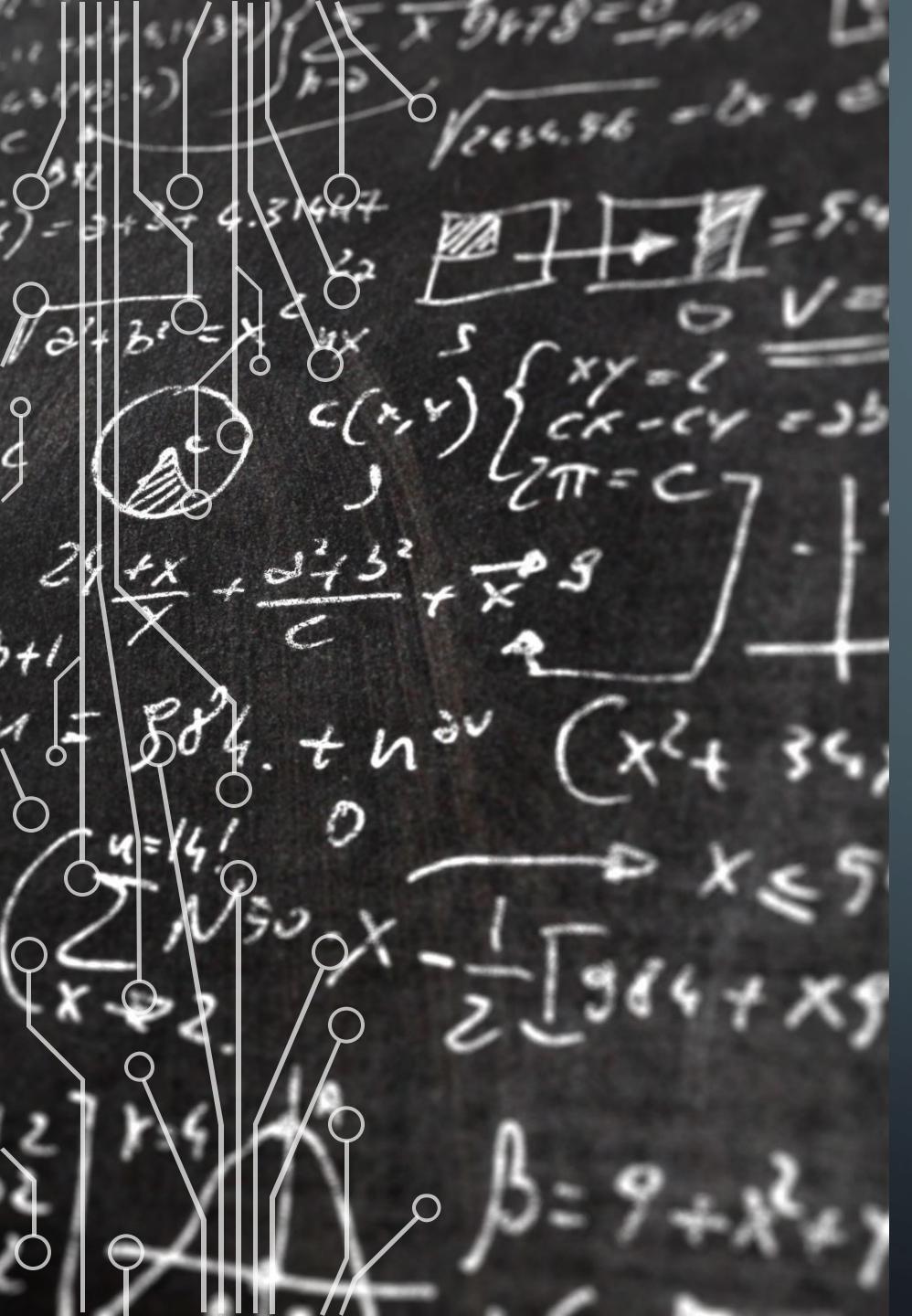


# CRYPTOCURRENCY PORTFOLIO DASHBOARD

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# AGENDA

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1. Project Objectives
2. Cryptocurrency History
3. Data Extraction (API)
4. Data Manipulation & Cleanup
5. Analysis & Outcomes
6. Packages Used

## PROJECT OBJECTIVES

- Use APIs to extract current & historical cryptocurrency prices as well as cryptocurrency market capitalization data
- Use Python, Pandas, NumPy, HvPlot, & Panel to analyze API data
- Create custom portfolio of Altcoins (non-BTC) and analyze past and future performance through visualizations and Monte Carlo simulations
- Create custom dashboard to display crypto portfolio & analysis results



# CRYPTOCURRENCY HISTORY



## WHAT IS CRYPTOCURRENCY?

- A digital currency in which transactions are verified and records maintained by a decentralized system using cryptography, rather than by a centralized authority

## INITIAL CREATION & FAILURE:

- First hypothesized in the late 1980s & early 1990s
- Initial examples include DigiCash and eCash

## SUCCESS:

- Liftoff of Bitcoin and Ethereum in 2010s
- Decentralized, private, and encrypted

## EVOLUTION:

- Coins being used in marketplace transactions
- Creation of smart contracts

# DATA EXTRACTION (API)



## FREE CRYPTO API:

- Used the free crypto API to extract current market capitalization data for top 50 cryptocurrencies
- <https://api.alternative.me/v2/ticker/>

## CCXT LIBRARY:

- CryptoCurrency eXchange Trading library
- The CCXT library is used to connect and trade with cryptocurrency exchanges and payment processing services worldwide.
- It provides quick access to market data for storage, analysis, visualizations and algorithmic trading.

