

# TIME SERIES ANALYSIS OF NIFTY 50 STOCK

LETS DIVE INTO  
THE WORLD OF  
STOCK ANALYSIS



# DEHRADUN CARTEL

"The Four Most Dangerous Words in Investing Are: 'THIS TIME IT'S DIFFERENT.'" - Sir John Templeton



NINAD GANGODKAR



KHUSHI KHATTAR



# INTRODUCTION

TIME SERIES ANALYSIS IS A STATISTICAL TECHNIQUE THAT DEALS WITH TIME SERIES DATA, OR TREND ANALYSIS. TIME SERIES DATA MEANS THAT DATA IS IN A SERIES OF PARTICULAR TIME PERIODS OR INTERVALS. INCORPORATING TIME SERIES ANALYSIS INTO OUR MACHINE LEARNING PROJECT, WE EXPLORE PATTERNS AND TRENDS OVER TIME TO MAKE PREDICTIONS. BY LEVERAGING HISTORICAL DATA, OUR MODEL AIMS TO UNCOVER INSIGHTS CRUCIAL FOR FORECASTING FUTURE OUTCOMES, ENABLING DATA-DRIVEN DECISION-MAKING IN DIVERSE FIELDS SUCH AS FINANCE, HEALTHCARE, AND ENVIRONMENTAL MONITORING.

## TREND COMPONENT

THIS IS A VARIATION THAT MOVES UP OR DOWN IN A REASONABLY PREDICTABLE PATTERN OVER A LONG PERIOD.

## SEASONALITY COMPONENT

THIS IS THE VARIATION THAT IS REGULAR AND PERIODIC AND REPEATS ITSELF OVER A SPECIFIC PERIOD SUCH AS A DAY, WEEK, MONTH, SEASON, ETC.,

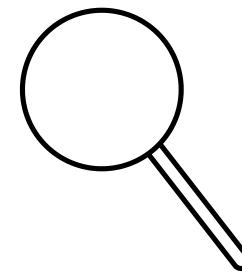
## CYCCLICAL COMPONENT

THIS IS THE VARIATION THAT CORRESPONDS WITH BUSINESS OR ECONOMIC 'BOOM-BUST' CYCLES OR FOLLOWS THEIR OWN PECULIAR CYCLES

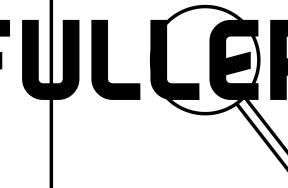
## RANDOM COMPONENT

THIS IS THE VARIATION THAT IS ERRATIC OR RESIDUAL AND DOES NOT FALL UNDER ANY OF THE ABOVE THREE CLASSIFICATIONS.

# ALGORITHM AND TECHNIQUES USED

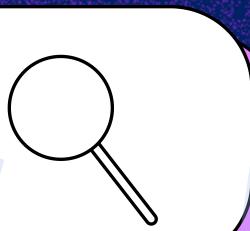


## AUGMENTED DICKEY FULLER



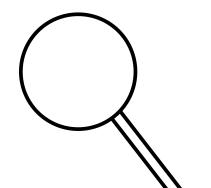
THIS TEST IS A TYPE OF STATISTICAL TEST CALLED A UNIT ROOT TESTING.

## AUTOCORRELATION AND PARTIAL AUTOCORRELATION



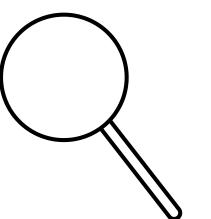
AUTO-CORRELATION FUNCTION GIVES US VALUES OF AUTO-CORRELATION OF ANY SERIES WITH ITS LAGGED VALUES.

