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Problem statement - You are tasked with building a data-driven system to provide personalized investment suggestions to users based on their financial circumstances, aspirations, and goals. The objective is to help users make informed investment decisions aligned with their individual profiles and preferences.

- **Performance Aanalysis**

A. Comparing Accuracy of Base Models

After training the model with 60% of the dataset on base learners, the highest accuracy is achieved by the **Linear regression, reaching 85.00%** on the testing data. Following exactly, MLP demonstrates the best accuracy on the testing dataset. Conversely, KNN yields the lowest accuracy on the testing dataset, with a value of 55.00 %.

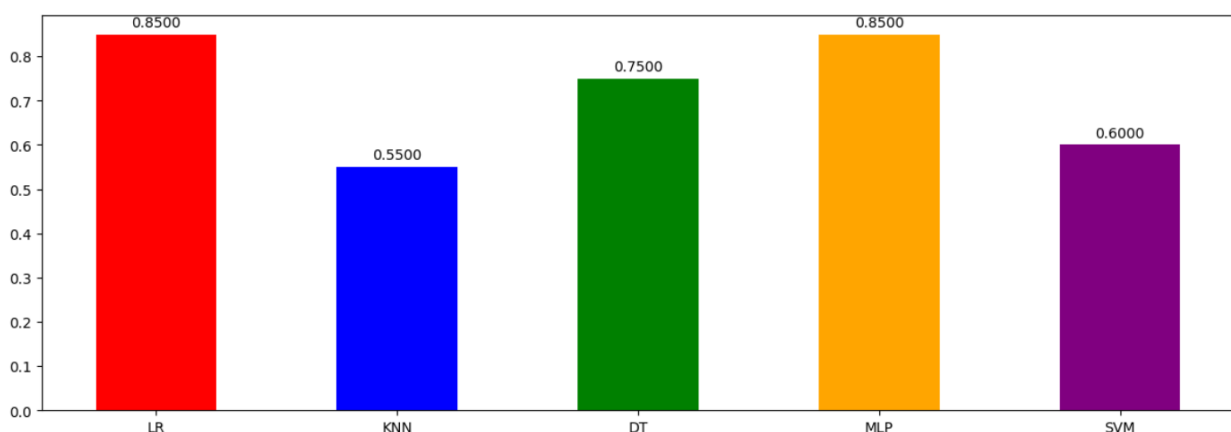


Fig.1. Comparing accuracy of base models

Classifier	Accuracy	Precision	Recall	F1Score
LR	0.85	0.975	0.85	0.886
KNN	0.55	0.537	0.55	0.523
DT	0.75	1.0	0.85	0.903
MLP	0.85	0.975	0.85	0.886
SVM	0.6	0.612	0.60	0.5900

B. Comparing Accuracy of Ensemble Models

After testing the data with the ensemble model, it was observed that **Extra Trees as the base learner achieved the highest accuracy of 90.00%**, followed by all other with an accuracy of 85.00%. Stacking has the lowest accuracy among the ensemble models, with an accuracy of 60.00%.