## MEXC GLOBAL API:

- Used the MEXC Global exchange API to extract Open, High, Low, Close, Volume (OHLCV) historical crypto data for the last 1,000 days.
- <https://mxcdevelop.github.io/APIDoc>



# DATA MANIPULATION & CLEANUP



## TOP 50 CRYPTOS BY MARKET CAP:

- Used for loops to loop through free crypto API dictionary and list to extract crypto keys and current market capitalizations
- Used nlargest Pandas functions to select list of top 50 cryptos by current market capitalization

## OHLCV HISTORICAL DATA:

- Used for loop to loop through list of top 50 cryptocurrencies and extract OHLCV data using CCXT & MEXC
- Used try & except to determine base currency denomination (i.e., USDT, USDC, UST) for each cryptocurrency
- Used TQDM function to show a progress bar loading crypto data
- Appended crypto price data to a list and then converted into Pandas dataframe

## CUSTOM ALTCOIN PORTFOLIO:

- Created custom portfolio of altcoins selecting 6 of the top 50 cryptocurrencies (non-bitcoin)
- Established variables for initial total investment, portfolio weights, & number of days invested
- Created function to determine the units invested in each crypto as of the initial investment date
- Created custom Pandas dataframes of portfolio data to use for interactive charts, plots, and Monte Carlo simulations

# ANALYSIS & OUTCOMES



## HVPLOT & HOLOVIEW VISUALIZATIONS:

- Annual (2021) price chart for each crypto (with widget)
- One-year daily returns (%) by crypto (all coins & widget)
- One-year cumulative returns (%) by crypto (all coins & widget)
- One-year portfolio value (USD) by crypto (all coins & widget)
- One-year portfolio value (USD) in total

## MONTE CARLO SIMULATION:

- Monte Carlo simulation using while & for loops and NumPy
- 100 simulations for 365-days based on last 100 days of prices
- Visualizations:
  - Chart of all 100 simulations over 365 days
  - Histogram with frequency of potential outcomes
  - Custom view to view 10 simulations at a time

## ALTCOIN PORTFOLIO DASHBOARD:

- Used Panel (Row, Column, & Tabs) to create custom altcoin portfolio dashboard
- Use terminal function to launch servable dashboard in new web browser
  - **Script:** panel serve Project\_1\_Code\_12222021.ipynb --log-level debug --show

A blurred screenshot of a crypto portfolio dashboard. It features several orange bars representing different cryptocurrencies. The top bar has a value of "183.102". A blue arrow points to the second bar from the top, which has a value of "154.178".

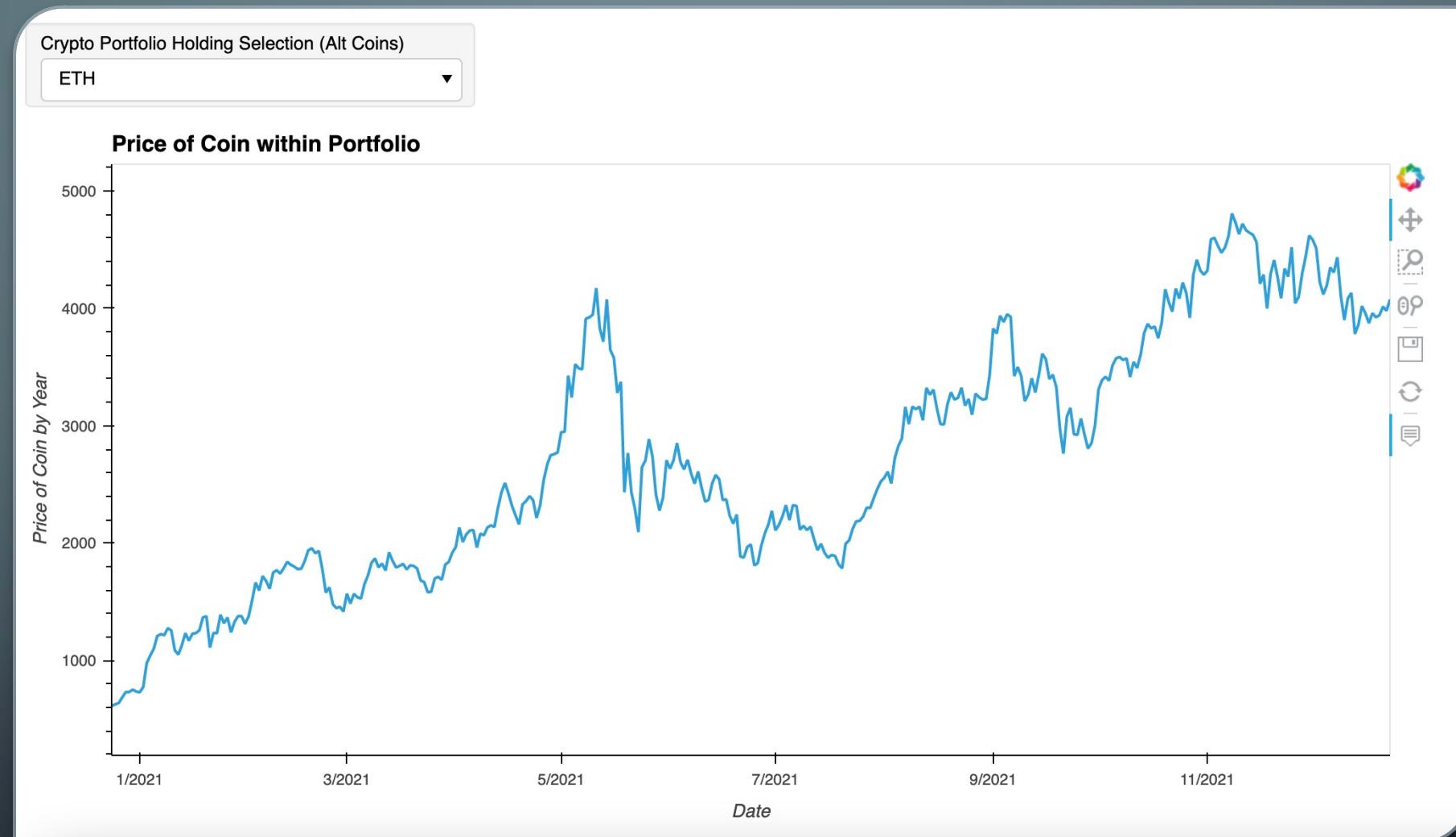
# ALTCOIN PORTFOLIO DASHBOARD SCREENSHOTS

