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**ALY6980 Capstone Project**

**Assignment 12 (Individual Project Proposal)**

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*BuyerFolio AI's AI-Powered Co-Ownership Matching Platform: Data-Informed Property Recommendations and Compatibility Modeling*

1. **Introduction**

Rising property prices are making homeownership more and more unattainable for prospective purchasers, which is posing serious problems to the housing sector. Although shared ownership has become a viable alternative, its widespread adoption is constrained by the lack of organized, data-driven procedures to find compatible co-owners and support well-informed decision-making. BuyerFolio AI suggests an AI-powered platform intended to improve co-ownership options in order to address these problems. To provide users with useful insights, this platform combines advanced analytics, predictive modeling, and data visualization.

**The study's goals**  
By using machine learning models and powerful visualization tools, this project seeks to address issues facing the real estate industry. Three main areas are the focus:

* **Co-Owner Matching:** Using data analytics, possible co-owners are paired according to their preferences and compatibility.
* **Property Recommendations:** Finding appropriate properties that fit preferences for location and budget is the goal of property recommendations.
* **Market Trends Analysis:** Analyzing market trends involves applying predictive models to comprehend and react to new developments in the housing industry.

**Statement of the Problem**The affordability of homes is still a major problem, especially in urban areas where real estate costs are unreasonably high. Because traditional co-ownership arrangements are frequently unstructured, potential buyers lack trustworthy resources to find acceptable partners or appropriate properties.  
  
A promising solution is an AI-powered data-driven platform. Such a website can help democratize homeownership by examining market trends, property preferences, and financial profiles. It guarantees fair access to housing options while giving people the knowledge they need to make wise choices.

**The goal of the research**Designing, creating, and testing an AI-powered platform to enable residential co-ownership is the aim of this study. The following are the main areas of concentration for the project:

* **Finding the Crucial Success Factors:** Ascertain the crucial components that affect co-ownership success, such as financial fit and common goals.
* **Creating Predictive Models:** Create models to improve real estate suggestions and efficiently assess agent performance.
* **Developing Interactive Dashboards:** Construct dashboards that offer up-to-date information on agent performance, market trends, and user preferences.

**Questions for Research:**

1. **Important Characteristics for Co-Owner Matching:**

What qualities, such as similar objectives or financial compatibility, are essential for a successful co-owner match in real estate?

1. **Function of Visual Analytics in Property Selection:**

By offering lucid insights and trend analysis, how might visual analytics enhance the decision-making process for choosing properties?

1. **Predictive Accuracy of Machine Learning Models:**

What factors influence the accuracy and efficacy of machine learning models, and can they accurately anticipate agent ratings?

**Literature Review**

**Article 1**

Galt, A. (2023, December 18). How AI is Revolutionizing Real Estate and Empowering Your Life Choices. Forbes Small Business. Retrieved from <https://www.forbes.com/councils/forbesbusinesscouncil/2023/12/18/unlocking-a-world-of-possibilities-how-ai-is-revolutionizing-real-estate-and-empowering-your-life-choices/>

The article "Unlocking a World of Possibilities: How AI is Revolutionizing Real Estate and Empowering Your Life Choices" emphasizes how artificial intelligence (AI) has a significant impact on the real estate sector. Several facets of purchasing and selling homes are being improved by artificial intelligence (AI), a technology that mimics human reasoning. AI offers important insights into local characteristics, property valuations, and market trends by evaluating enormous volumes of data. As a result, merchants are able to maximize their pricing strategies and buyers are empowered to make informed judgments. But there are several difficulties in incorporating AI into the real estate industry. The possibility of bias in AI systems is a significant worry. This might occur if the training data is skewed or contains discriminatory patterns. To solve this problem, AI technologies must be developed and applied in an ethical, responsible, and transparent manner to guarantee reliability and equity in the decision-making process.  
  
The article "Unlocking a World of Possibilities: How AI is Revolutionizing Real Estate and Empowering Your Life Choices" on BuyerFolio.ai emphasizes how artificial intelligence (AI) is transforming the real estate sector. The study examines AI's wider applicability in the industry, even if the platform's primary goal is to enable co-ownership through AI-driven solutions. The process of becoming a homeowner is streamlined by BuyerFolio's AI-powered platform, which matches potential co-owners based on financial profiles and property preferences. This method not only streamlines the procedure but also increases user engagement. The paper also highlights the general advantages of AI in real estate, including improved market analysis, tailored suggestions, and expedited decision-making.