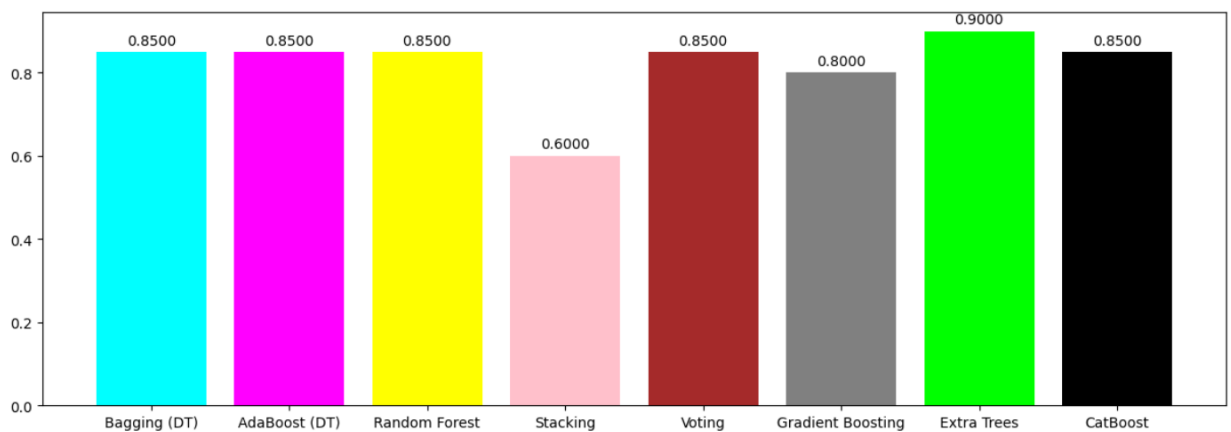


Fig.2. Comparing accuracy of ensemble models

Model	Accuracy	Precision	Recall	F1 Score
Bagging(DT)	0.85	1.0	0.85	0.903
AdaBoost(DT)	0.85	1.0	0.85	0.903
Random Forest	0.85	0.975	0.85	0.886
Stacking	0.60	0.61	0.6	0.595
Voting	0.85	0.975	0.85	0.886
Gradient Boosting	0.80	0.891	0.80	0.816
Extra Trees	0.90	0.975	0.9	0.924
CatBoost	0.85	0.975	0.85	0.886

C. Comparison Of All Model Accuracy

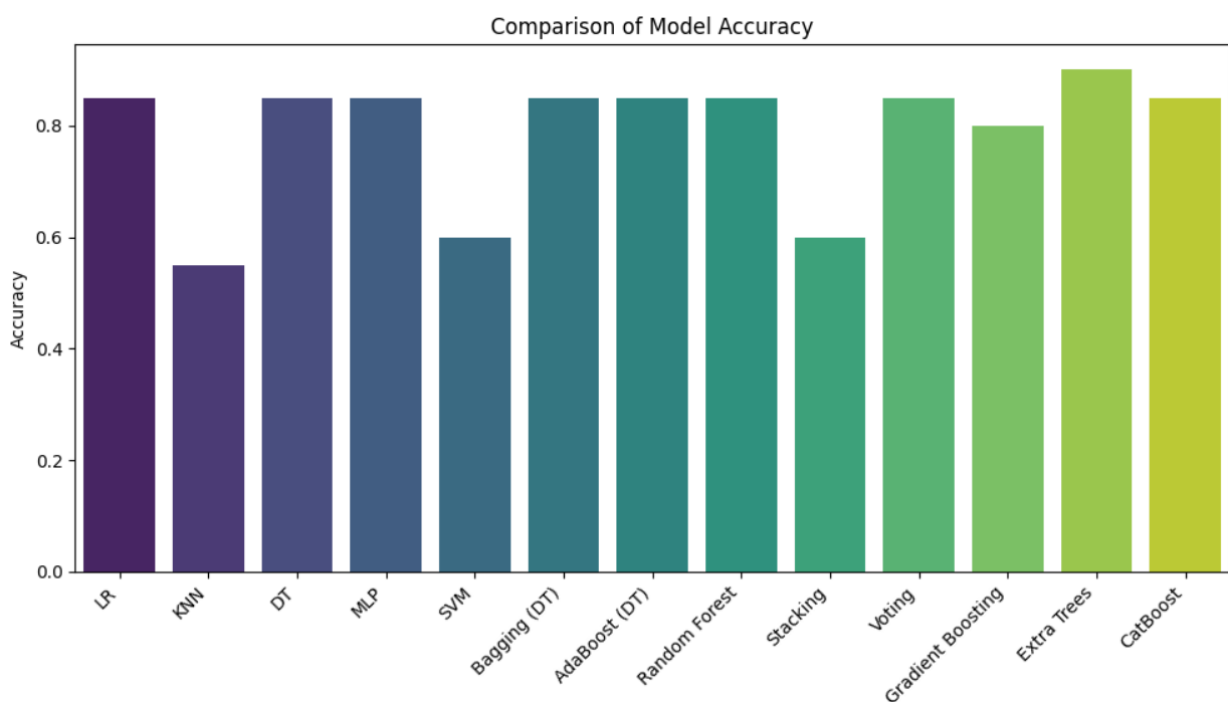
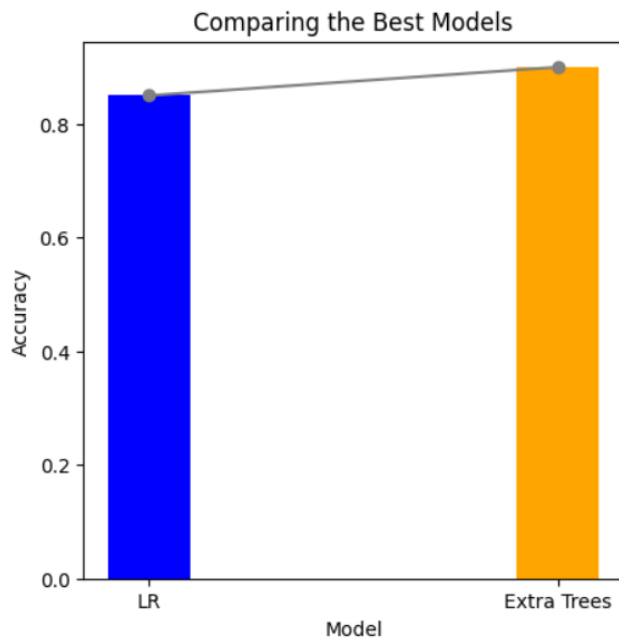


