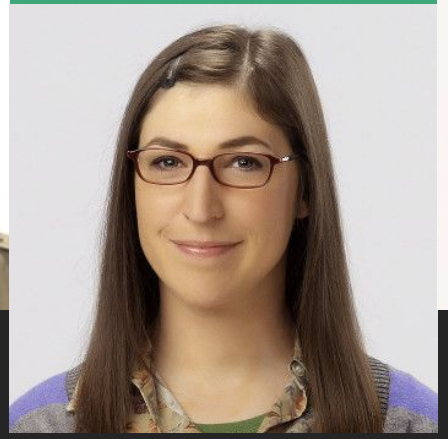
BIG BANG

our Astute&Intelligent team

BIG BANG THEORY

Cary



Demi

Julio

BIG BANG Common Value

“

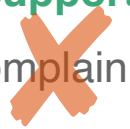
- Keep focusing, keep relevant,
- Make our code simple, concise, readable, and understandable
- Learning how to do the project **as a team**

  Always **give feedback** on time

  Always **ask for help** when need help

  Always **support** when others need help

  Never complain, give each other a warm



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To Understand the New Launched BIG Bank ETF Portfolio with the Power of Machine Learning

DESIGNED BY BIG BANG@UC BERKLEY FINTECH BOOTCAMP
INSTRUCTOR: FIRAS, JENNIFER, and SHAHRIAR
2023/04/04

About

Background

- March was tumultuous for the banking industry.
- Depositors remain concerned, but have faith in larger banks.

As a result, Roundhill Investments launched a new ETF called The BIG Bank ETF (BIGB), which is designed to provide concentrated and cost-efficient exposure to the largest and most liquid U.S. bank stocks.

Problem

Since the BIGB is a relatively new investment option, there is limited data available to individual users for evaluation purposes.

Objective

To address this issue, our team "created" a portfolio called BIG Bank and developed a machine learning-powered app that uses the portfolio's data to help users gain a deeper understanding of BIG Bank.

