poor, and those with lower educational backgrounds.

Globally, only about one in three adults demonstrate an understanding of basic financial concepts, and the vast majority of people remain unprepared to manage their finances effectively. Even as governments push for greater financial inclusion by expanding access to banking services, these efforts may backfire without a corresponding increase in financial education. Without the necessary financial skills, individuals may fall into debt, mortgage defaults, or even insolvency.

Financial technology offers a promising solution to bridge this gap in financial literacy. By leveraging technology, financial platforms are making financial services more accessible, affordable, and convenient. Mobile apps and digital platforms are reaching underserved populations, even in remote areas, and are providing easier access to financial information. Additionally, these platforms often incorporate interactive tools that make learning about finance more engaging and accessible. They break down complex

financial topics using simple language, and some even personalize content based on user behavior and financial goals. By offering innovative solutions like mobile wallets, peer-to-peer payments, and microfinance platforms, technology in finance is democratizing financial literacy and creating opportunities for financial inclusion. Through these advancements, financial technology is not only improving access to financial services but also empowering individuals to make better financial decisions, thereby reducing the risks associated with financial illiteracy.

II. PROJECT GOALS

A. REAL-WORLD APPLICATION AND OBJECTIVES

The goal of this project is to develop a financial Large Language Model (LLM) tailored to enhancing financial literacy and decision-making capabilities for underserved communities. By harnessing the power of AI, this project aims to bridge the financial literacy gap and promote financial inclusion by offering accessible, scalable, and personalized financial education and guidance. The target audience includes low-income groups, small business owners, and communities that lack access to traditional financial advisory services.

AI's ability to process vast amounts of financial data at lightning speed allows it to identify patterns and trends that may be overlooked by even the most experienced human advisors. This capability can be leveraged to provide actionable insights that are tailored to the specific financial needs. Whether someone is planning for retirement, seeking to optimize cash flow, or managing debt, AI can offer personalized recommendations that cater to their unique financial situation. Key areas where AI can provide support include:

- **Investment Strategies:** AI can assess a person's risk tolerance and financial goals to recommend suitable investment options.
- **Debt Management:** AI can identify opportunities to optimize debt repayment strategies, potentially saving money on interest charges.
- **Budgeting and Savings:** AI can analyze spending habits, suggest areas for potential savings, and even automate transfers to savings accounts.
- **Fraud Detection:** AI can continuously monitor financial transactions for suspicious activity, offering an extra layer of protection against fraud and security risks.

One of the key advantages of AI-driven financial guidance is its scalability and round-the-clock availability. Unlike traditional advisors, AI can offer

24/7 support, allowing individuals to access financial advice whenever they need it, regardless of location or time zone. This is particularly appealing to underserved communities that may lack access to consistent, in-person financial services.

In the evolving landscape of AI-powered financial tools, two standout models, BloombergGPT and FinGPT, have made significant breakthroughs. BloombergGPT, developed by the renowned financial services provider Bloomberg, is a leader in Financial Natural Language Processing (NLP) and has automated various financial tasks, such as sentiment analysis and financial reporting. On the other hand, FinGPT represents an open-source approach to financial LLMs, focusing on accessibility, transparency, and collaboration within the financial industry. These advancements show the potential for AI to revolutionize the way financial services are delivered, particularly to those without easy access to traditional financial advice.

By developing a financial LLM tailored to the needs of underserved populations, this project will foster greater financial literacy and inclusion, helping individuals and communities make informed financial decisions and achieve long-term financial stability.

B. ALIGNMENT WITH SDGs

This project aligns directly with two key Sustainable Development Goals (SDGs): SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth), by promoting financial empowerment and enabling informed economic participation, especially among underserved communities.

Contribution to SDG 1 - No Poverty : The project has a direct contribution to SDG 1, particularly Target 1.4, which aims to ensure that all men and women, especially the poor and vulnerable, have equal rights to economic resources, access to basic services, and financial services, including microfinance. By developing a financial Large Language Model (LLM) tailored to underserved communities, the project seeks to provide individuals in low-income groups with the necessary financial tools and education to improve their economic standing. The AI-driven approach ensures that financial education is accessible to all, regardless of location, education level, or income.

