

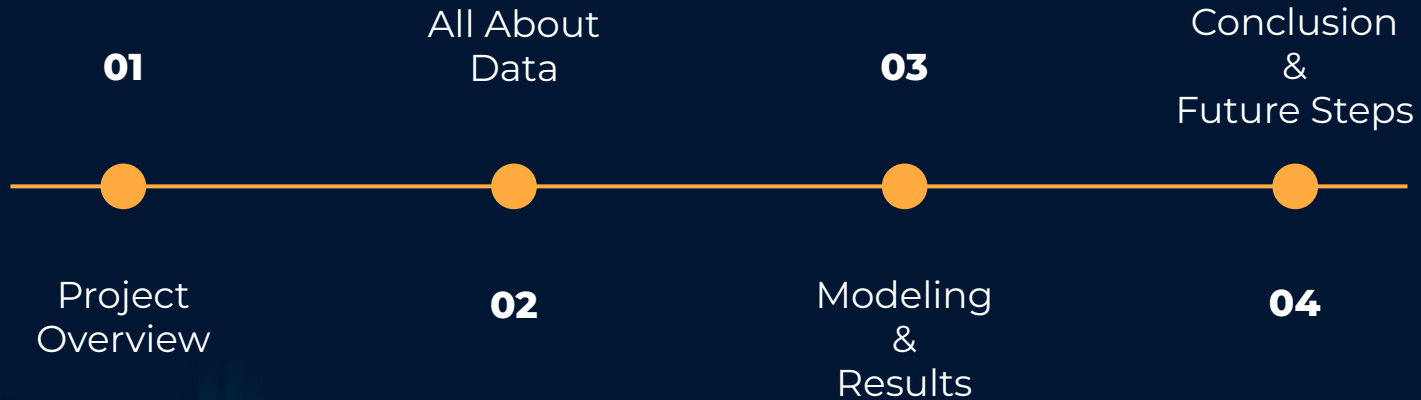


Stock Market Price Trend Prediction

Using Time Series Forecasting

Santi Swain

CONTENTS





01 | PROJECT OVERVIEW

PROBLEM STATEMENT

How can we use time series forecasting to **predict future stock prices** and support a more **informed decision making**?



“Waiting helps you as an investor and a lot of people just can’t stand to wait. If you didn’t get the deferred-gratification gene, you’ve got to work very hard to overcome that.”

— Charlie Munger





02 | ALL ABOUT DATA



SOURCE



SPDR S&P 500 ETF Trust (SPY)