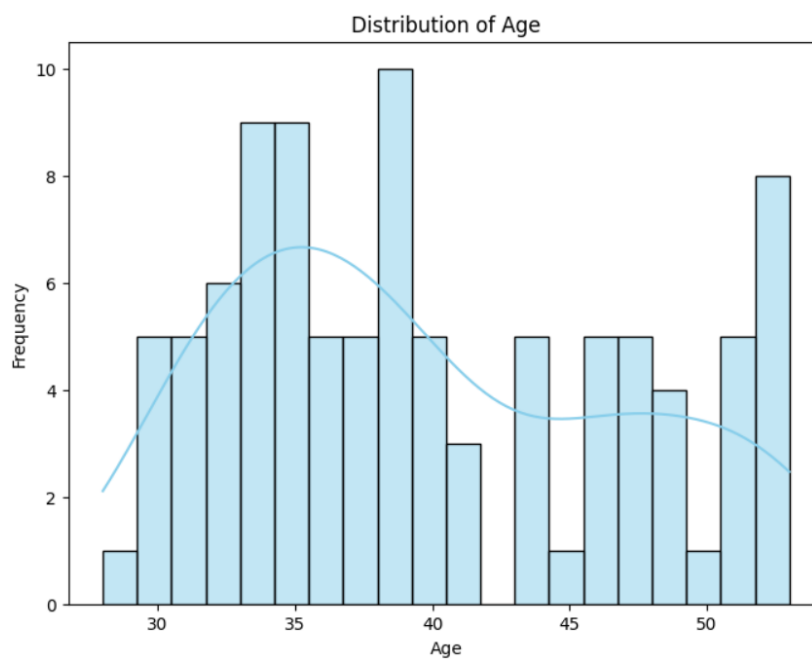
Fig.3. Comparing accuracy of all models



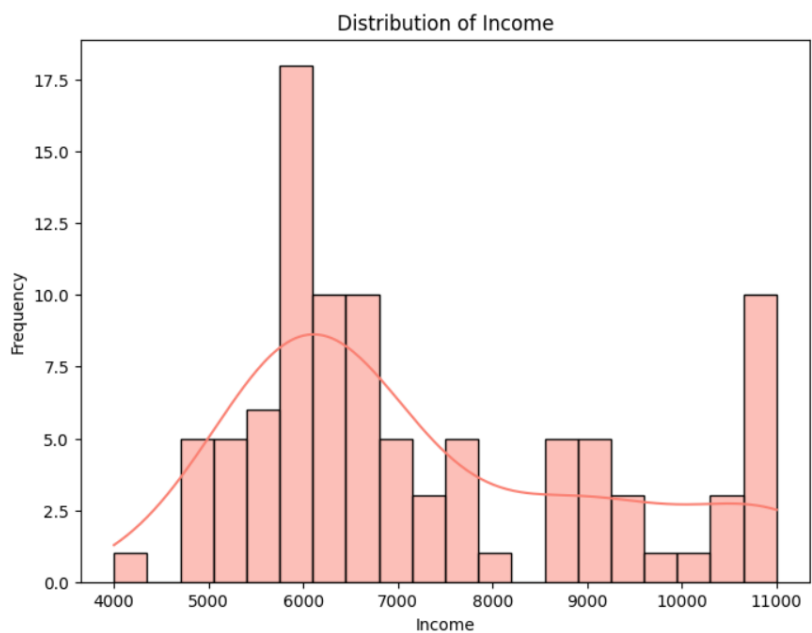
The best model based on accuracy is: **Extra Trees**