# Altcoin Portfolio Selections & Investment

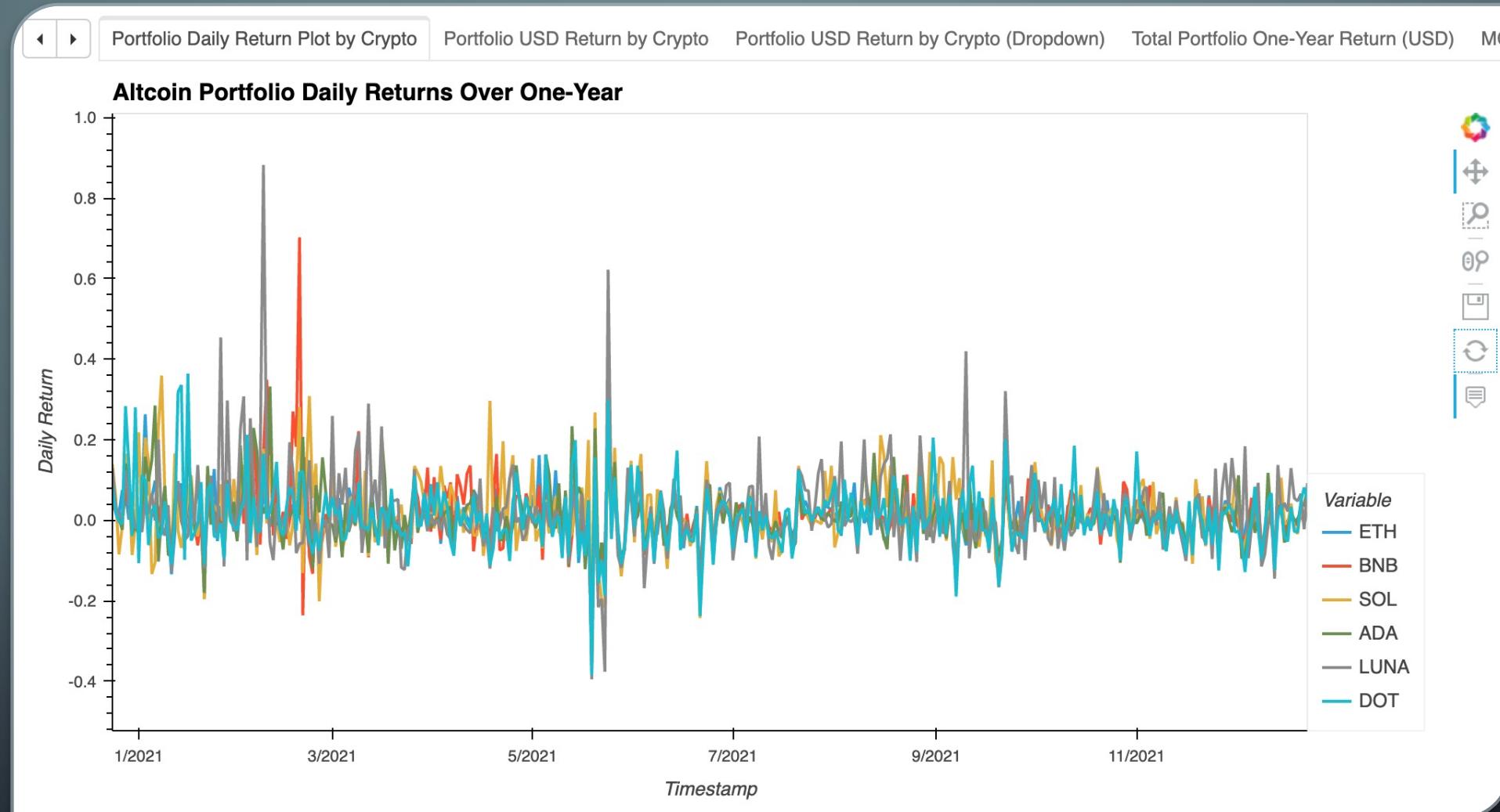
## Portfolio of Altcoins: \$1000 Invested As of One Year Ago Today