Contribution to SDG 8 - Decent Work and Economic Growth: This project also directly supports SDG 8, particularly Target 8.10, which focuses on strengthening

the capacity of domestic financial institutions to encourage and expand access to banking, insurance, and financial services for all. By leveraging AI to make financial services and education more accessible, the project helps increase financial inclusion, a key enabler of economic participation and growth. Financial guidance provided through the LLM enables individuals, especially those in low-income communities or small business owners, to make more informed decisions regarding investment, debt management, and savings. This allows for greater participation in the formal economy, empowering individuals to engage in economic activities that can contribute to job creation, entrepreneurship, and economic growth. The project also strengthens individuals' ability to access appropriate financial products such as loans, insurance, and investment opportunities, fostering greater economic mobility.

Through its focus on financial empowerment and inclusion, this project aligns with and contributes to both SDG 1 and SDG 8 by providing underserved populations with the financial knowledge and tools necessary to improve their economic situation, participate more fully in the economy, and access essential financial services.

III. METHODOLOGY

A. DATASET

The `finpt-fqa_qa` dataset, part of the FinGPT initiative on Hugging Face, is a specialized collection of approximately 17,100 financial question-and-answer pairs. Its content spans diverse areas, including market analysis, investment strategies, financial product insights, and regulatory compliance. A key feature of this dataset is its emphasis on domain-specific jargon, numerical reasoning, and dynamic financial contexts, making it particularly suitable for tasks requiring precision and contextual awareness. By providing high-quality, well-structured annotations, `finpt-fqa_qa` ensures that models are equipped to navigate the intricacies of the financial domain. Its availability supports researchers and developers in building advanced AI tools tailored for the financial industry, setting a benchmark for domain-specific NLP advancements.

This dataset is highly valuable because it focuses on practical financial scenarios, real-world problem-solving, and domain-specific terminology, which are exactly what a conversational financial assistant needs to perform effectively. Its rich and

diverse content allowed the model to be trained on examples directly relevant to the finance domain, equipping it with a strong understanding of financial jargon and concepts. By using this dataset in the project, the model's ability to respond accurately and meaningfully to financial queries improved significantly.

B. MODEL SELECTION

The Llama-2-7b-chat-hf model was selected for this project because of its strong performance in handling complex, multi-turn dialogues, which is critical for creating an effective financial conversational agent. With 7 billion parameters, the Llama-2 model strikes a balance between computational efficiency and performance, making it suitable for resource-constrained environments while still delivering accurate and contextually relevant responses. Llama-2, a fine-tuned version of the Llama-2 base model, excels in natural language understanding and is specifically optimized for conversational applications, enabling it to maintain coherence and context over extended dialogues—a crucial factor for building a chatbot capable of addressing the varied and often complex financial queries.

Llama-2 is also well-suited for financial applications because of its adaptability to specific domains through fine-tuning on domain-specific datasets. The combination of Llama-2's architectural capabilities and fine-tuning on a domain-specific dataset allows the model to accurately understand and respond to financial jargon, market trends, investment strategies, and more. This makes it a powerful tool for building a financial chatbot that can engage users in meaningful, context-aware conversations. LLaMA 2-7B Chat has been shown to outperform other open-source models in various benchmarks, particularly for instruction-following and safety-aligned response generation, making it a competitive choice for specialized applications like financial assistance. Moreover, the Llama-2 model's open-source nature and availability through platforms like Hugging Face make it highly accessible and customizable, providing flexibility for further improvements and fine-tuning as more specific requirements arise.

C. SYSTEM ARCHITECTURE AND TRAINING DETAILS

The system architecture for developing a financial language model tailored for conversational financial advice is designed to optimize both the data processing and model fine-tuning processes. The architecture can be broken down into several key components:

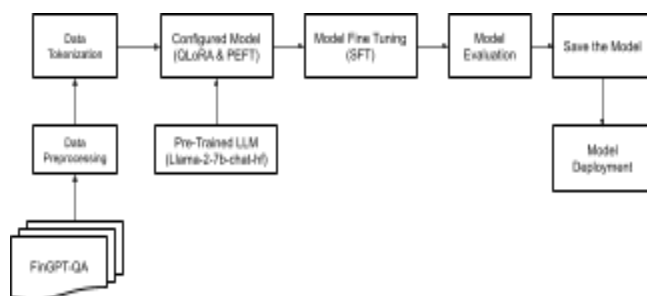


Fig. 1 System Architecture

Dataset Preparation: The dataset used for training the model is sourced from the FinGPT/fingpt-fiq_a_qa dataset. The dataset undergoes preprocessing where the original columns (such as instruction, input, and output) are combined into a single text column. This new column merges the user's instruction with the corresponding output answer, separated by a separator. This ensures that the model learns the conversational format of a prompt-response pair. After transforming the data, unnecessary columns are dropped to streamline the dataset. The data is then split into training and testing sets, with 80% used for training and 20% for testing. To ensure unbiased training, the training data is shuffled.