## MOVING AVERAGE



IT IS A SIMPLE TECHNICAL ANALYSIS TOOL THAT SMOOTHES OUT PRICE DATA BY CREATING A CONSTANTLY UPDATED AVERAGE PRICE

## AUTO ARIMA-AUTOREGRESSIVE INTEGRATED MOVING AVERAGE



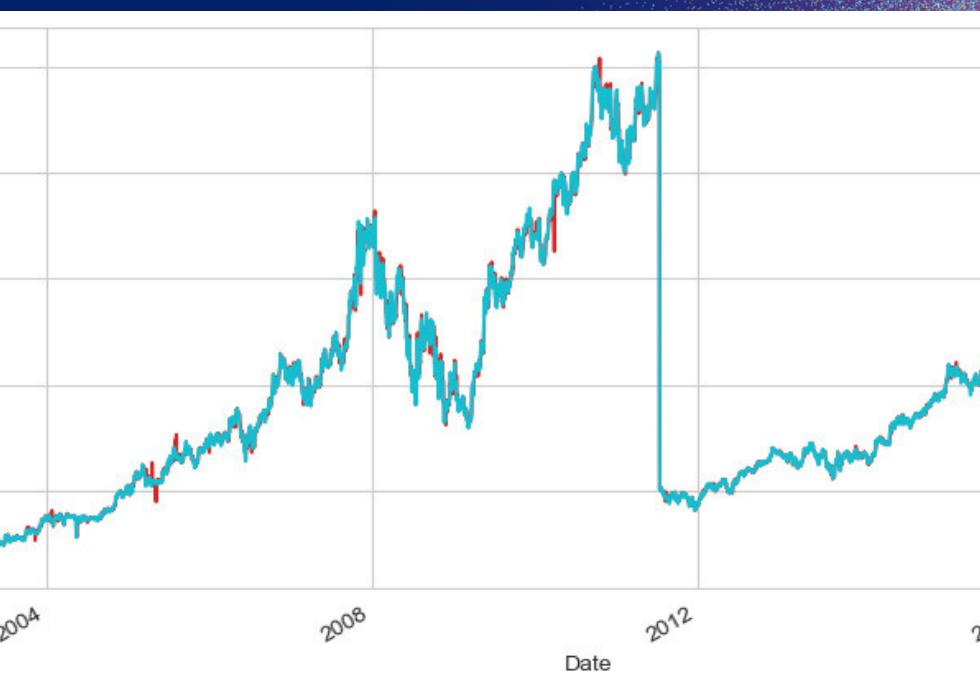