NYSEArca - Nasdaq Real Time Price. Currency in USD



KEY FEATURES

- Date
- Open
- Low
- Close
- Adj Close
- Volume



TIMESPAN

JAN 29, 1993

-

OCT 11, 2023

PRE-PROCESSING



Cleaning

0 Duplicates!



'Date' Format

`Date(str)`

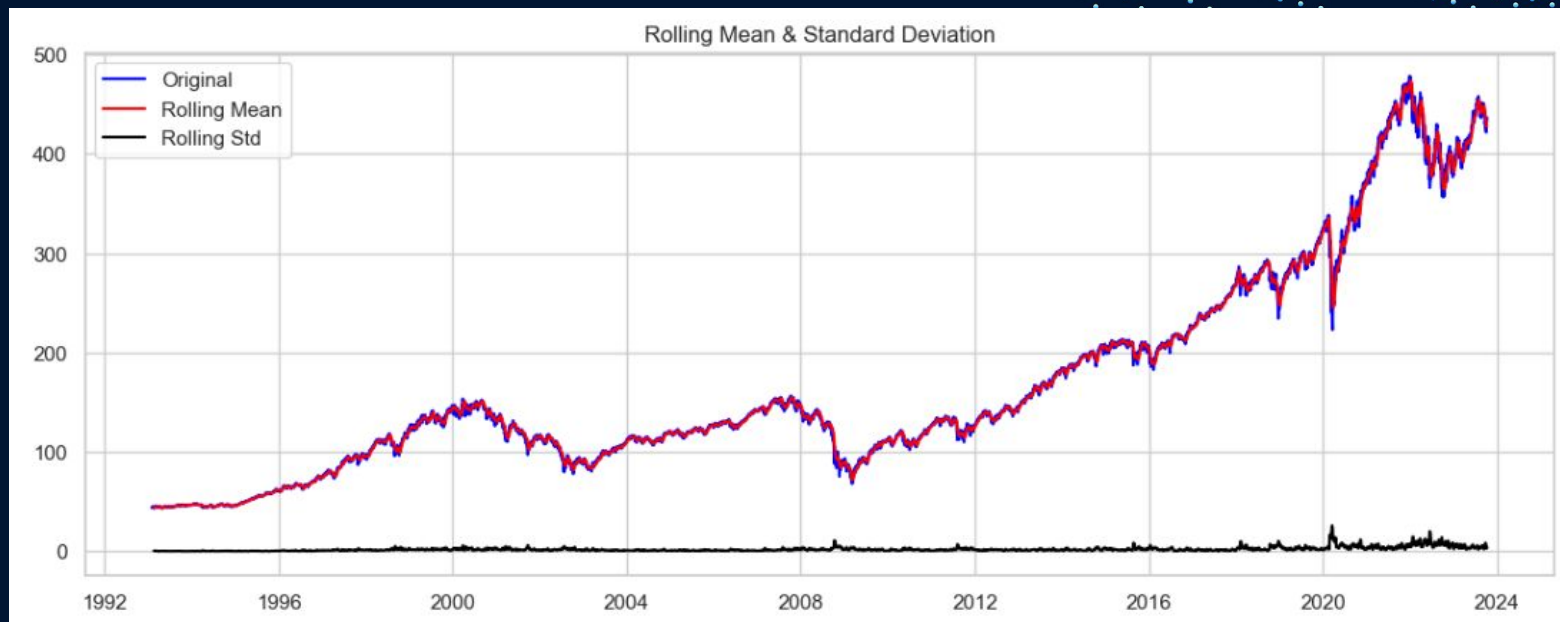


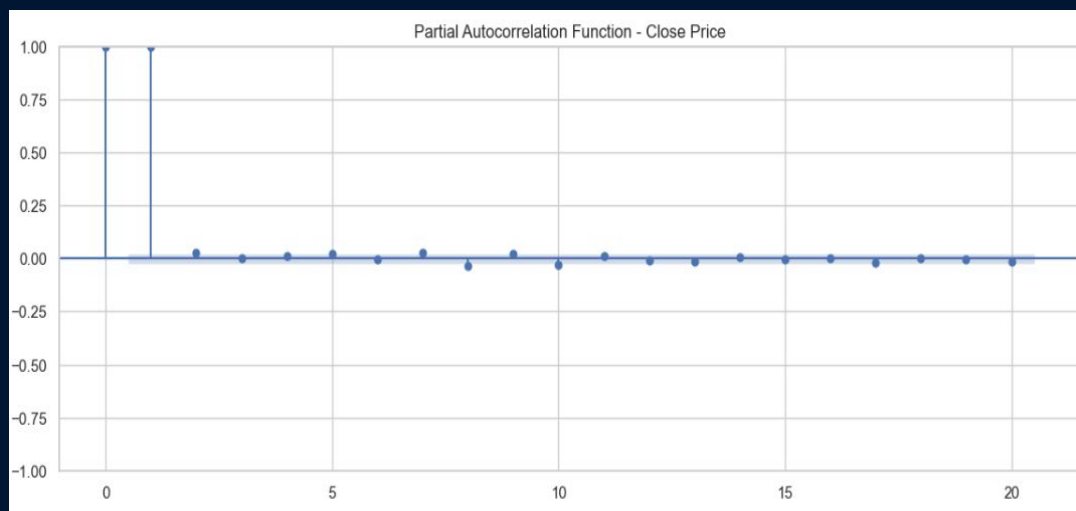
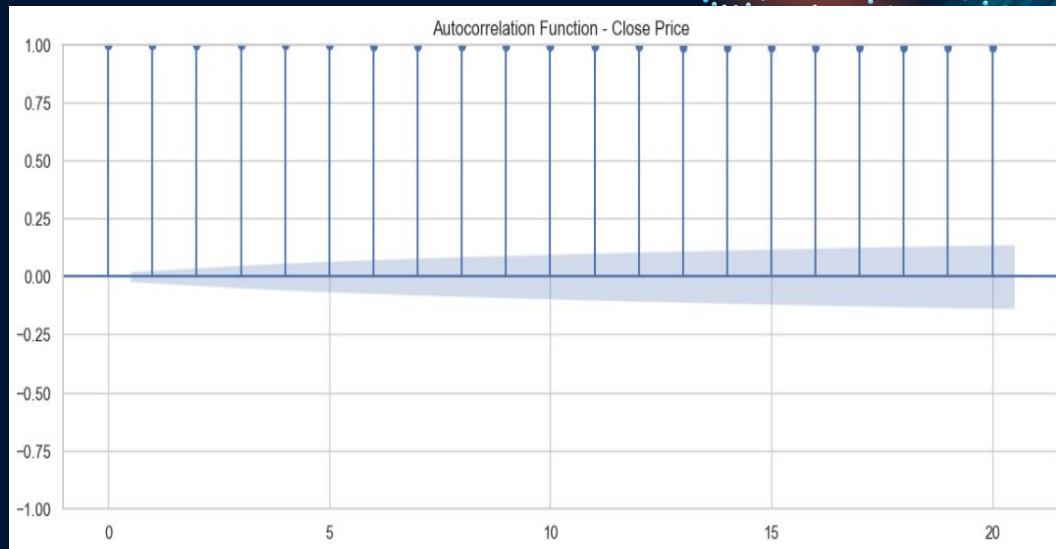
`datetime`