Cryptocurrency	Description	Initial Percent of Portfolio	Initial Units Purchased	Initial USD Amount Purchased
ETH	Ethereum	0.2	0.326675	200.0
BNB	Binance Coin	0.1	3.077027	100.0
SOL	Solana	0.1	73.233248	100.0
ADA	Cardano	0.3	1960.335871	300.0
LUNA	Terra	0.1	192.901235	100.0
DOT	Polkadot	0.2	39.062500	200.0

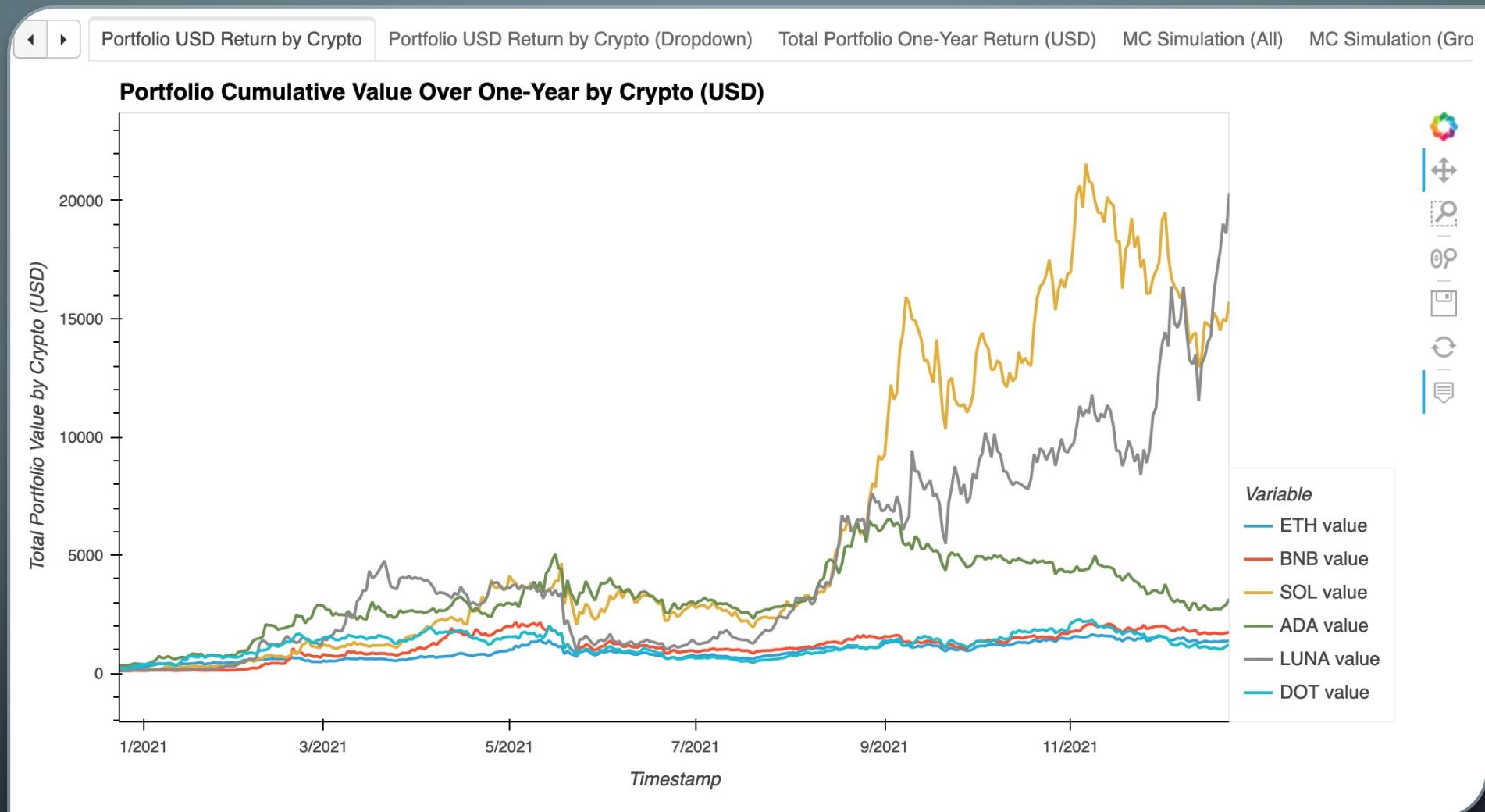
# Annual 2021 Price Chart by Portfolio Holding