**Article 2**

Kim, G. H., & Calder-Wang, S. (2024). Coordinated vs Efficient Prices: The Impact of Algorithmic Pricing on Multifamily Rental Markets [Working paper]. Cowles Foundation for Research in Economics, Yale University. Retrieved from <https://cowles.yale.edu/sites/default/files/2024-05/Calder-Wang-main.pdf>

The impact of algorithmic pricing on the US multifamily rental housing market is examined in this article. It looks at how pricing algorithms are used by property management firms to establish unit rental rates. Building managers can efficiently use these algorithms to maximize pricing methods, according to the authors. Evidence of pricing coordination is examined using a structural model. According to the results, a coordination model with partial internalization is better when non-adopters are presumed to price their units around optimal levels, even though a full coordination model performs better than a personal profit maximization model. The impact of algorithmic pricing on renters is also assessed in the essay. It shows that the average monthly rent goes up a little as a result of algorithmic pricing. Tenants, on the other hand, gain from more regular rent reductions and are less likely to experience large rent rises. Overall, the authors draw the conclusion that different renter experiences have distinct effects from algorithmic pricing. Tenants benefit from more regular and predictable monthly payments, which lessen financial anxiety, even when the average rent increases slightly.  
  
The 2024 study by Kim and Calder-Wang on algorithmic pricing in the multifamily renting market offers insightful information that may help BuyerFolio AI develop its co-ownership model. Their study demonstrates how AI-driven pricing might improve market efficiency by striking a balance between maximizing corporate profits and renter affordability. Although BuyerFolio AI doesn't determine rental rates, it might use comparable AI methods to examine past co-ownership information. Trends in co-ownership market-specific price and property preferences may be revealed by this approach. Co-owners could use this information to create fair and competitive pricing plans for assets they jointly own.

**Article 3**

National Bureau of Economic Research (NBER). (2023). Economics of Artificial Intelligence Conference, Fall 2023. Retrieved from <https://www.nber.org/conferences/economics-artificial-intelligence-conference-fall-2023>

The Economics of Artificial Intelligence Conference brought together specialists to talk about the relationship between economics and artificial intelligence (AI) in the fall of 2023. Governor Lisa D. Cook, the keynote speaker, made perceptive comments regarding AI's ability to boost economic growth and solve urgent social issues. Presentations examining the use of machine learning in several economic domains were presented during the conference. The impact of human-algorithm feedback loops on decision-making, the potential of AI to revolutionize sectors like healthcare and finance, and the ability of big language models to generate literature that resembles that of a person were among the topics covered. The growing importance of AI in the contemporary economy and the need for interdisciplinary study to properly understand its ramifications were highlighted at the conference's conclusion.

The goal of BuyerFolio AI is to use artificial intelligence to solve practical problems, and the conversations at the Economics of Artificial Intelligence Conference support this goal. Despite BuyerFolio's emphasis on the real estate sector, the conference's discussion of broader developments in AI applications is reflected in its AI-powered platform. BuyerFolio uses machine learning approaches for data analysis, co-owner matching, and property recommendations, much like scholars have shown how machine learning plays a role in economic decision-making. BuyerFolio wants to enhance real estate decision-making and expedite the co-ownership process by utilizing AI. This reflects the conference's overarching themes, showing how AI developments have the potential to transform not just the real estate industry but also a number of other industries.

**Article 4**

Cesar, M. (2016, December 08). Real Estate: AI for Smarter Transactions. San Francisco Chronicle. Retrieved from[https://www.sfchronicle.com/tech/article/real-estate-ai-smarter-transactions-19542016.phpLinks to an external site.](https://www.sfchronicle.com/tech/article/real-estate-ai-smarter-transactions-19542016.php)

The important issues raised by prejudice in AI systems are examined in the essay "What Do We Do About the Biases in AI?" The study highlights how prejudice can result in unjust and discriminatory consequences, especially when it comes to loan approvals and housing. It emphasizes how crucial proactive management is to the advancement of AI. This entails selecting data with care, including fairness into algorithms, and continuously observing AI systems to spot and lessen prejudice. The essay promotes ethical AI development and implementation as well as responsible AI governance. "What Do We Do About the Biases in AI?" discusses issues related to bias in AI development, despite the fact that it does not offer particular study results. It provides methods for reducing these risks, including making sure AI model training data is inclusive and varied, designing algorithms with fairness in mind from the beginning, and putting monitoring procedures in place to spot possible biases. By putting these tactics into practice, businesses may lessen bias in AI systems while advancing diversity and justice.

