Machine Learning:
Automate your Success in Stocks

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Executive Summary

The goal of our financial application was to allow the user to tell us their specific goals and to use that information to help build a recommendation (buy, sell, hold, etc.) for the user.

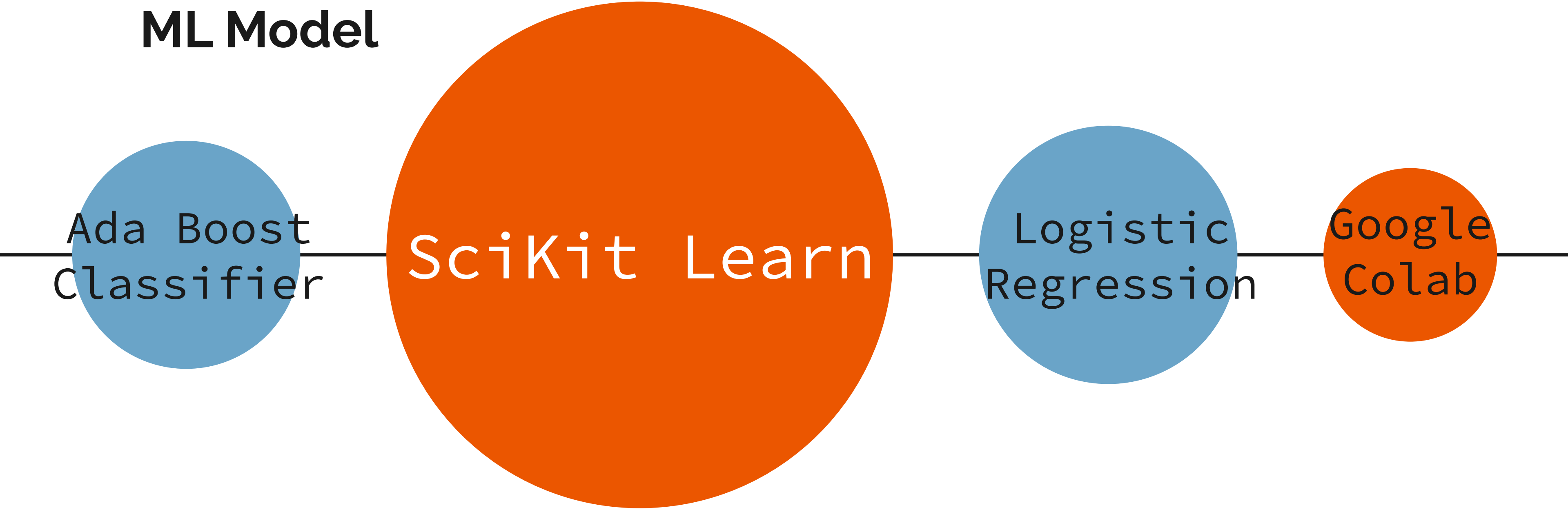
How this relates to Machine Learning and FinTech:

- Used Ada Boost Classifier ML model
- Used Logistic Regression

Research Question:

- How well can we build out a predictive model that will provide the user with buy/sell/hold signals?