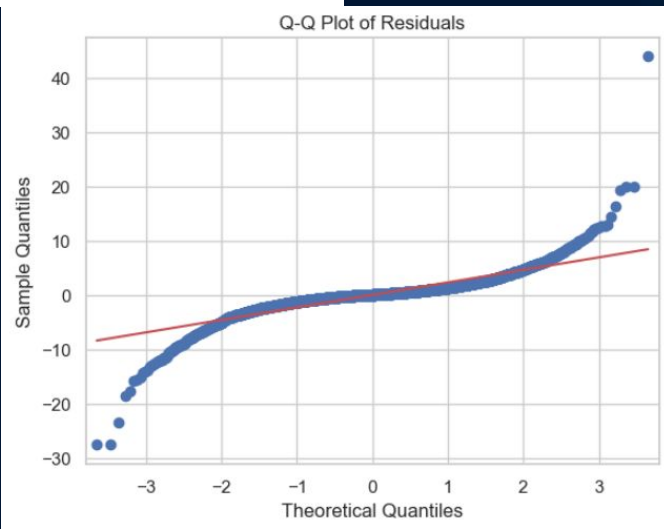
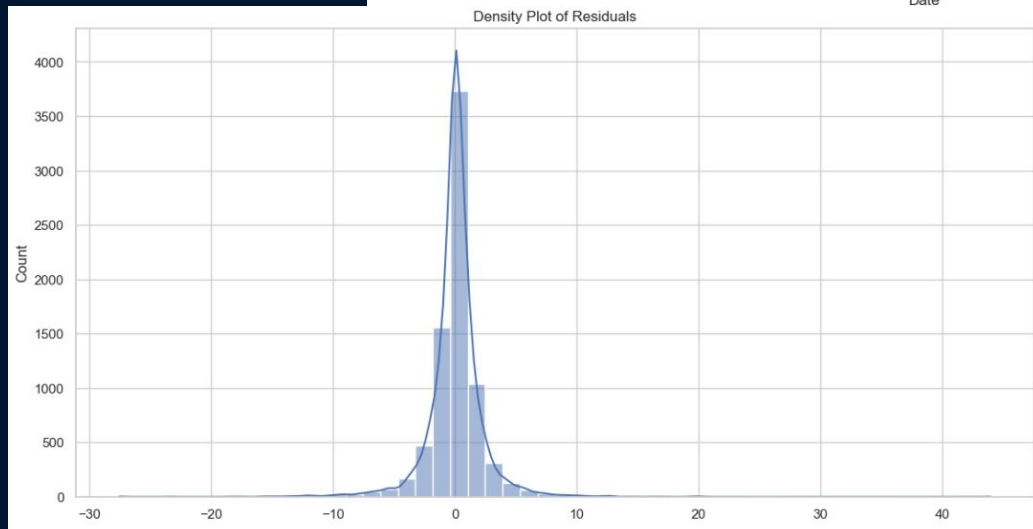
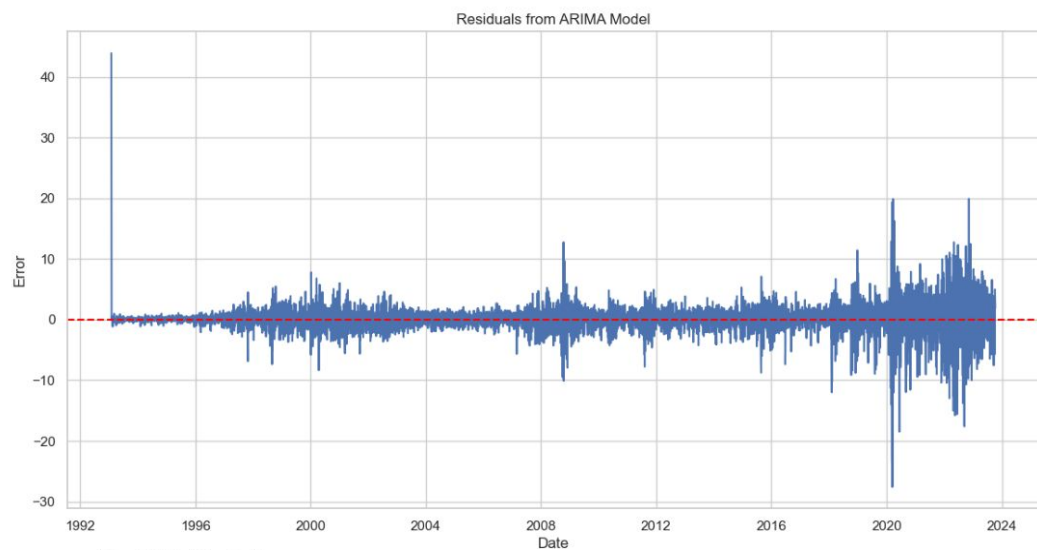
'Date' index

Setting the 'Date' column as the index of the DataFrame to facilitate time series analysis.





Dep. Variable:	Close	No. Observations:	7731			
Model:	ARIMA(1, 1, 1)	Log Likelihood	-17223.575			
Date:	Fri, 10 Nov 2023	AIC	34453.151			
Time:	00:07:44	BIC	34474.009			
Sample:	0	HQIC	34460.303			
	- 7731					
Covariance Type:	opg					
	coef	std err	z	P> z	[0.025	0.975]
ar.L1	-0.2319	0.044	-5.216	0.000	-0.319	-0.145
ma.L1	0.1548	0.046	3.375	0.001	0.065	0.245
sigma2	5.0451	0.027	190.198	0.000	4.993	5.097
Ljung-Box (L1) (Q):	0.00	Jarque-Bera (JB):	100791.00			
Prob(Q):	0.97	Prob(JB):	0.00			
Heteroskedasticity (H):	7.23	Skew:	-0.83			
Prob(H) (two-sided):	0.00	Kurtosis:	20.61			