The commercial question raised by BuyerFolio.ai is mostly addressed in the essay. No matter their demographics, BuyerFolio's AI-powered matching engine aims to connect co-owners fairly. The article's focus on avoiding AI bias is consistent with BuyerFolio's objective of fostering inclusion and equity on its platform. Additionally, BuyerFolio's development and implementation procedures can be guided by the essay's suggestions for responsible governance and proactive AI management. BuyerFolio can ensure fairness and uphold its inclusive and egalitarian values by using the article's recommendations to strategically lessen prejudice in its AI algorithms.

**Article 5**

Manyika, J., Silberg, J., & Presten, B. (2019, October 25). What do we do about the biases in AI? Harvard Business Review. Retrieved from [https://hbr.org/2019/10/what-do-we-do-about-the-biases-in-aiLinks to an external site.](https://hbr.org/2019/10/what-do-we-do-about-the-biases-in-ai)

The growing role of artificial intelligence (AI) in the real estate sector is examined in the San Francisco Chronicle article Real Estate: AI for Smarter Transactions. It demonstrates how artificial intelligence (AI) is improving decision-making, speeding up transactions, and customizing experiences for both consumers and sellers.  
  
Market analysis is one of the main uses covered, where AI uses big data to predict property prices, spot market trends, and assist with pricing plans. The article also discusses the usage of chatbots, or intelligent assistants, driven by AI, which aid customers with scheduling appointments, navigating complicated real estate deals, and responding to frequently asked questions. Furthermore, by expediting procedures like document creation and review, AI-powered automated documentation is renowned for its capacity to lower human mistake and save time. The paper does, however, note several possible disadvantages of using AI in the real estate industry. The potential for AI to inadvertently propagate economic biases is a serious one. This draws attention to a crucial issue that businesses must deal with as they implement AI technology.

The San Francisco Chronicle article about the application of AI in real estate offers BuyerFolio.ai useful information. The article lists a number of AI applications that support BuyerFolio's objectives, including using AI for process optimization, data analysis, and customized user experiences. The goal of BuyerFolio, which is to streamline co-ownership transactions by offering data-driven matching insights, is in line with the application of AI to improve accuracy and efficiency. Nonetheless, the article's examination of AI's drawbacks—specifically, the perpetuation of social prejudices—highlights the necessity for BuyerFolio to consider equity when developing its AI matching system. BuyerFolio can improve its platform by comprehending how AI is developing and putting anti-bias measures in place. This strategy reduces the dangers of discrimination and unfairness while ensuring that AI is applied efficiently to promote co-ownership opportunities.

**Approach**

The study uses structured analytics and domain-specific insights in a data-driven framework to better understand and improve co-ownership in real estate. The following essential elements are included in the methodology:

1. **Investigative Study:** In order to find trends and biases, exploratory analysis looks at customer preferences, broker affiliations, service areas, and agent evaluations. Basic information on user behavior and market trends is provided by this stage.
2. **Segmenting Data:** The process of profiling data according to user comments, geography, and demographics is known as data segmentation. By classifying patterns and user behaviors within particular groupings, this segmentation aids in the discovery of focused insights.
3. **Forecasting Models:** To predict agent ratings, predictive modeling uses machine learning methods, particularly the Random Forest model. Predictions based on past trends and patterns are made possible by this approach, which also reveals correlations between variables.
4. **Graphics:** Critical findings are visualized using interactive dashboards. These dashboards enable stakeholders to make data-driven decisions by showcasing co-ownership compatibility, agent performance, and market trends.

**Execution of the Strategy**The strategy integrates both public and proprietary databases, uses pilot testing, and draws on the experience of domain experts. This all-encompassing approach guarantees that the results are solid, applicable, and consistent with BuyerFolio AI's objective of democratizing prospects for real estate co-ownership.

1. **Methods**

A mixed-methods approach would be used in the proposed study to get thorough and diversified insights. Both quantitative and qualitative approaches are combined in this strategy. These techniques are intended to give BuyerFolio AI the knowledge it needs to develop into a prosperous co-ownership platform in the real estate sector.

1. **Gathering Quantitative Information:**

This study's foundation will be quantitative data, which supports modeling and decision-making processes by offering objective, quantifiable, and analyzable insights.