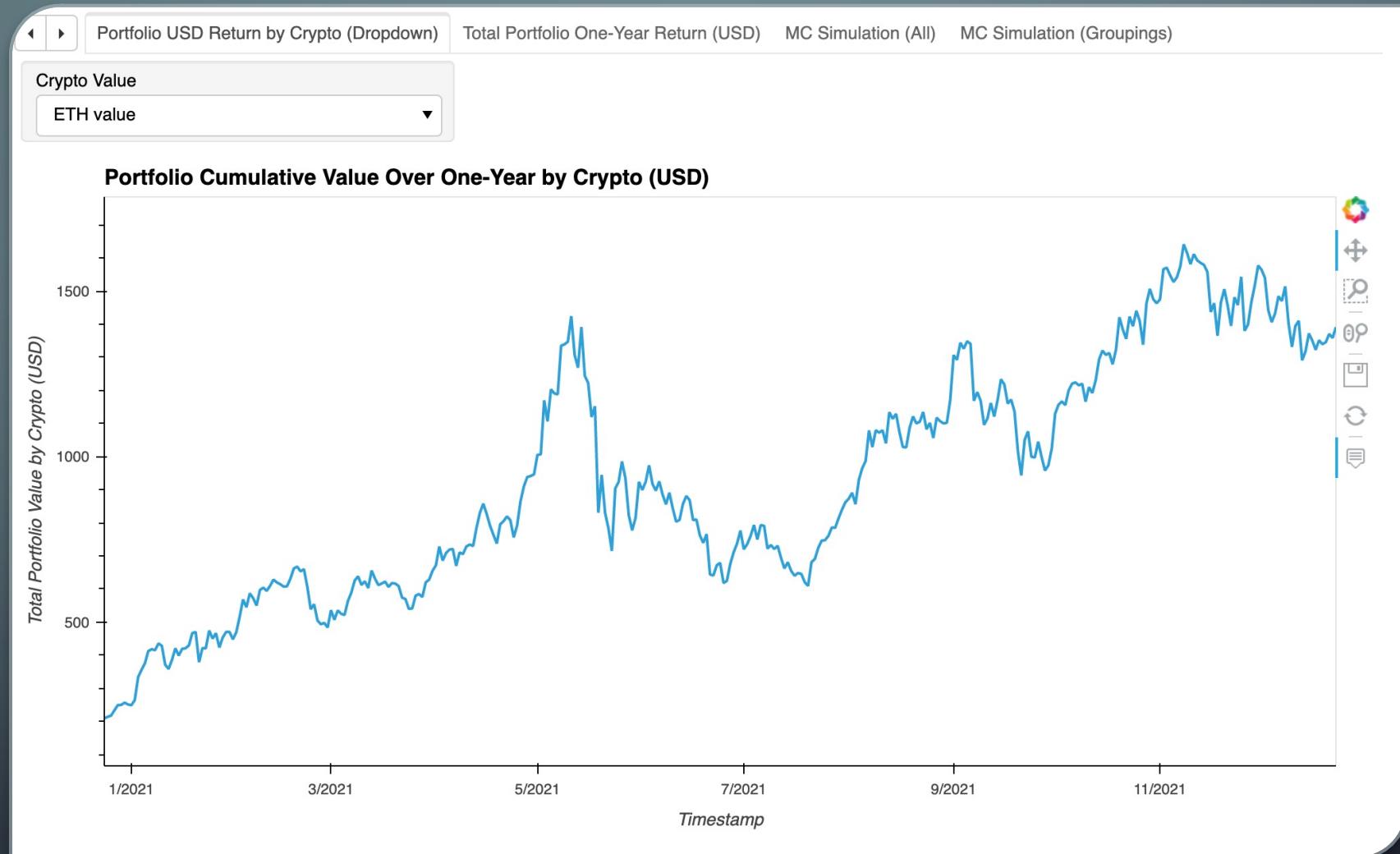
# 2021 Portfolio Daily Returns by Holding