ML Model



Ada Boost Classifier

SciKit Learn

Logistic Regression

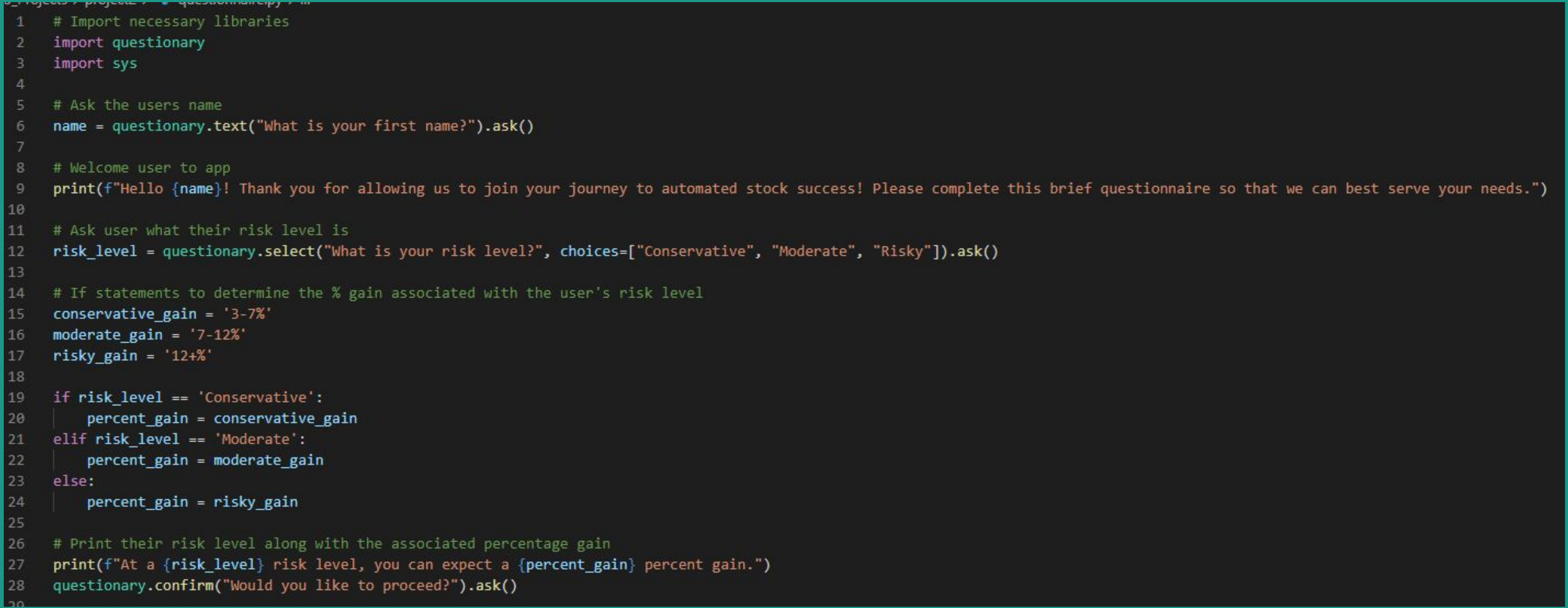
Google Colab

Data Preparation

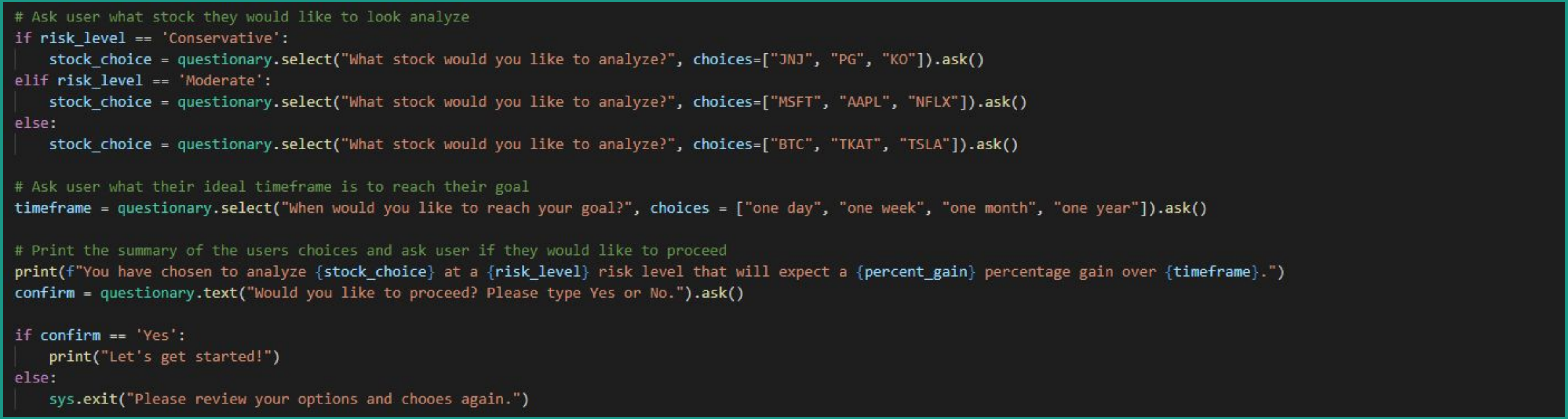
Data Preparation

User Input

1. What is your risk level?
2. What stock would you like to analyze?
3. Timeframe to reach your goal?



```python
# Import necessary libraries
import questionary
import sys

# Ask the users name
name = questionary.text("What is your first name?").ask()

# Welcome user to app
print(f"Hello {name}! Thank you for allowing us to join your journey to automated stock success! Please complete this brief questionnaire so that we can best serve your needs.")

# Ask user what their risk level is
risk_level = questionary.select("What is your risk level?", choices=["Conservative", "Moderate", "Risky"]).ask()

# If statements to determine the % gain associated with the user's risk level
conservative_gain = '3-7%'
moderate_gain = '7-12%'
risky_gain = '12+%'

if risk_level == 'Conservative':
    percent_gain = conservative_gain
elif risk_level == 'Moderate':
    percent_gain = moderate_gain
else:
    percent_gain = risky_gain

# Print their risk level along with the associated percentage gain
print(f"At a {risk_level} risk level, you can expect a {percent_gain} percent gain.")
questionary.confirm("Would you like to proceed?").ask()
```



```
# Ask user what stock they would like to look analyze
if risk_level == 'Conservative':
    stock_choice = questionary.select("What stock would you like to analyze?", choices=["JNJ", "PG", "KO"]).ask()
elif risk_level == 'Moderate':
    stock_choice = questionary.select("What stock would you like to analyze?", choices=["MSFT", "AAPL", "NFLX"]).ask()
else:
    stock_choice = questionary.select("What stock would you like to analyze?", choices=["BTC", "TKAT", "TSLA"]).ask()

# Ask user what their ideal timeframe is to reach their goal
timeframe = questionary.select("When would you like to reach your goal?", choices = ["one day", "one week", "one month", "one year"]).ask()

# Print the summary of the users choices and ask user if they would like to proceed
print(f"You have chosen to analyze {stock_choice} at a {risk_level} risk level that will expect a {percent_gain} percentage gain over {timeframe}.")
confirm = questionary.text("Would you like to proceed? Please type Yes or No.").ask()

if confirm == 'Yes':
    print("Let's get started!")
else:
    sys.exit("Please review your options and chooes again.")
```