1. **Surveys**Structured online surveys will be disseminated to guarantee thorough data collection. These surveys will concentrate on gathering a variety of data in several important areas:

* **Demographic Details:** Potential co-owners' age, marital status, and dwelling location.
* **Financial Profiles**: Financial profiles include income levels, credit scores, debt-to-income ratios, and budgetary restrictions.
* **Property Preferences**: Preferred locations, desired characteristics, types of properties (such as single-family homes or condominiums), and intended use cases (such as primary residence or investment) are all examples of property preferences.
* **Agent Preferences**: Real estate agents' preferred attributes include proficiency in a foreign language, market knowledge, and competence.

1. **Gathering Qualitative Data**

In order to fully capture the intricate preferences and experiences of stakeholders, qualitative data will be used to augment quantitative insights.

1. **Interviews**

* **Real estate agents:** To find out how they feel about co-ownership, the agent-buyer connection, and the challenges of getting top ratings.
* **Prospective Buyers:** To identify the factors influencing decisions about co-ownership and the difficulties encountered during the homeownership process.
* **Industry experts:** To assess trends and insights derived from quantitative data and offer useful recommendations.

1. **Sources of Public and Private Data**

The study will employ both publicly available and proprietary databases to enhance its analysis:

1. **Public statistics:**

* Refer to National Association of Realtors reports and census data to understand regional market trends.
* Broker-run websites that offer agent profiles and performance data.

1. **Proprietary Data:**

* Gathered statistics from real estate platforms that contain information on agent performance, service areas, and client endorsements.
* Internal BuyerFolio AI datasets for feature development and model training.

**Experimental Subjects**

The study will focus on analyzing anonymised data from 100,000 real estate agent profiles in order to extract valuable insights. Among the crucial characteristics are:

1. **The population**

* **Service Area:** Finding the concentrations of active agents in various locations and how they relate to high-demand areas.
* **Spoken Languages:** Analyzing linguistic diversity to assess how well it supports market inclusion and meets the demands of multilingual customers.

1. **The Characteristics of a Professional**

* **Broker Affiliation:** Understanding how major brokerages, including Keller Williams Realty and Coldwell Banker, impact market dynamics.
* **Job Titles:** Assigning agents to specialized roles (like buyer's agent or listing agent) allows for performance evaluation in a variety of areas.
* **Specializations:** Analyzing how specialist information (such as luxury real estate or first-time buyers) affects customer ratings.

1. **Rates client feedback:** Client reviews are mined and examined to gauge agent performance. We'll examine rating-influencing elements such as communication skills, negotiation prowess, and responsiveness.

Combining structured surveys, in-depth interviews, and a range of databases ensures the study's thorough understanding of the real estate ecosystem. These methods will also support the development of predictive models, dashboards, and other tools to help BuyerFolio AI fulfill its goal of giving customers data-driven insights and recommendations.

**Considerations on Data Governance**

Data governance is necessary for BuyerFolio AI to handle sensitive user data in a responsible and safe manner. The platform will take the following important steps to maintain user trust and comply with legal requirements:

1. **Compliance with the GDPR and CCPA rules:**

* **GDPR:** The GDPR ensures that individuals in the EU can see, amend, and delete their data. Users will be able to exercise their rights thanks to BuyerFolio AI.
* **CCPA:** Enables Californian users to know what data is collected, request that their data be deleted, and object to the sale of their data. To protect user privacy, the platform must adhere to these rights.

1. **Encrypting Data for Safe Transmission and Storage**

* **Encryption in Transit:** SSL/TLS protocols will be used to encrypt data exchanged between users and the platform to prevent undesired interception.
* **Encryption at Rest:** User data stored in databases will be encrypted using AES standards, ensuring security even in the case of unauthorized access.

1. **Access Control Based on Roles (RBAC)**

* **Restricted Access:** Access to sensitive information will be restricted based on user roles. This lowers risks by ensuring that only those with permission can read or change specific information.
* **Least Privilege Principle:** The platform will ensure that users may access just the information necessary to carry out their responsibilities by utilizing the least privilege notion.

1. **Minimization and Anonymization of Data**

* **Anonymization:** Identifying information will be separated from analytics and modeling data in order to protect user privacy.
* **Minimization:** Only the data necessary for co-owner matching and property recommendations will be collected in order to avoid unnecessary exposure.

1. **Frequent Reviews of Data Governance and Audits**

* **Internal Audits:** Regular audits will ensure that policies and procedures are followed and that any issues are resolved quickly.
* **Third-Party Audits:** External cybersecurity firms will assess the platform's data security protocols to ensure that industry requirements are met.