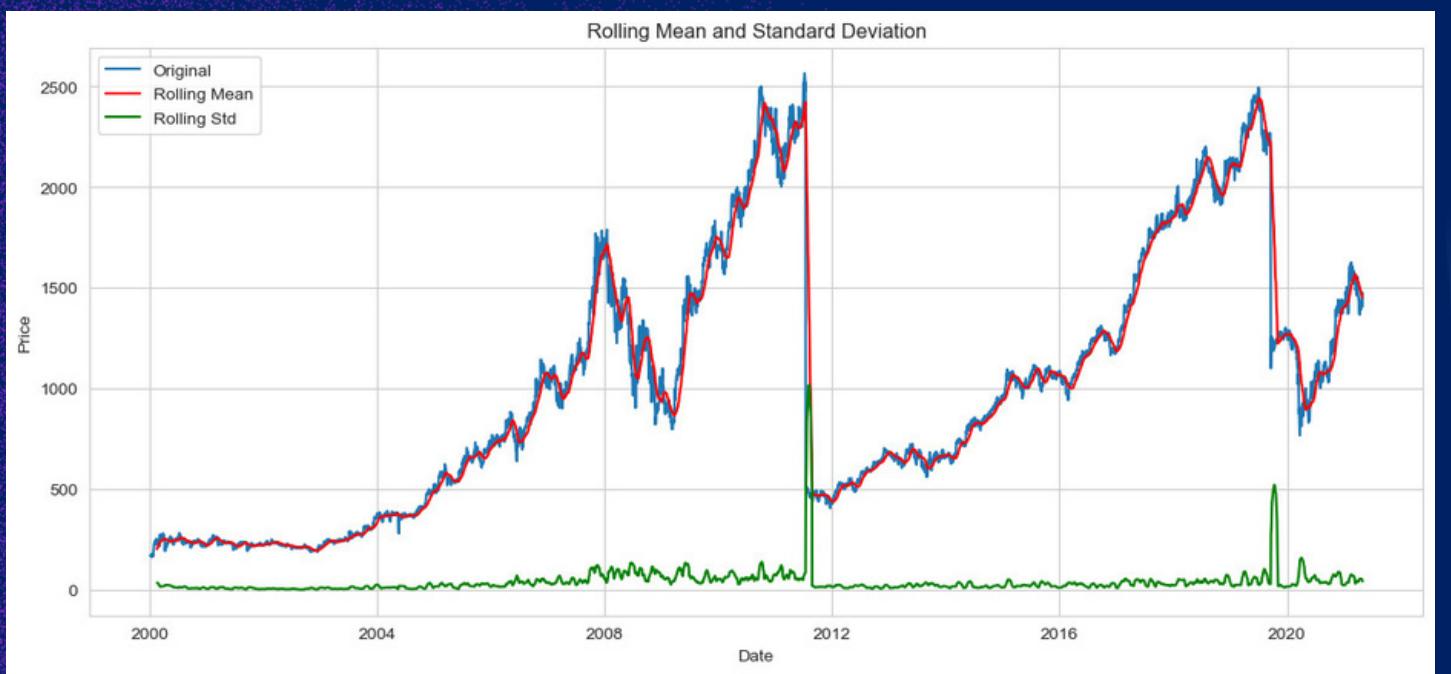
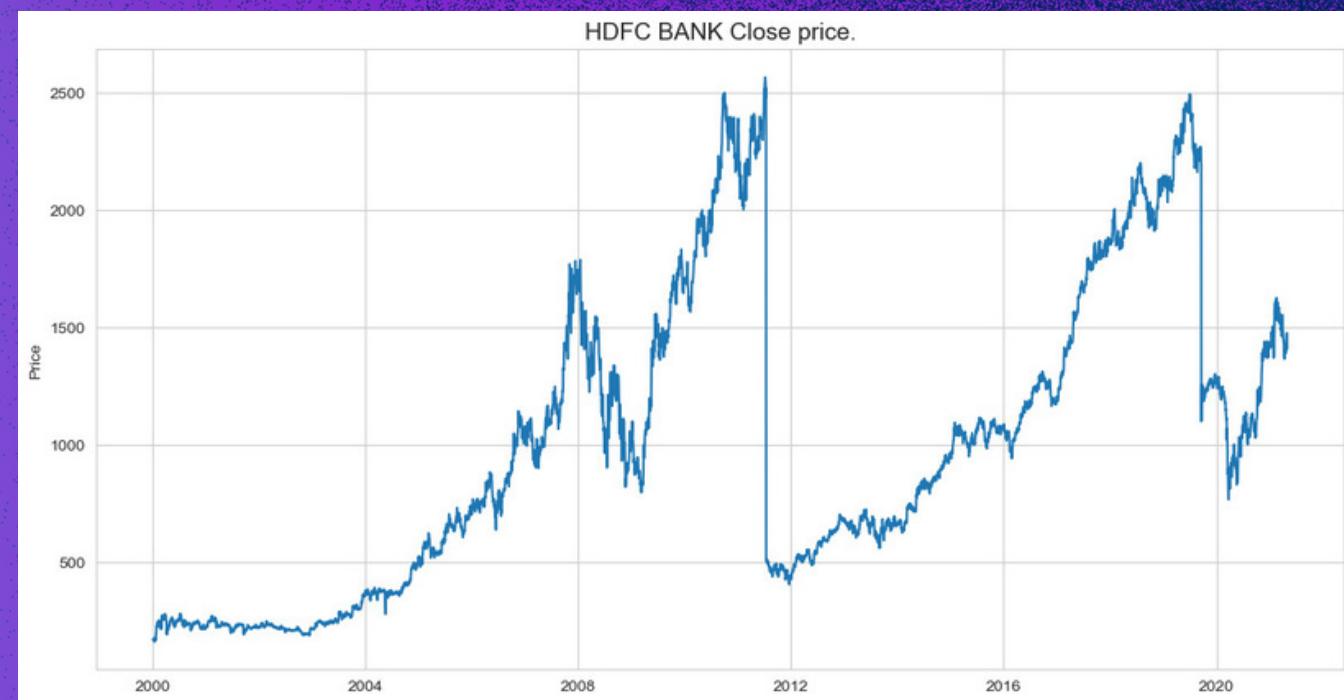
ARIMA, SHORT FOR 'AUTO REGRESSIVE INTEGRATED MOVING AVERAGE' IS ACTUALLY A CLASS OF MODELS.