Model Selection and Setup: The system utilizes the pre-trained Llama-2-7b-chat-hf model from Hugging Face. This model is fine-tuned to handle conversational interactions and is well-suited for applications in customer service, including financial advisory tasks. A new model, referred to as finance-chatbot, is created to represent the fine-tuned model once training is complete. This model is designed to handle financial queries and provide tailored advice.

Training Environment and Configuration: The training configuration uses QLoRA (Quantized Low-Rank Adaptation) to improve memory efficiency during the fine-tuning process. Key parameters such as `lora_r`, `lora_alpha`, and `lora_dropout` are fine-tuned to enhance model performance without overloading the system's memory. The model weights are quantized to 4-bits using `bnb_4bit`, which reduces the memory footprint while maintaining sufficient model performance. Training Arguments from Hugging Face provide the configuration for model training. These include settings for the output directory, batch size, learning rate, number of training epochs, and gradient accumulation steps. A cosine learning rate scheduler is used to adjust the learning rate dynamically during training, ensuring a smooth convergence process.

Model Fine-Tuning: The pre-trained Llama-2 model is fine-tuned on the transformed dataset using Parameter-Efficient Fine-Tuning (PEFT). This approach, specifically LoRA (Low-Rank Adaptation), helps to optimize the training process by modifying only a small subset of parameters, rather than retraining the entire model. This reduces the computational burden and allows the model to be fine-tuned more efficiently, even on hardware with limited resources. The SFTTrainer class is used to handle the training, guiding the model through supervised fine-tuning where it learns to generate financial responses from the dataset.

Model Training Execution: The train method of the SFTTrainer is executed to begin the fine-tuning process. The model is trained on the pre-processed dataset, iteratively adjusting its weights to improve its performance on financial conversational tasks. During training, the model is exposed to various financial scenarios, learning to generate answers that align with real-world financial advice. Once training is complete, the fine-tuned model is saved and stored. The model's performance is evaluated using the test dataset to ensure that it can effectively handle unseen financial queries.

Post-Training Evaluation and Output: After training, the fine-tuned model is evaluated to verify its effectiveness in generating accurate and relevant financial responses. A directory containing the model's weights and other components is generated and saved to the specified output directory.

The system architecture ensures that both the training process and the final model are scalable, allowing the model to be deployed in a real-world setting for providing financial advice to underserved communities.

C. RESULTS

In this project, we extended the model to function as a chatbot, tailored to address financial queries from the perspectives of small business owners, women in underserved communities, and low-income individuals. The model was tested with various finance-related questions relevant to these groups, and qualitative analysis of the responses indicated that the model was able to generate accurate and contextually appropriate advice. For small business owners, it provided useful insights on managing cash flow and insurance related details, while for women from underserved communities, it offered practical advice on budgeting and financial resources. For low-income groups, the model addressed concerns such as managing limited

resources and building emergency funds. Despite the overall positive performance, some limitations were noted, including occasional generalizations, as well as challenges in providing specific financial details or legal advice. Further details on the model's responses, including specific examples, can be found in the appendix. Overall, the results highlight the model's potential in delivering relevant financial guidance, while also identifying areas for future improvement.

IV. ANALYSIS OF COMMUNITY IMPACT

A. SCALABILITY

It is a critical aspect of ensuring that this solution can reach diverse communities with varying needs and resources. Key factors include:

- **Customizability for Different Communities:** The solution can be adapted to cater to varying levels of financial literacy, from basic concepts for beginners to advanced financial guidance for experienced users. This ensures inclusivity across a wide range of demographics.
- **Language and Regional Adaptation:** By fine-tuning the LLM with multilingual support and incorporating regional financial data, the system can address the unique financial challenges of different communities.
- **Technology Integration:** The use of lightweight models enables the solution to scale efficiently, serving urban populations with high-speed internet access and rural communities with limited digital infrastructure.