BIG Bank

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WELLS FARGO

Goldman Sachs

BANK OF AMERICA

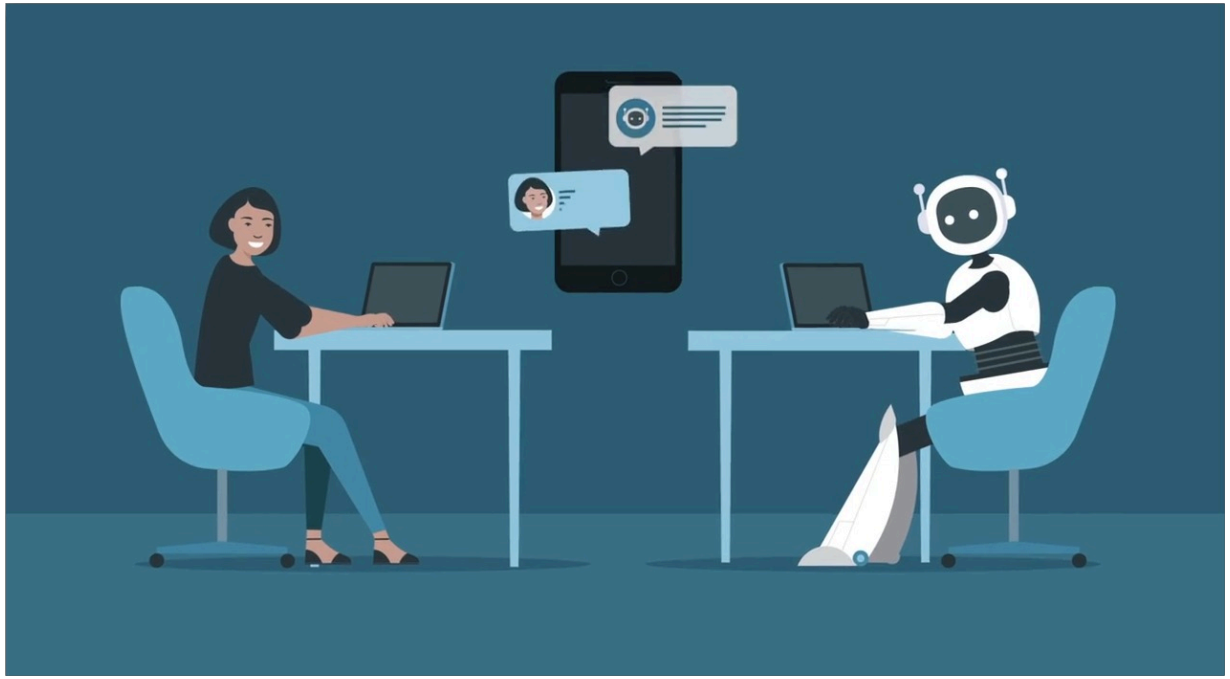
Morgan Stanley

JPMorgan Chase & Co.

- The BIGB ETF is equally weighted, re-balances quarterly, and reconstitutes on an annual basis. BIGB carries an expense ratio of 0.29%.
- It is important to note that, for BIGB portfolio we created, our analysis assumes that no dividend, quarterly re-balancing or annual reconstitution occurred during the historical period we are examining.

Who are our Users?

- **Retail investors** who are **interested in new investment options**, but may not have access to comprehensive tools and data to make informed decisions, especially those **younger generations** who would rather talk to a screen than a person regarding their finances.



Data Preparation

Data Source Yahoo Finance

- Free & Easy to use (dividend function)
- Wide coverage
- Regular updates

Process Data

- Collection Here met a big problem !!!
- Cleanup
- Preparation

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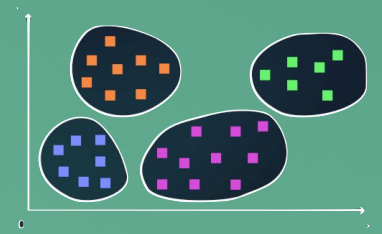
Project Structure

- Scikit-learn
- TensorFlow
- Keras
- Prophet
- Google Colab

Part 1
Unsupervised Machine Learning
Clustering
Annual Return & Annual Volatility Class



Part 2
Time Series Analysis
Heatmap
Check the seasonal patter

Part 3
Supervised Machine Learning
SVC
Rondom Forest
KNN -> Best k
Generate Trading Signals

Cluster

To provide the user with an initial assessment of the risk and reward level of the BIGB ETF, in comparison to benchmark indices such as the S&P 500 or QQQ, as well as other similar ETFs of the banking industry.

01

Time Series Forecast

Plot to check if there is a seasonal pattern in the portfolios price. And if there is, we use SARIMA and ARIAM to predict price, if not, we change to other models.

02

Trading Algorithm with Machine Learning

To provide users a prediction based on trading algorithm, utilizing our chosen machine learning model.

03

Model Training

MODEL

- Mode selection

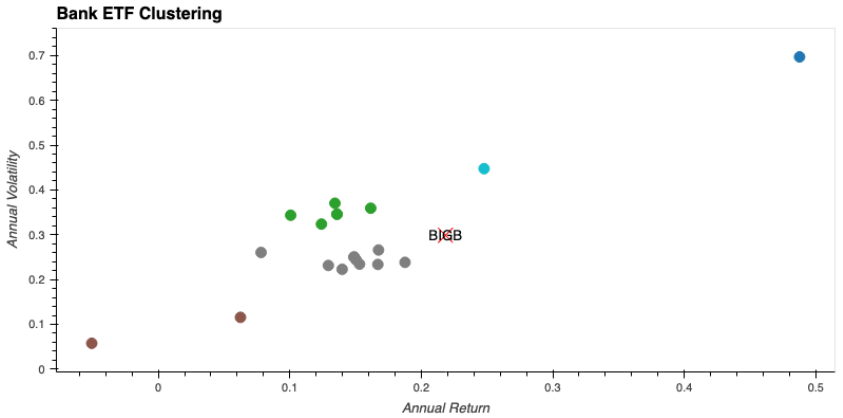
SVC Support Vector Classification
A type of SVM algorithm that is used for binary classification, which is to separate data points into two classes based on their features.