# STOCK WE USED HDFC BANK



We understand your world

THE HOUSING DEVELOPMENT FINANCE CORPORATION LIMITED OR HDFC LTD WAS AMONG THE FIRST FINANCIAL INSTITUTIONS IN INDIA TO RECEIVE AN “IN PRINCIPLE” APPROVAL FROM THE RESERVE BANK OF INDIA (RBI) TO SET UP A BANK IN THE PRIVATE SECTOR. THIS WAS DONE AS PART OF RBI’S POLICY FOR LIBERALISATION OF THE INDIAN BANKING INDUSTRY IN 1994.



# RESULTS FROM OUR MODEL

Risk (Standard Deviation of Daily Returns): 0.02174389254042105

Sharpe Ratio: 0.40845787113628784

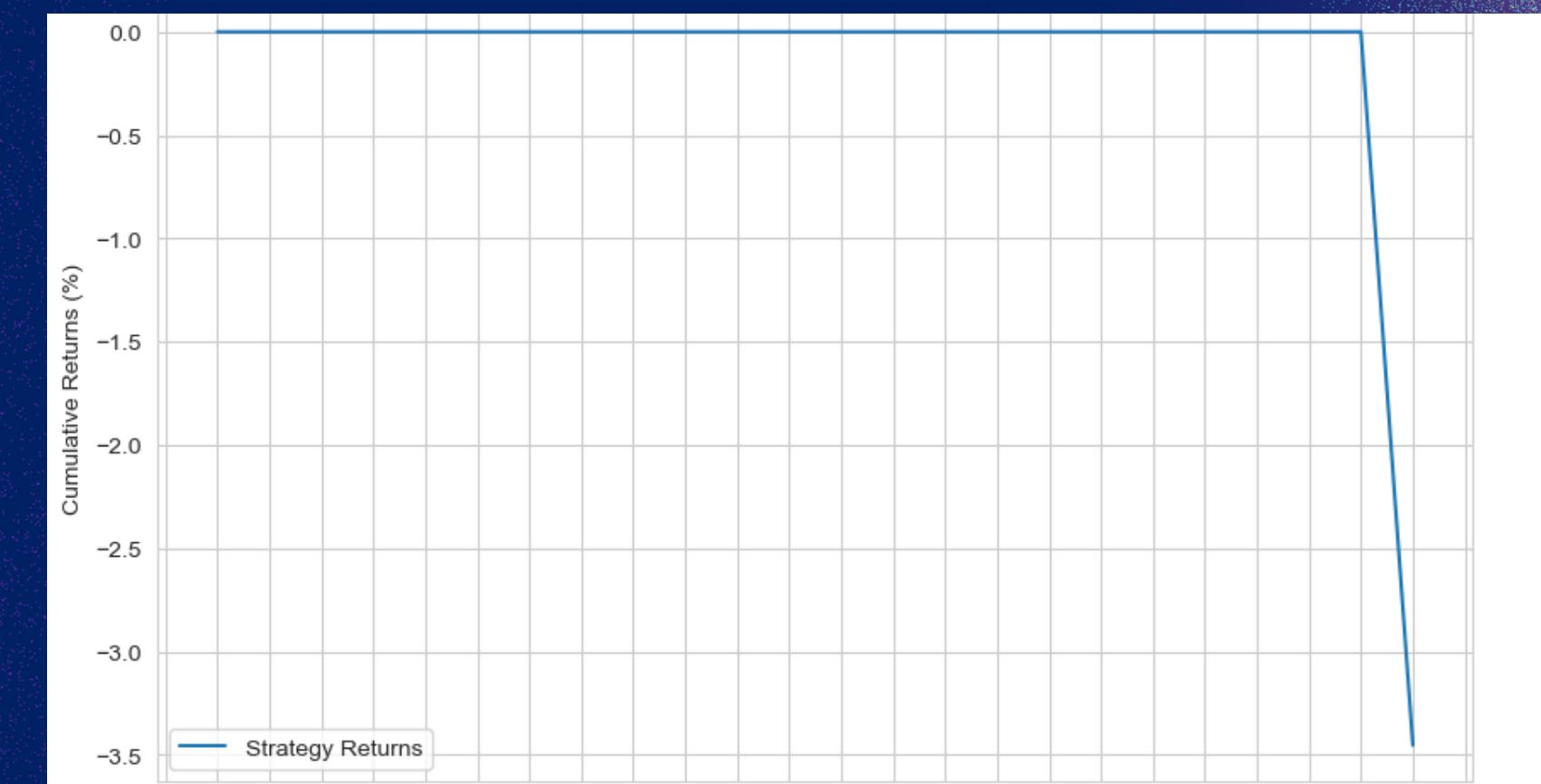
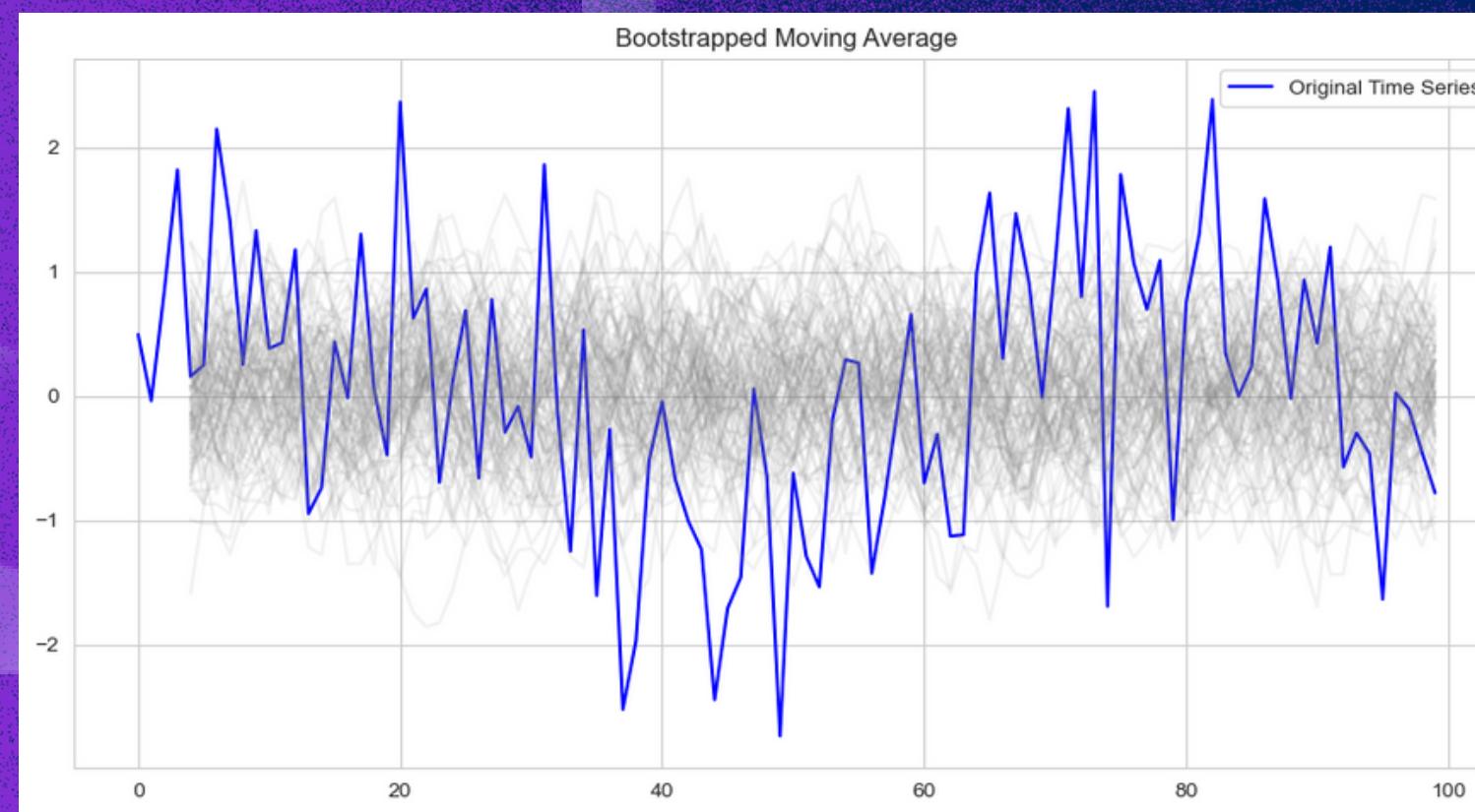
Optimal Parameters: [ 2.64803032 14.4687888 0.16691876]

Optimal Sharpe Ratio: 0.40845787113628784

Risk (Standard Deviation of Daily Returns): 0.02174389254042105

Average Daily Return: 0.0005594796469931566

Sharpe Ratio: 0.40845787113628784.



BOOTSTRAPPED MOVING AVERAGE

MOMENTUM STRATEGY BACKTEST WITH RISK  
AND SHARPE RATIO

**THANK YOU!**  
**DEHRADUN**  
**CARTEL**  
**SIGNING OFF**