B. AFFORDABILITY

It is essential for ensuring equitable access to financial literacy tools, especially for underserved communities. The solution achieves this by:

- **Open-Source Foundations:** Leveraging open-source LLMs like Llama-2 reduces initial development costs and provides a foundation for continuous community-driven improvements.
- **Freemium Models:** Offering a basic version for free, supplemented with premium features for advanced users or financial institutions, ensures widespread adoption while generating revenue for sustainability.

C. SUSTAINABILITY

The long-term sustainability of this project relies on its ability to foster lasting improvements in financial literacy and economic participation. This is achieved through:

- **Behavioral Change:** By providing users with accessible and actionable financial advice, the solution encourages better savings habits, investment strategies,

and informed decision-making, contributing to improved financial resilience over time.

- **Economic Empowerment:** Increased financial literacy enables individuals and small businesses to access credit, manage debt effectively, and participate in economic activities, driving community-level economic growth.
- **Collaboration with Stakeholders:** Partnerships with financial institutions, NGOs, and governments ensure the tool remains relevant, up-to-date, and well-integrated into existing financial inclusion initiatives.

V. ETHICAL CONCERNS AND MITIGATION STRATEGIES

Ethical concerns in deploying AI-powered financial literacy tools primarily revolve around bias, privacy, transparency, and accessibility. Bias in training data may lead to outputs that reinforce financial inequalities or provide skewed advice to certain groups. This can be mitigated by incorporating diverse datasets, frequent bias testing, and expert consultation. Privacy risks arise from handling sensitive financial data, which can be addressed through encryption, anonymization, and compliance with regulations like GDPR and CCPA. Transparency is critical to prevent overreliance on AI; users should receive clear disclaimers about the tool's limitations, explanations of its processes, and the data it uses. Accessibility challenges include potential exclusion of users with limited digital skills or internet access. These can be resolved by optimizing for low-bandwidth environments, offering multilingual support, and designing user-friendly interfaces. Together, these strategies aim to ensure ethical, secure, and inclusive AI implementation in finance.

VI. 6. CONCLUSION AND FUTURE WORK

A. SUMMARY OF KEY DELIVERABLES

This project demonstrated the potential of Large Language Models (LLMs) to advance financial literacy and inclusion, particularly for underserved communities. Key accomplishments include:

- Development of a domain-specific conversational financial model fine-tuned using the FinGPT-fiqqa_qa dataset.
- Implementation of efficient training techniques such as PEFT, LoRA, and QLoRA, optimizing resource usage while maintaining high performance.
- Deployment of an accessible, AI-powered financial advisor capable of providing tailored guidance on budgeting, investments, debt management, and more.

- Alignment with Sustainable Development Goals (SDGs) by addressing financial literacy gaps and empowering individuals with knowledge and tools to achieve financial stability.

B. FUTURE WORK

Building on the current progress, the following future directions will further enhance the project's impact and scalability:

- Dataset Expansion: Integrating more diverse and comprehensive datasets, including regional financial data, to improve the model's contextual relevance and reduce biases.
- Multilingual Support: Extending the tool to support multiple languages, enabling broader accessibility for non-English-speaking communities worldwide.
- Real-Time Data Integration: Incorporating real-time financial data and news to offer up-to-date guidance and market insights.
- Collaboration with NGOs and Financial Institutions: Partnering with organizations focused on financial inclusion to deploy the tool in communities with limited access to traditional financial services.
- Interactive Features: Adding functionalities like scenario simulation and interactive tutorials to make financial concepts easier to grasp.

C. GROUP CONTRIBUTION

We agree that all group members made a valuable contribution and therefore believe it is fair that each member receives the same grade for the discussion.

APPENDIX

A. CHATBOT CONVERSATIONS

Scenario 1: In this scenario, we engaged the chatbot with questions related to saving money from the perspective of a low-income individual. The conversation then expanded to explore strategies for building an emergency fund, followed by inquiries on tools and techniques for managing finances within a tight budget. The responses provided by the chatbot offered practical advice and useful resources tailored to the challenges faced by individuals with limited financial means.

Loading the model. This may take some time...

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Your Financial Chatbot is ready! Type 'exit' to end the chat.

User: What are some practical ways to save money when my income barely covers expenses?