BuyerFolio AI will maintain user data, comply with legal obligations, and build user confidence while protecting their security and privacy by implementing these protections.

**Data Analysis Procedures**

1. **Exploratory Data Analysis (EDA):**

A review of agent service regions indicates that Manhattan, New York, is the most active market; the positive lean toward high scores in the agent rating distribution suggests potential biases.

1. **Predictive Modeling:**

* A Random Forest Regressor predicts agent ratings based on job titles, languages, broker names, and specializations.
* A mean squared error of 4.54 indicates moderate accuracy.

1. **Visualization of Data:**

* Dashboards show data on agent performance, broker dynamics, and user preferences.

**Anticipated Ethical Issues**The use of AI in real estate and co-ownership platforms has significant ethical problems that need to be addressed in order to guarantee equity, transparency, and inclusivity:

1. **Algorithmic Prediction Bias:** If training data reflects social biases, predictive models may favor specific groups, leading to biased agent suggestions or co-owner pairings. This could lead to biased treatment of underrepresented groups.

**Mitigation**: Retraining using a range of data will lessen bias and provide equitable outcomes, and regular model audits will ensure equity.

1. **Data Inclusivity and Representation:** The platform's ability to democratize co-ownership would be hampered by a skewed dataset that does not fairly represent a variety of user demographics.

**Mitigation:** The platform will provide equitable data representation by gathering data from several demographic groups, languages, and geographic locations. Fairness algorithms will be used to rectify imbalances.

1. **Transparency in Decision-Making:** If judgments made by AI are not transparent, users may become misinformed and suspicious. Users must understand the reasoning behind particular recommendations or matches.

**Mitigation:** The platform will use explainable AI (XAI) principles to provide clear, understandable explanations for recommendations in order to increase openness.

1. **Privacy and Data Security:** Sensitive data, particularly financial information, needs to be managed carefully to prevent breaches and protect user privacy.

**Mitigation:** The platform will encrypt sensitive data, comply with privacy regulations (including the CCPA and GDPR), and implement strict access restrictions to ensure data protection.

1. **Accessibility for All Users:** People with disabilities or others who are less tech-savvy must be able to use the platform.

**Mitigation:** To ensure usability for all users, the platform will provide resources such as screen readers and educational materials for non-technical users in compliance with accessibility standards (such WCAG).

**Preliminary Studies or Pilot Tests:**

The initial analysis of 100,000 real estate agent profiles yielded significant insights that inform the development of the BuyerFolio AI platform:

1. **Agent Ratings: High Ratings Predominate Due to Selection Effects and Positive Bias**Most agents get high ratings because customers are happy and they don't want to write bad evaluations. This favorable bias and the choice of service-oriented agents may exaggerate the perceived quality of agents.
2. **Broker Dynamics: The dispersion of smaller brokerages is reflected in Keller Williams** **Realty's dominance of the market.**Keller Williams Realty dominates the market, with smaller brokerages holding a fragmented portion. This concentration of key actors will affect how the platform matches agents and co-owners.
3. **Area of Service: Urban areas like Manhattan and Los Angeles have the densest concentration of agents.**   
   Urban areas with the biggest concentrations of real estate agents, such as Manhattan and Los Angeles, have the most active real estate markets. These locations will be the main focus of co-owner matching.
4. **Languages: Spanish and English are the two most commonly spoken languages.**  
   The linguistic diversity of both clients and agents is reflected in the preponderance of Spanish and English. This will guide the platform's multilingual support for increased accessibility.

These early findings set the stage for future enhancements to the platform, including lowering biases, focusing on key markets, and ensuring language inclusion.

**Concluding remarks and suggestions**

The real estate sector is about to undergo a revolution because to BuyerFolio AI's cutting-edge AI-powered residential co-ownership platform. The platform combines machine learning, data analytics, and sophisticated visualization capabilities to address important homeownership issues. This gives potential co-owners better access to strategic and well-informed decision-making. The following elements should be given top priority by the platform in order to achieve long-term success:

* **Including Other Data Sources:** The platform can facilitate more accurate and individualized co-owner matching by incorporating more thorough data, such as lifestyle choices, social preferences, and community involvement. Stronger, longer-lasting co-ownership arrangements would probably result from this.
* **Creating Predictive Models:** Predictive model accuracy can be considerably increased by putting cutting-edge techniques like deep learning and hybrid models into practice. By examining intricate patterns and trends in user preferences and market behaviors, these models are able to maximize agent and property recommendations. The platform will be more dependable and easier to use for people looking into shared ownership opportunities thanks to the improved predictive capability.
* **Focus on Ethical AI:** Maintaining equity and inclusion is essential to BuyerFolio AI's long-term viability. The platform needs to give ethical AI practices top priority by:

1. Identifying potential biases and monitoring AI fairness through routine audits.
2. Testing procedures with a variety of user groups to make sure the platform is usable and advantageous to all users equally.