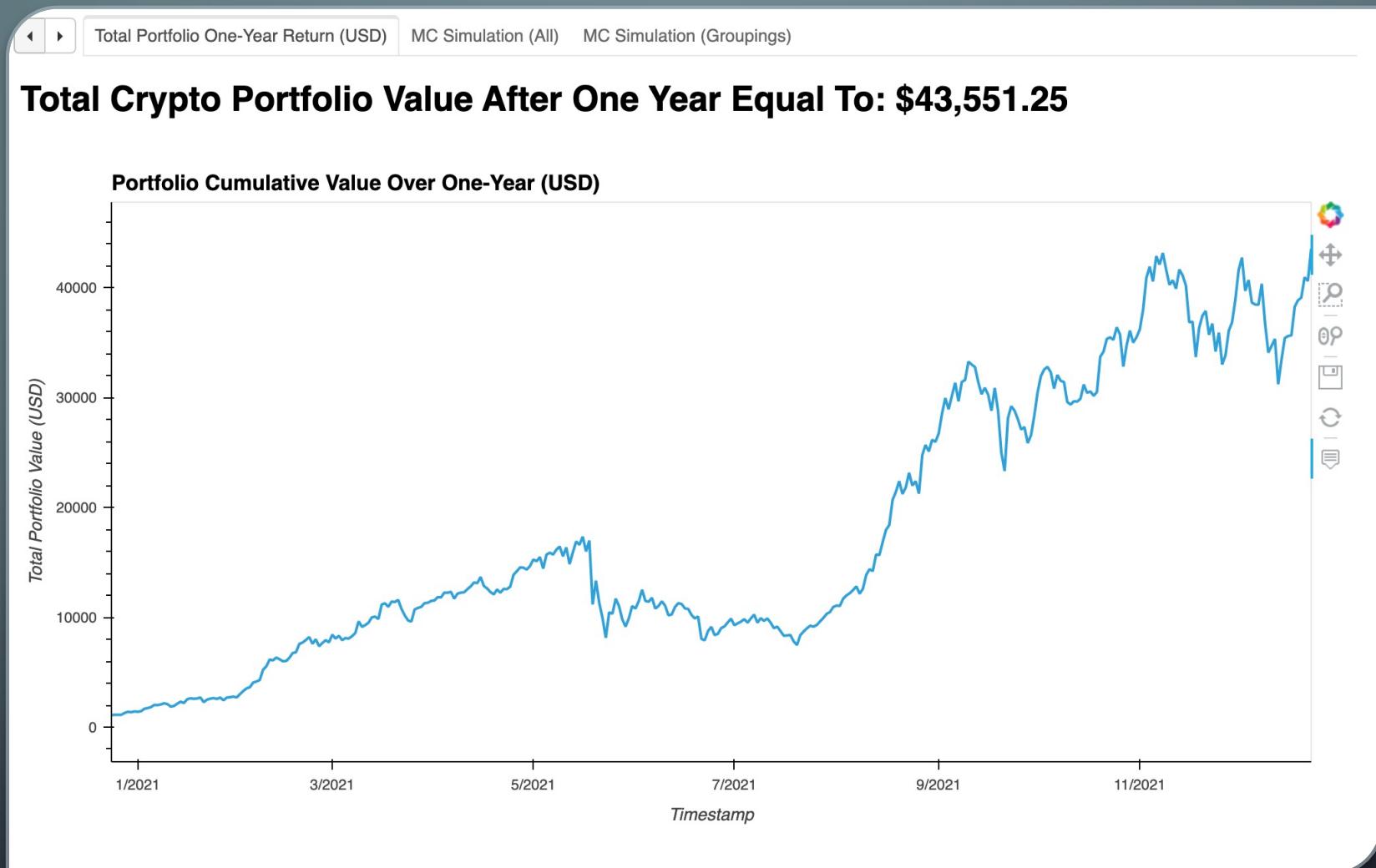
# 2021 Portfolio Returns (USD) by Holding



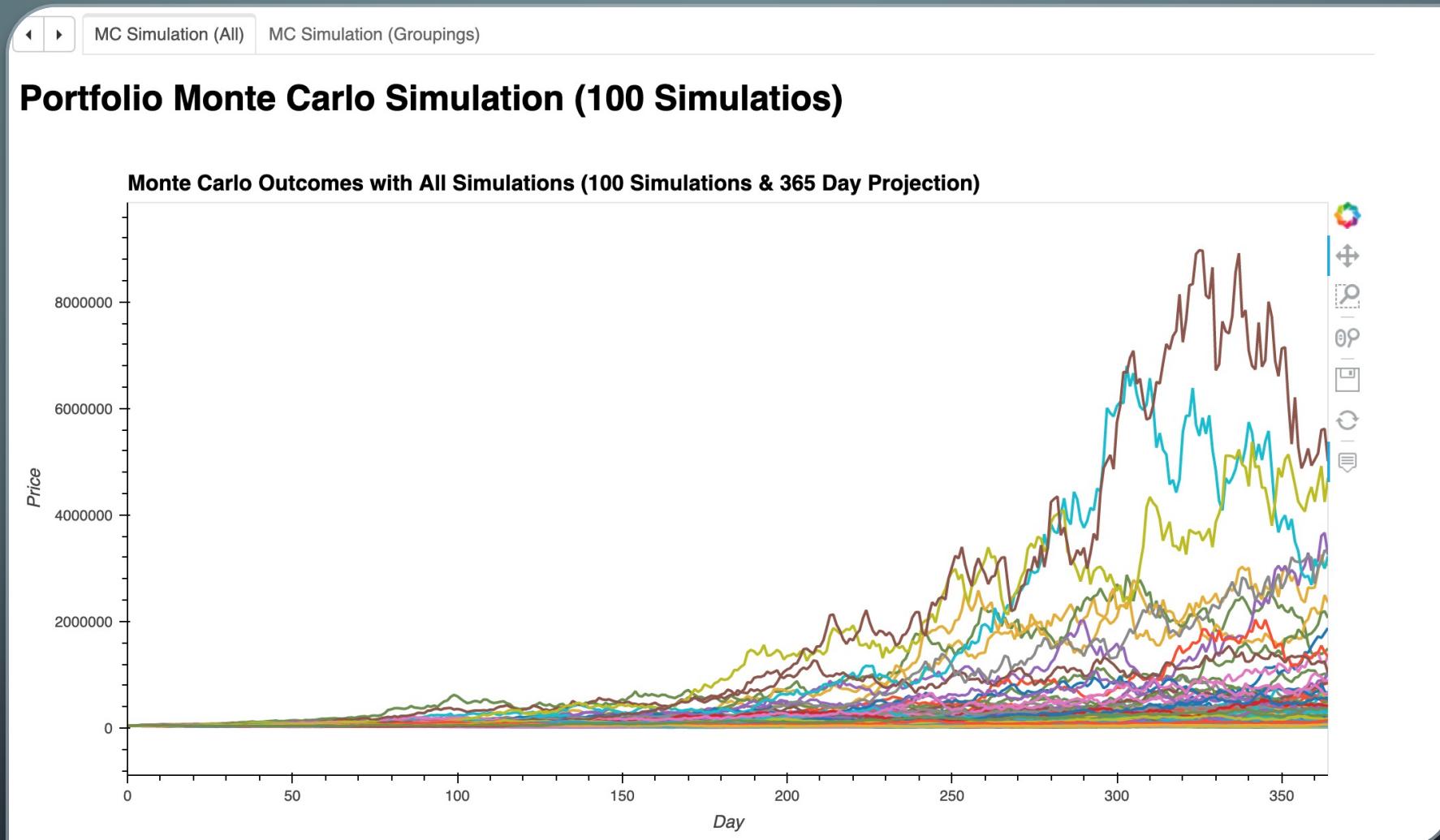
# 2021 Portfolio Returns (USD) by Holding (Dropdown)