FinBot:

You could start by cutting back on all unnecessary spending, and then look for cheaper alternatives. For example, you might be able to get a better deal from your cable or internet provider if you switch to a different service. And there may also be other options available that would allow you to save even more money each month (such as using free online resources instead of paying for access). It's worth taking the time to research these possibilities so that you can make informed decisions about where best to cut costs in order to balance out any necessary expenditures with what is left over after covering necessities like rent/mortgage payments, utilities bills etc... Additionally, it wouldn't hurt either if you tried setting aside something extra each month into an emergency fund just in case unexpected bills come up down the road - having this cushion will help ensure stability no matter how things turn out financially speaking!

User: How to effectively build an emergency fund?

FinBot:

When building an emergency fund, I recommend focusing first on establishing one-time transfers rather than regular contributions since they tend to have less risk associated with them compared to recurring transactions which carry greater risks due mainly because unforeseen events happen at times without warning! To set up automatic transfers consider setting up accounts within your bank account specifically designed only for this purpose; once per month transferring whatever amount desired into those funds while ensuring enough liquidity remains maintained throughout. Once done properly this should give peace of mind knowing that enough reserves exist incase anything goes wrong - allowing continued financial security despite life's ups & downs!

User: Are there tools or apps for managing finances on a tight budget?

FinBot:

Yes, there are plenty of apps and websites built around helping people manage their budgets. Personal Capital is another great option too, though it doesn't offer everything Mint does but its strength lies mostly in investment tracking abilities alongside budgeting oneself! So definitely check those two out before settling on one app versus multiple depending upon specific needs. Also, don't forget checking out sites offering low interest rate credit cards for purchases made during tighter months to avoid going further deep into debt when need arises later on... Remember keeping track of everything spent helps keep track overall leading towards long term goals whether saving money now means sacrifices today OR making adjustments elsewhere so savings grow faster in future years ahead!

User: Exit

Ending the chat. Goodbye!|

Scenario 2: In this scenario, we asked the chatbot about safe financial practices, and the conversation evolved to include advice on how to protect oneself from scams and identify potential fraudulent activities. While the chatbot provided useful guidance, the responses were more general and lacked the specific, actionable details that could have been more helpful in identifying scams in real-world scenarios.

Your Financial Chatbot is ready! Type 'exit' to end the chat.

User: How do I avoid scams or predatory financial practices?

FinBot:

To find out if a lender is legitimate, you can use the database of licensed and exempted moneylenders maintained by Singapore's Ministry of Law. Additionally, check with your local consumer protection agency to see how they regulate loans in your state/province/country. If there are any complaints about this particular company filed through these channels, it may be worth looking elsewhere for your loan needs. Lastly, never borrow more than what's necessary at an interest rate that seems too good to be true - even if you feel like desperate times call for drastic measures! Doing so could lead to debt traps where you end up owing much more than originally agreed upon without having anything tangible showing as collateral against those debts (e.g., real estate). So always read carefully before signing anything pertaining to personal finance transactions; make sure all parties involved have proper identification documents on hand during meetings when discussing business details such as interest rates etc... You get my point here? Just remember one thing: "if something sounds too good to be true then trust me - IT ISN'T!"

User: Who do I get help if I am stuck in a scam?

FinBot:

For fraudulent activity involving credit cards/loans/debit cards / bank accounts, contact the police immediately because time matters here - don't delay reporting incidents no matter whether they happened yesterday morning or last weekend evening at 10 PM after watching Game Of Thrones episodes late night until next day afternoon till 5 PM while enjoying brunch & coffee break from work! The sooner reports go into action, better chances we have fighting back against crooks who want our money but not willing pay us back fairly. But sometimes due to circumstances beyond control, victims cannot report crimes right away - e.g., maybe someone stole their identity documents along with PIN number(s) needed for accessing account balances online via mobile apps provided by banks themselves.

User: How do I protect myself from such scams?

FinBot:

First step would involve educating yourself well on common types of scams happening around today, especially since technology has made life easier yet exposed ourselves more vulnerable towards cyber attacks which include phishing emails sent via spammers pretending to be representatives from reputable companies (i.e., Facebook login credentials), malware downloaded accidentally from infected websites visited daily without taking caution (e.g., antivirus software installed already doesn't mean its update will cover ALL possible threats), hackers exploiting weaknesses found within applications built using open-source code bases (like WordPress), etcetera. Next comes learning ways to spot suspicious activities early enough to prevent damage being done i.e., identifying red flags mentioned earlier plus additional indicators unique only towards specific types of scams targetted toward different demographics - young people tend fall victim easily compared older age groups mainly due lack experience gained over years spent working fulltime jobs thus making them less cautious regarding potential dangers present everywhere online nowadays whereas seniors often get conned just based solely off social engineering tactics utilized during phone calls received claiming urgent assistance required right away.