By combining these tactics—improving predictive modeling and giving ethical AI first priority—BuyerFolio AI can firmly establish itself as a trailblazing pioneer in revolutionizing the shared homeownership industry. These improvements would increase the scalability, equity, and effectiveness of shared ownership in resolving housing issues.

**References:-**

* Galt, A. (2023, December 18). How AI is Revolutionizing Real Estate and Empowering Your Life Choices. Forbes Small Business. Retrieved December 6, 2024 from <https://www.forbes.com/councils/forbesbusinesscouncil/2023/12/18/unlocking-a-world-of-possibilities-how-ai-is-revolutionizing-real-estate-and-empowering-your-life-choices/>
* Kim, G. H., & Calder-Wang, S. (2024, January 24). Coordinated vs Efficient Prices: The Impact of Algorithmic Pricing on Multifamily Rental Markets. Cowles Foundation for Research in Economics, Yale University. Retrieved December 6, 2024 from <https://cowles.yale.edu/sites/default/files/2024-05/Calder-Wang-main.pdf>
* National Bureau of Economic Research (NBER). (2023, February 12). Economics of Artificial Intelligence Conference, Fall 2023. Retrieved December 6, 2024, from <https://www.nber.org/conferences/economics-artificial-intelligence-conference-fall-2023>
* DealMachine. (2023, October 26). The Integration of AI in Real Estate: An Analysis with DealMachine. Retrieved December 6, 2024, from <https://www.dealmachine.com/blog/ai-real-estate>
* ButterflyMX. (2021, July 16). **4 Steps to Use Predictive Analytics in Real Estate.** [ButterflyMX Blog]. Retrieved December 6, 2024, from <https://butterflymx.com/blog/predictive-analytics-real-estate/>

**Appendices:-**

1. **Potential Co-Owners' Survey Questions:**
2. **Financial Compatibility**

* How much do you budget each month for utilities, taxes, and your mortgage?
* Do you have any outstanding debts or other financial commitments that prevent you from making a contribution to property ownership?

1. **Preferences for Properties:**

* What sort of property are you looking to purchase? (For example, a single-family home, apartment, or townhouse)
* Where would you wish to split ownership? (Please specify which neighborhoods or cities you are referring to.)
* Do you have any preferences about the size or quantity of bedrooms on the property?

1. **Co-Ownership Objectives:**

* What is your primary motivation for pursuing co-ownership? (For example, a primary residence, holiday house, or investment)
* Are you open to sharing the property with other people or would you prefer a smaller group of co-owners?

1. **Interests and Lifestyle:**

* Do you have any specific lifestyle preferences that should be considered while selecting a property? (For example, having access to public transit, permitting pets, and being close to schools.)
* What hobbies or interests do you have that might affect your experience as a co-owner, such as frequent travel or working remotely?

1. **Preferences for the Law and Responsibility:**

* Are you aware of the legal agreements that typically accompany co-ownership? Would you need assistance obtaining legal or financial advice?
* How comfortable are you with assigning ownership responsibilities like making decisions and maintaining the property?

1. **Data visualization dashboards**
2. **Distribution of Agent Ratings**

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1. **Top 10 most common broker names**

A graph with numbers and text

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1. **Top 10 Most active real estate markets by agent service area**

**A screenshot of a graph

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1. **Languages preferences by agents**

**A graph of different languages

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1. **Regression analysis output for agent rating predictions**

The section on regression analysis, which also includes the results of the regression analysis for agent rating predictions, presents the following data:

* 4.53705263408719 is the mean squared error, or MSE.
* **Modeling for Prediction:** A Random Forest Regressor model was used to predict agent ratings based on attributes such as job title, languages spoken, specialty, and broker name.
* **Model Performance:** The MSE exhibits a respectable level of accuracy in forecasting agent assessments, with an error margin of approximately 4.54 squared units.

This output suggests that while the model might be improved for more accuracy, it offers some understanding of agent assessments.