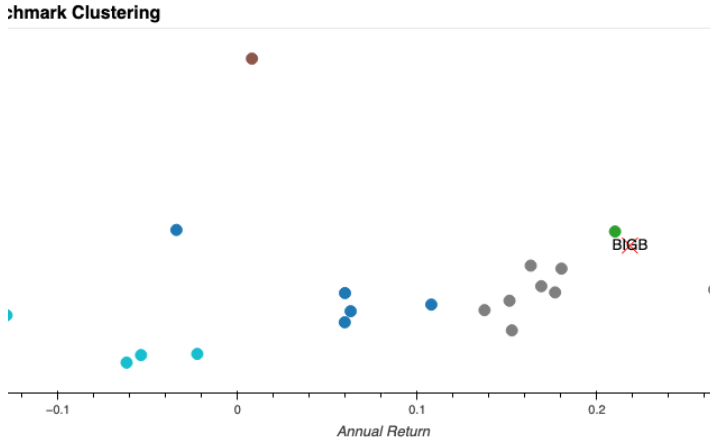
KNN K-Nearest Neighbors
Find best K
A simple and intuitive machine learning algorithm that is commonly used for classification tasks.

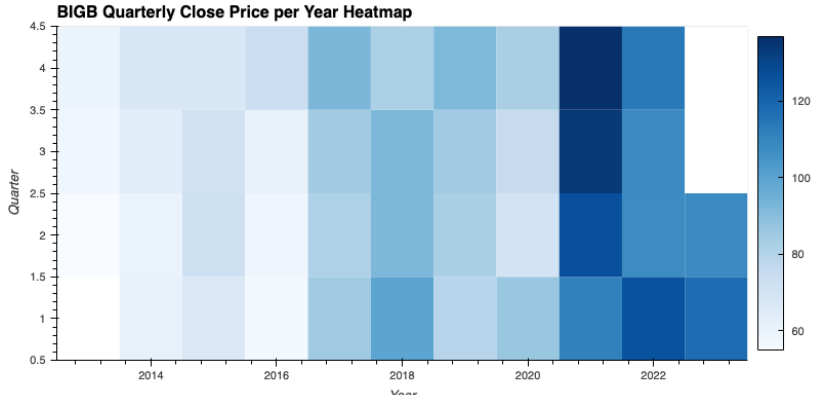
Random Forest
An ensemble learning method which is commonly used for classification tasks. It creates a set of decision trees and combines their predictions to make a final prediction.

- Training
- Backtesting
- Evaluating

Conclusion







Cluster

- Benchmarks ETFs
- Bank industry ETFs

Time Series Forecast

- Seasonal Pattern.
- Prophet > SARIMA

Trading Algorithm

- KNN with Best K > SVC > Random Forest
- BIGB > S&P500

Deployment

User input Questionnaire

Behind the scenes

- Set Variables
  1. Investment Horizon
  2. Initial Capital
  3. Risk Tolerance

User Receive Scatter Plot

Behind the scenes

- 20 Benchmark symbols
- Cluster&plot
- 20 Bank ETF symbols
- Cluster&plot
- To find where is

User Receive Heatmap

Behind the scenes

- Heatmap

  y=Quarter

  x=Year

  C=Close Price

User Receive Forecast Price

Behind the scenes

- Forecast with Prophet

User Receive Predict Return

Behind the scenes

- Short/long Position with SVC

Next Steps

Getting Rich

by This APP

01

Optimize Model

Trace and tune

Model performance

02

Try Different Model

Compare with

Other models

03

Add New Module

Compare with

Similar ETF

04

Expand Scale

Analyze

All new product

05

Improve User Experience

Optimize

Interface

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How We Impact The Financial Industry

- The use of machine learning in this application allows for more accurate and efficient analysis of the BIGB ETF.
- The algorithm uses historical data to identify patterns and predict future trends, enabling users to make informed investment decisions. This can be particularly useful for retail investors who may not have access to sophisticated investment tools or expertise.
- The application's ease of use and accessibility to retail investors can democratize the investment landscape, giving more people the opportunity to invest and potentially earn a profit. This can have a positive impact on the financial industry, as it can lead to increased market liquidity and encourage innovation.

Overall, the introduction of this machine learning application for the BIGB ETF could have a significant impact in terms of democratizing the investment landscape and enabling more informed investment decisions.

The
last but not least
module

THANK YOU