For our project we created an interactive interface for ARK funds, that allows users to view historical performance for each ETF, performance of individual stocks within an ETF, and provide investment advice for users that want to use these funds as a reference. ARK Investment Management is an investment management firm that manages 9 actively traded ETFs, ranging from funds focused on growth tech companies such as Nvidia, Roblox and Tesla, to regionally based funds like IZRL which focuses on companies based in Isreal. Cathie Wood is the CEO of ARK and is often outspoken about the companies in ARK’s portfolio. ETFs’ current holdings are available on ARK’s website, published as .csv files, which are updated daily for trading. These files include the fund name, company holdings, ticker symbols, current number of held shares, holding weight (% of fund portfolio), and market value (holdings multiplied by closing price).

Since the ARK Invest webpage only contains .csv files for the current day’s holdings, and does not provide a database for each funds’ previous holding profile, our group developed a python script to scrape the website for .csv files and then compile the files downloaded over separate days into a single database file. This program works by accessing the webpage’s URL that contains the .csv files, searching for specific file names, and downloading each file that matches one of the names in the list. These files are then compiled into a common file called ARK\_database, which allows cross-referencing each fund’s holding changes over the days for which the fund’s profiles were downloaded. This is the backbone of our application that allows users to view ARK’s day-to-day trading activity. For example, users can see what stocks ARKW (a specific ARK ETF) was buying and selling between 3/11/25 and 3/14/25, and see that this ETF sold 1,248 shares of Spotify (SPOT) over this period, which accounted for 2.49% of its SPOT holdings. In addition to viewing performance of aggregate funds, the application also allows users to trend performance of individual stocks for specified periods. Users can use this information to compare how ARK funds’ holdings are changing over time relative to the performance of stocks in the ETF portfolio. This could give users insight on whether they align with ARK’s investment strategies.

The original application required users to manually run a python script, open the created excel sheet, and navigate between pop-up graphical windows to evaluate these ETF and stock performance trends. This activity was clumsy, clunky, and cumbersome. To eliminate this back and forth manual interaction, we utilized a python library called Streamlit to create an interactive application. Streamlit offers a variety of tools for developers to present data and have users easily interact with it. Users can filter data, toggle to different views and graphs, and gain additional insights that would be more laborious if you tried to do this in a data frame.

One key area of focus was to present a breakdown of all stock holdings in a fund. In the application, users select a fund from a dropdown menu which shows the stocks that make up that fund, the percentage of the fund each one makes up, and it gives a snapshot of the fund’s performance over the last month. Streamlit supports an array of charts and charting libraries, which we used to produce graphs, such as the pie graph showing the selected fund’s holdings profile and the line graph for fund performance. The use of Streamlit’s “tab” function, enables users to quickly click through different formats of the data that output on the various tabs.

Most of the ARK funds are made up of many stocks. For example, ARKF has 36 actively traded stocks, but not all stocks are equally weighted. SHOP makes up 9.75% of the funds weight by market cap, while AVDX is just 0.71%. A large price swing in SHOP has a much greater impact when compared to AVDX on fund performance. Users would likely want to see a snapshot of the funds that make up the bulk of the portfolio, without seeing the entire fund listing. To accommodate this, the application filters the selected fund by the top 10 stocks, and then provides performance history for those stocks. Users can again select other tabs to get more detailed tabular information, including per-share returns, percent change, and volatility. The application utilizes the Yfinance library to import individual stocks at historical prices to generate this information.

When deciding whether to invest in one of ARK’s ETFs, users should consider how ARK has managed the funds’ portfolios based on changes in the market. Our application allows users to select a fund and a date range (start and end date) and the user will be shown an output of how the fund’s holdings have changed between those dates, displaying a bar chart with each stock’s share volume change. This shows how ARK has bought and sold shares. Users can also toggle between viewing change in shares and change in market cap for the selected fund. Being able to see the change from date to date in market capitalization and number of shares can help users see the historic motion of travel for the individual stocks that make up the fund.

The goal of this application is to provide the user with a framework for making an investment decision. Users can select a fund and receive advice on whether to invest in the given fund. This simply compares the fund to the S&P 500 performance over the same time period and evaluates whether the ETF outperformed the S&P 500. This gives a better reference than simply looking at positive or negative growth, since the S&P 500 is used as a market performance indicator. The application also provides information on aggregate fund volatility and will notify the user if the fund has higher volatility than the S&P 500, indicating a riskier investment. This can also be used to assess individual stocks within a fund.

The interactive dashboard is designed to be versatile and empower users to gain insight on the ARK funds through various metrics. This Streamlit application provides users with an intuitive and interactive dashboard analyze fund performance relative to the market. We hope that this application makes it easier for someone to evaluate ARK ETFs and make a sound investment decision.