D. Visualization using Graphs

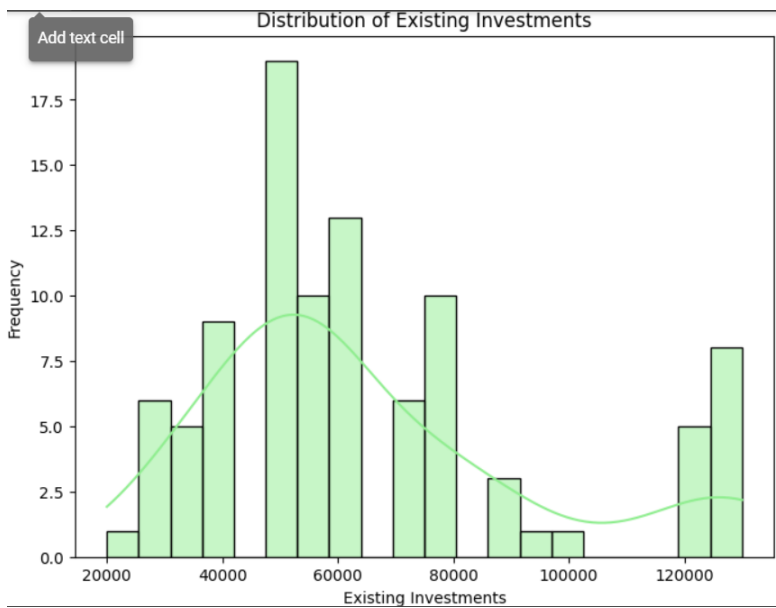
1. Distribution Of Age



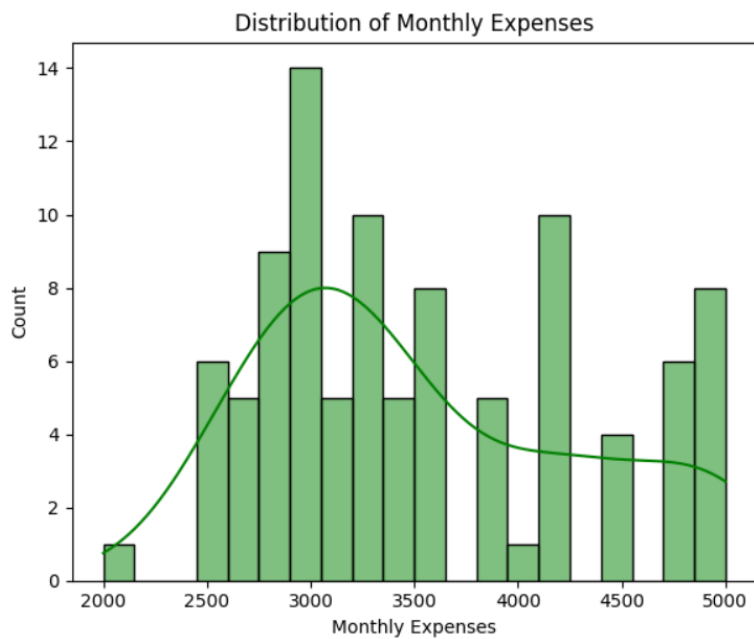
2. Distribution of Income



3. Distribution of Existing Investment



4. Distribution of Monthly Expenses



5. Relationship Between Income and Existing Investment