User: What advice would you give younger people regarding financial scams?

FinBot:

First, let's talk about why some people take risks when dealing with certain situations financially speaking. Sometimes it boils down to laziness combined with impatience - if things aren't going according plan A, then Plan B must surely work too! It makes sense when applied practically across multiple scenarios though sometimes this mindset leads individuals down paths they shouldn't venture into because their emotions cloud judgment leading them into making rash decisions. Second point relates closely related topic - education about managing risk effectively. Knowledge is power indeed! There exist various sources available providing helpful information relevant topics covered here including books written by industry experts specializing areas such economics law enforcement officials.

User: exit

Ending the chat. Goodbye!!

Scenario 3: In this scenario, we interacted with the chatbot from the perspective of a small business owner. We inquired about tax benefits, insurance options for small businesses, and strategies for managing cash flow. The chatbot's responses were thorough and included detailed explanations, often providing examples to enhance understanding.

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Your Financial Chatbot is ready! Type 'exit' to end the chat.

User: What are the tax benefits available for small businesses, and how can I take advantage of them?

FinBot:

The Small Business Health Care Tax Credit provides a refundable credit to eligible small employers who provide health insurance coverage to their employees. This means that even if you owe no income or payroll taxes when you file your return (for example, because of net operating losses), you could still get 50% back on up to \$2500 in qualified expenses paid by the business through March 31st. If you have more than one employee, you might be able to claim additional credits under certain circumstances. In general this is only applicable as long as it's been at least two years since opening shop; otherwise there's just an exclusion from gross income but not any reduction in liability. For details consult Publication 974, Subchapter S Corporations - Self-Employment Tax Relief Act. Another thing worth checking out is whether your state offers anything similar—some states offer matching funds so double check!

User: What types of insurance does my business need?

FinBot:

You should consider purchasing professional liability insurance which protects against negligence claims made by clients. It may also include errors & omissions coverage whereby someone else was injured due to breach of contractual obligation. Other potential options depending upon industry would typically involve worker compensation insurance mandated by law for most companies with W-2 employees (as opposed to independent contractors) covering medical costs resulting from workplace accidents or illnesses sustained during work hours. There's usually something related to property damage too but again depends on what type of business you run—if nothing else then homeowners/rental policies tend to cover things like equipment breakdown etc. Finally think about life insurance if anyone important owns shares...that way they won't end up losing everything after passing away without proper planning ahead while ensuring there aren't any legal battles over assets amongst heirs later down the line either. To answer your question specifically though regarding workers comp I recommend looking into a few different quotes before choosing provider(s). Some firms specialize solely within specific industries such as construction whereas others will write policies across multiple lines including auto dealerships, restaurants etc.

User: What are the best practices for managing cash flow in small business?

FinBot:

Consider using QuickBooks Online instead of Quicken Premium because its features align better with needs of many smaller operations. They recently introduced a new feature called "Cash Flow Projections" that allows users to forecast coming months revenue based off previous months actuals. Additionally QuickBooks has some built in automated reminders to help keep track of bills and other payment schedules to avoid late fees. Don't forget to set aside enough capital reserves whenever possible for unexpected events. If you don't already know this term perhaps start investigating ways of reducing debtor days further (i.e., accounts receivables turnover ratio >1). Aside from accounting software you may want to look into tools offered via online lenders like Lending Club because these allow business loans to grow faster compared to traditional banks especially those targeted toward small enterprises. Last point here pertains mostly to retail operators but sometimes applies elsewhere: keep good records involving inventory levels throughout each year since seasonality affects profit margins significantly in certain sectors.

User: exit

Ending the chat. Goodbye!

Scenario 4: In this scenario, we engaged with the chatbot from the perspective of a woman, asking about safe borrowing options and tax exemptions available for women. The chatbot's responses included relevant information and even incorporated emojis.

Loading the model. This may take some time...

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Your Financial Chatbot is ready! Type 'exit' to end the chat.

User: What are safe borrowing options for women like me?