Data Preparation

Pulling in the data

```
Import yfinance as yf

tickers = yf.Ticker(stock_choice)

df = pd.DataFrame(tickers.history(start=”2016-10-02”, end = “2021-10-07”, interval = “1d”))
df
```

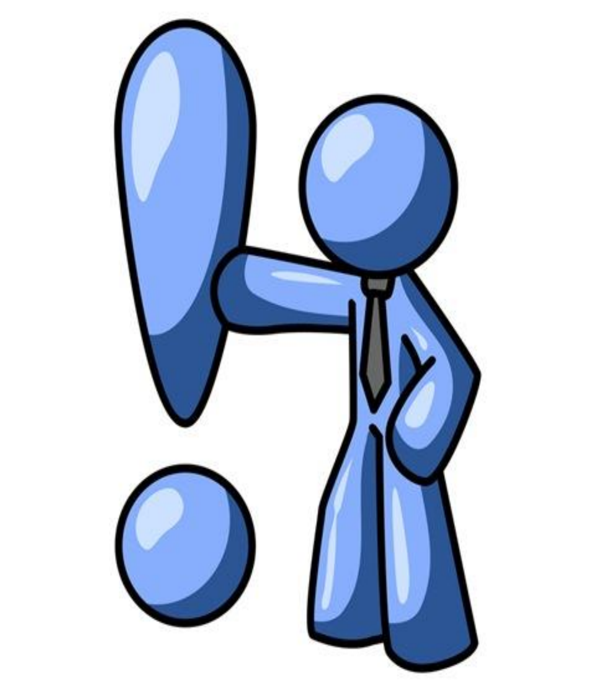
```
close_df = close_df.dropna()
```

Our Approach

1. Allow a user to select an investment based on their risk tolerance.
    a. Questionnaire
2. Output technical analysis based on their selection
    a. RSI, SMA, MACD
3. Analyze their potential returns by running their input through our machine learning model to predict performance
4. Compare technical analysis data points with machine learning data
    a. RSI over 70 / under 30.
    b. MACD crossover points

Brief Demo

Conclusion



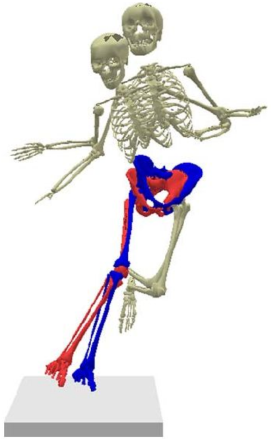
We were able to successfully create a program that uses 2 different ML models

The AdaBoost Classifier and Logistic Regression returned similar results and it is difficult to determine which ML model will be more accurate

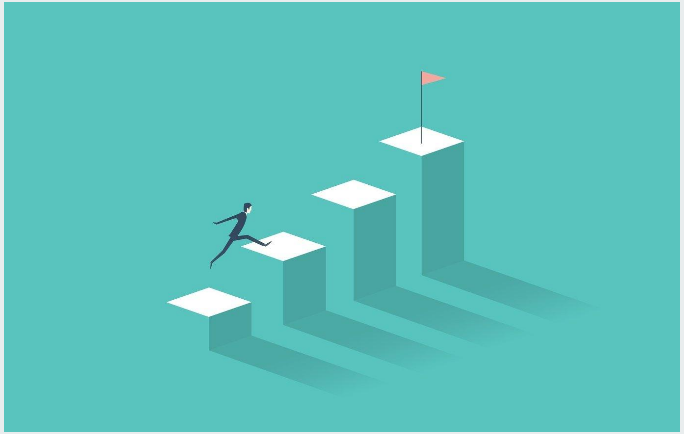
Final step: created a pattern of buys/sells based on the signals we created (+/-1). Will help the user forecast and learn when to buy and sell

Unanticipated Issues/Insights

1. Questionnaire would not run in Google Colab
    a. Integrating the user's input with our machine learning models has proven to be difficult
    b. Used a Google Colab form to select the user's stock choice in the interim, but would like to build out the full questionnaire so that it is fully integrated
2. Wanted to include more NFT's, but data is limited
3. Ran out of time and was not able to include our timeframe piece



Next Steps



Chat Bot

Set up a chat bot that will give the user updates about the stock they have previously analyzed

Enhance predictive capabilities of our models

Classification reports could be stronger

Data Sources / Repo

https://github.com/anthonybarone0211/project2

https://pypi.org/project/questionary/

https://finance.yahoo.com/

https://technical-analysis-library-in-python.readthedocs.io/en/latest/ta.html

Questions?