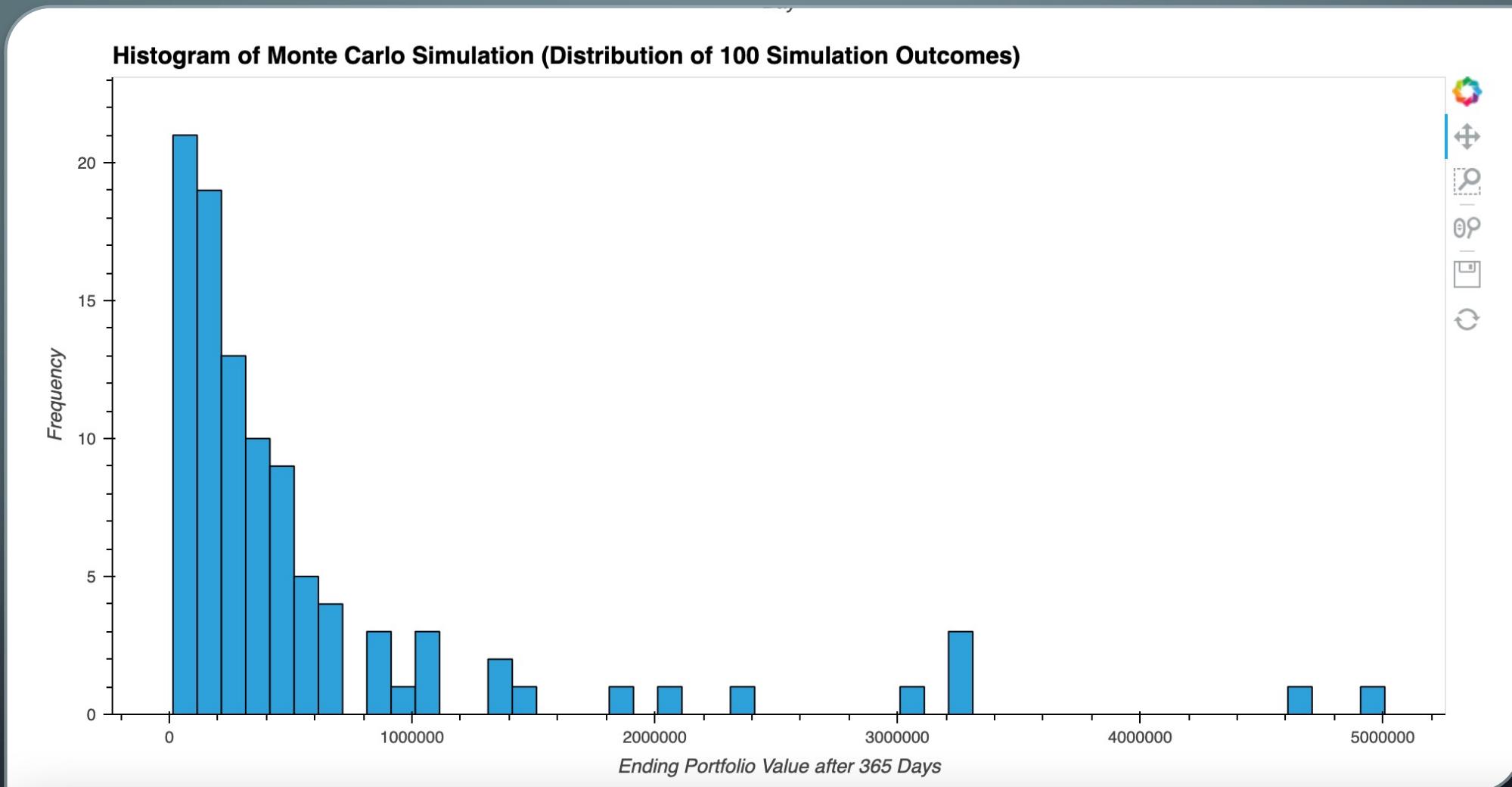
# 2021 Portfolio Returns (USD) in Total



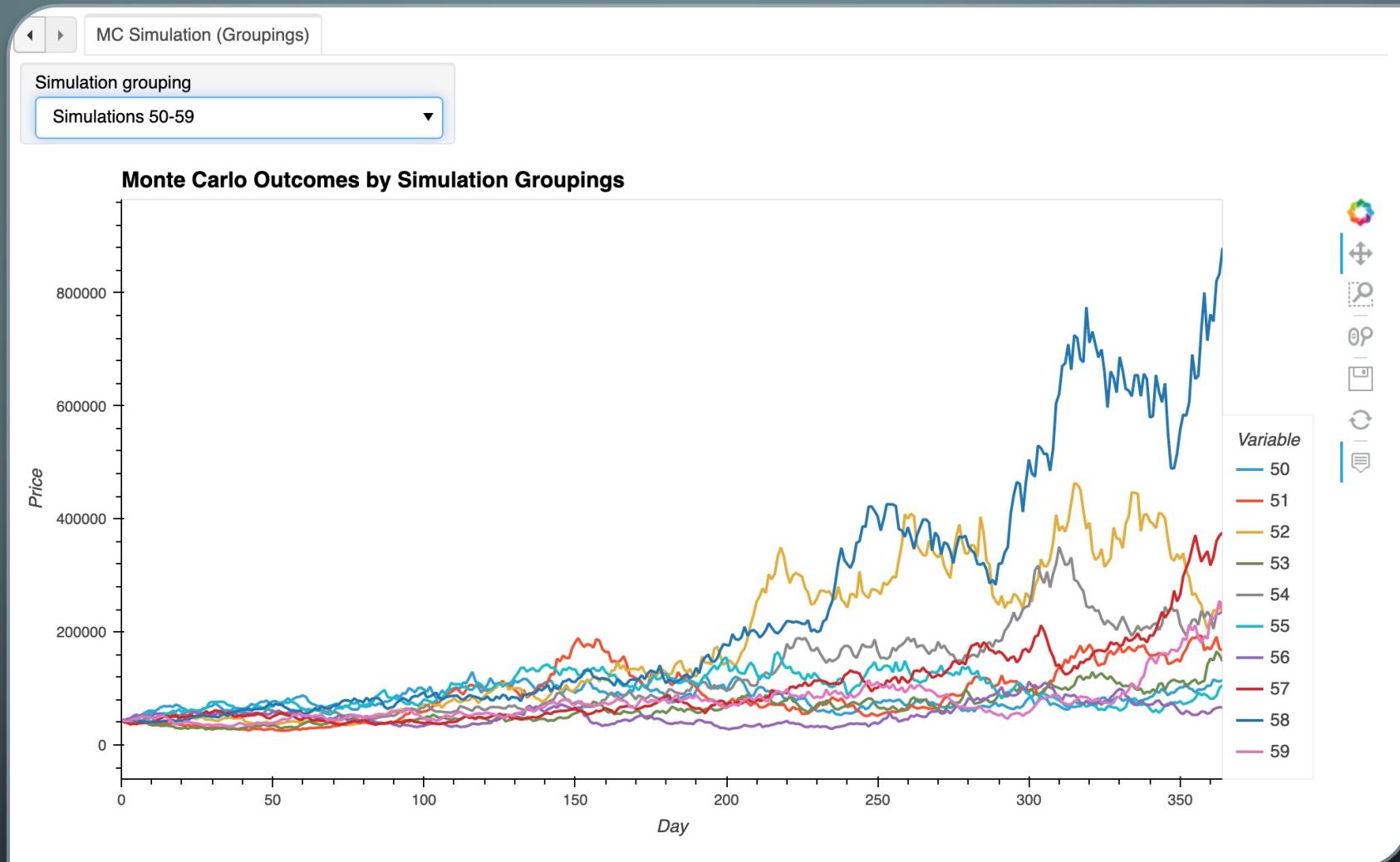
# Monte Carlo Simulation (100 Simulations)



# Histogram of Projected Values from MC Simulation



# Custom Dropdown to View 10 Simulations at Once



Data & Calculations	APIs	Python Packages
1. Market Capitalization	Free Crypto	Python, Pandas, Requests, json
2. OHLCV Historical Prices	CCXT (MEXC)	Python, Pandas, Datetime, tqdm
3. Performance Analysis	N/A	NumPy, Pandas, hvPlot
4. Monte Carlo Simulation	N/A	NumPy & Pandas, hvPlot, HoloViews
5. Portfolio Dashboard	N/A	Panel