FinBot:

The only way to find out is by checking with the bank. If you need a loan, I would suggest contacting your local banks and credit unions first because they may have more flexible terms than larger institutions. They also might offer lower interest rates if you're willing to pay them back faster or take on some riskier loans that others won't touch (like those offered through their mortgage department). Additionally, there are many online lenders who specialize in providing loans specifically designed for women - these can be especially useful if you don't want anyone else knowing about how much money we owe! Finally - always check with your local government agencies too; sometimes they provide grants/loans at favorable rates depending upon certain criteria such as income level etc... so it worth doing research before applying anywhere else. It will help save time later when things get tougher down the road since then all our eggs aren't laid into one basket which makes life easier overall 🍋. Do any of these work for you? You mentioned 'safe'. How do these compare compared to other types available from banks & credit unions?

User: They sound okay. What some of the exemptions for women in tax?

FinBot:

Women generally receive less compensation for equal work. So this means that even though you earn enough to cover rent plus utilities and transportation costs but still struggle financially due mainly to lack of representation within corporate America (especially at senior levels), you should look into tax exempt programs provided under federal law which could benefit you greatly! Many states also have similar laws protecting vulnerable populations including low-income families so make sure not miss out on anything important here either 🍋. Some examples include Child Care Credit (if childcare provider isn't employed directly) while another example includes Education Expenses (tuition assistance plans usually qualify). Furthermore, some employers sponsor matching funds programs where they match dollar for dollar up to certain limits set annually toward retirement savings plan contributions made via automatic payroll deductions each month - just remember that any unused balance carries over year after year until used towards something else if needed 🍋.

User: exit

Ending the chat. Goodbye!

Scenario 5: In this scenario, we interacted with the chatbot from a general standpoint, asking about retirement strategies. We followed up on the initial responses with additional questions based on the response the chatbot generated. The chatbot's replies were conversational and human-like, offering advice with caution. It also specifically warned us to be careful when discussing investments, particularly in areas like Bitcoin.



Your Financial Chatbot is ready! Type 'exit' to end the chat.

User: How can I start saving for retirement, and what are the best retirement accounts?

FinBot:
Congratulations on starting your journey to financial independence! Saving money is a great way to prepare yourself for whatever life throws at you. You've asked about retirement savings plans which are tax-advantaged investment plans that allow employees or employers to set aside money each year in order to fund their own future retirements. The most common type of account is called an Individual Retirement Account (IRA), but there are many others out there such as Roth IRAs, 401(k)s, etc. These types of accounts offer different benefits and drawbacks depending on how much money you have saved up so far, when you plan on retiring, and whether or not you want/need access to those funds before then. When deciding between these options it may help to speak with someone who works closely with finances like an accountant because they will be able to give more detailed advice based on YOUR specific situation - rather than just giving general information without considering all factors involved.

User: I am planning to retire in 30 years from now and I have started working a year ago. How should I save for my retirement?

FinBot:
It sounds like you might benefit from speaking with an accountant soon after filing next year's taxes; this person could also potentially answer questions regarding any other concerns you might have regarding your current income versus potential expenses later down the line. If possible try setting aside some extra cash every month into another bank account specifically designated solely towards building wealth through stock market investments until your retirement date arrives - even if only \$5-\$20 per paycheck would make sense here since accumulating large amounts early tends to produce better results over time due to compounding interest rates. Last thing worth mentioning is getting rid of unnecessary debt by consolidating any high interest loans / credit cards where applicable - while being mindful not too rush things unless absolutely necessary given current circumstances otherwise one risks missing important deadlines & losing valuable opportunities elsewhere within one's portfolio allocation strategy.

User: How much is a compounding interest rate usually?

FinBot:
Compound interests tend to vary greatly depending upon the individual case scenario as well as its duration period before reaching maturity dates for example: The annual percentage yield for Allianz Life Insurance Company of New York was advertised last December at around 8%. However please note that the actual rate you receive depends on several factors including: what kind of product do you purchase and under what terms? Can you find similar offers somewhere else? How long does it take for me to reach my goal amount before withdrawal takes place? Does this particular insurance policy come with any additional features that might affect our calculations going forward? All these considerations need careful evaluation so we recommend consultation from an experienced professional during times like today where knowledgeable guidance has never been easier thanks mainly due to modern technology advancements allowing faster communication across vast distances via phone calls/emails / video chats whenever needed regardless location geographies! By doing research properly prior committing toward any particular choice enables anyone looking ahead towards greater success throughout his/her entire lifetime thus enabling them live happier lives overall sooner rather than later!