RESULTS VS REAL TIME

	MODELING	REALTIME	% DIFFERENCE
DAY 1	\$ 436.08	\$433.66	0.56%
DAY 2	\$ 436.02	\$431.50	1.05%
DAY 3	\$ 436.01	\$436.04	0.01%
DAY 4	\$ 436	\$436.02	0.01%
DAY 5	\$ 436	\$430.21	1.35%

KEY FINDINGS

01

Characteristics typical of financial time series.

02

The ARIMA model was capable of capturing the time series dynamics.

03

Log transformation helped to stabilize variance.

04

Forecasting model suggested a relatively stable price trend for the upcoming days.

NEXT STEPS

01



ADVANCED MODELS

02

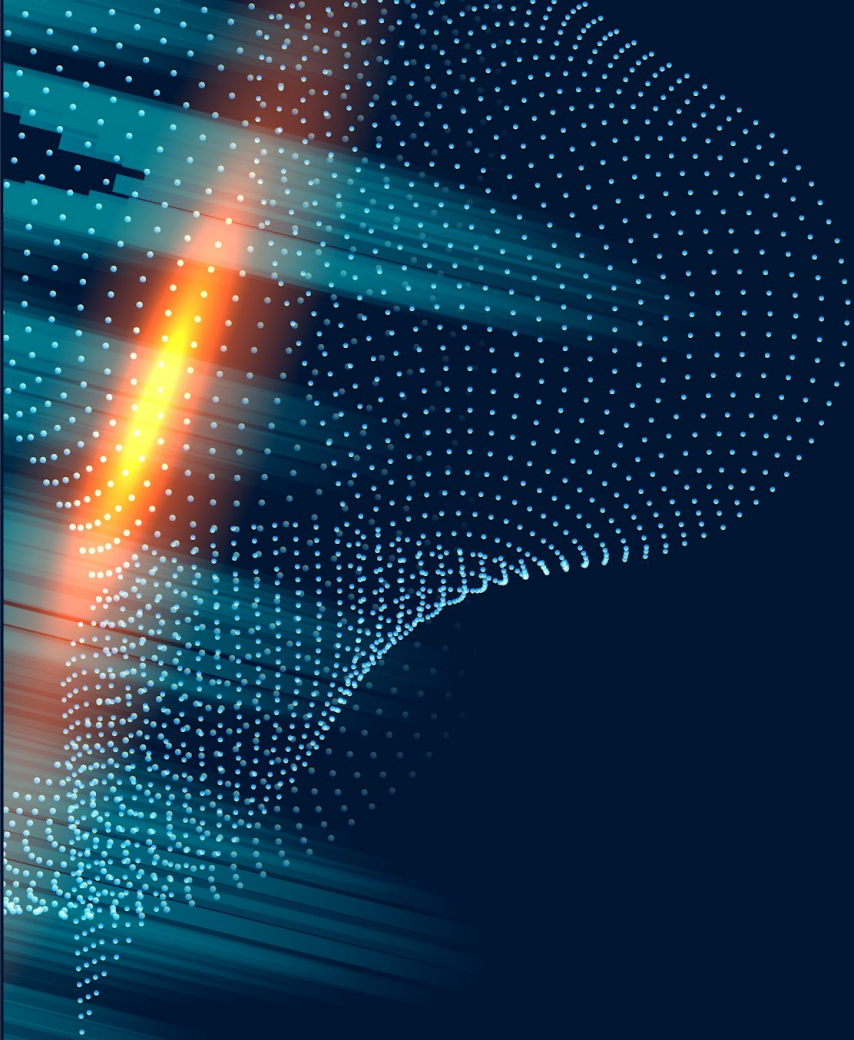


RISK ANALYSIS

03



DEPLOYMENT AND MONITORING



THANK
YOU.