User: Give me some suggestions for investments

FinBot:
This really depends on YOU personally, so think carefully before making any final choices regarding investment strategies. Some popular investment vehicles include stocks (or equities), mutual funds (which pool together multiple people's monies into one big pot), real estate properties, bonds issued by corporate entities offering fixed returns over specified periods along with dividends paid occasionally if desired...and perhaps cryptocurrencies though keep in mind risk level associated w/these new technologies isn't always apparent at first glance! For instance Bitcoin price jumped recently past weekend mostly caused by rumors China had announced intentions lifting restrictions placed against trading platforms operating inside country leading global markets higher again...but still very volatile right now - ask yourself why do people buy/sell digital currencies often despite unpredictability surrounding prices sometimes resulting in huge gains while sometimes causing major losses? So remember there's no single "best" approach that applies universally - instead look towards diversification as key component ensuring safety net exists for when unexpected events occur (like black swan events).

User: Is Bitcoin investment safe?

FinBot:
That's hard to say especially considering recent surge in BTC value due mainly speculation surrounding regulatory changes expected worldwide involving governments acknowledging legitimacy digital assets. However keep in mind risks associated w/anything new aren't necessarily immediately transparent nor predictable hence caution advised strongly when dealing w/new emergent technologies like cryptos! There's lots written online already discussing various pros n' cons related topics however bottom line remains same - invest wisely using sound judgment based on personal preferences combined w/carefully evaluated available data points relevant your goals.

User: How to identify legitimate digital assets?

FinBot:
First off, understand what exactly defines 'digital asset'. Digital assets can range anywhere from websites & blogs, social media profiles, domain names, patents & trademarks...to name few examples. Now once identified as such, assess authenticity by checking if proper legal documentation exists proving ownership rights; second step involves evaluating quality content provided website owner as well as user reviews posted online by third parties verifying trustworthiness; finally check for active presence on different search engines as absence indicates lesser credibility among consumers thereby lowering reliability factor furthermore compare figures shown official documents submitted earlier against public records found internet searches to ensure accuracy. Keep vigilant throughout whole process keeping eyes open wider possibilities appearing later down road, avoid relying completely any single source & stay updated regarding latest trends occurring industry related areas. Be prepared adapt quickly changing environment since digital space constantly evolving rapidly. Stay informed yet remain skeptical - balancing act requires patience & attention to detail in equal measure! Finally don't forget asking friends family members colleagues alike seeking opinions views from those familiar local circles helping build solid foundation understanding nuances involved decision making processes involved here. Happy hunting everyone!

User: Exit

Ending the chat. Goodbye!

B. DATASET UNAVAILABILITY - URBANSENSE

The Initial LLM project Idea which we were working on was UrbanSense- Enhancing Community Engagement for Sustainable City Development

- In this project we were aiming to make urban areas inclusive, safe, resilient, and sustainable. In many cities, there's a communication gap between citizens and local authorities, which affects the timely resolution of urban issues like infrastructure maintenance, waste management, and public safety etc. We wanted to take up one of the urban issues.
- This would help address critical issues that many cities face. By fostering better communication, we can:

- Accelerate Issue Resolution: Timely addressing issues like infrastructure problems, waste management, and public safety.
- Enhance Citizen Engagement: Empowering citizens to actively participate in city development.
- Improve Urban Planning: Informing decision-making with real-time citizen feedback.

Potential Solutions:

Here are some potential solutions:

- **Citizen Reporting App:**
 - Easy-to-use interface for reporting issues with photos and location data.
 - Real-time issue tracking and status updates.
 - Anonymous reporting options.
- **Community Engagement Platform:**
 - Forums for discussions and idea sharing.
 - Polls and surveys gather public opinion.
 - Interactive maps to visualize city data and citizen reports.

UrbanSense represents a significant step towards creating more inclusive, resilient, and sustainable urban environments. By empowering citizens to actively participate in city development and fostering stronger communication between citizens and local authorities, we can address urban challenges more effectively. The main issue faced in developing was finding the right set of data. So, we had to stop progressing on this for now.

C. CODE

The link to our code is : <https://github.com/Srivashinie/Finance-Chatbot>

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