Report On

# Open Chain Analysis

Submitted in partial fulfillment of the requirements of the Course project in Semester VII of Final Year Artificial Intelligence and Data Science


by
Yash Patil (Roll No. 18)
Yatish Patil (Roll No. 19)
Chetan Nevase (Roll No. 17)

Supervisor
Prof. Bhavika Gharat




**University of Mumbai**

**Vidyavardhini's College of Engineering & Technology**

**Department of Artificial Intelligence and Data Science**



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# Vidyavardhini's College of Engineering & Technology
# Department of Artificial Intelligence and Data Science

## CERTIFICATE

This is to certify that the project entitled “Open Chain Analysis” is a bonafide work of "Yash Patil (Roll No. 18), Yatish Patil (Roll No. 19), Chetan Nevase (Roll No. 17)" submitted to the University of Mumbai in partial fulfillment of the requirement for the Course project in semester VII of Final Year Artificial Intelligence and Data Science engineering.

**Supervisor**
Prof. Bhavika Gharat

Dr. Tatwadarshi P. N.
Head of Department

# Abstract

The "Open Chain Analyzer" project is a cutting-edge Big Data Analytics initiative aimed at providing in-depth real-time analysis of option chains, catering to the needs of traders in the National Stock Exchange (NSE) of India. This comprehensive document offers a detailed insight into the project, outlining its rich array of features and functionalities.

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# Chapter # 1

## 1.1 Problem Statement:

The financial market operates at a relentless pace, and to navigate it successfully, traders need to have access to up-to-the-minute and reliable data. Yet, managing and analyzing the intricate web of data in real-time presents several significant challenges, such as the sheer volume of data, the potential for duplicated information, and the critical requirement for quick response to rapidly changing market conditions.

# Chapter # 2

## 2.1 Description and Working:

The "Open Chain Analyzer" is a sophisticated Big Data Analytics project tailored to serve the needs of traders operating in the National Stock Exchange (NSE) of India. This project offers a comprehensive system for real-time analysis of option chain data, empowering traders with valuable insights to make informed investment decisions.

The "Open Chain Analyzer" project works by:

Continuously fetching real-time data from the NSE server for accurate trader information.
Preventing duplicate data to maintain data integrity and focus on recent changes.
Supporting multiple instances for diverse portfolio analysis.
Using visual cues (red and green colors) for easy data interpretation.
Sending toast notifications for prompt responses to market trend changes.
Allowing customization of program titles for better management.
Offering manual control over the program to align with trader preferences.
Providing user-friendly data handling features, simplifying data selection and copying.
Enabling data export to .csv files and real-time data row exports.
Implementing an auto-stop feature to halt the program at market closing (3:30 pm).
Notifying users of delayed server updates (over 5 minutes).
Checking for software updates automatically to stay current.
Logging for troubleshooting and maintenance.
Saving user preferences for quick setup in subsequent runs.
Including keyboard shortcuts for enhanced user navigation.

## 2.2 Software & Hardware Used:

**Software:**

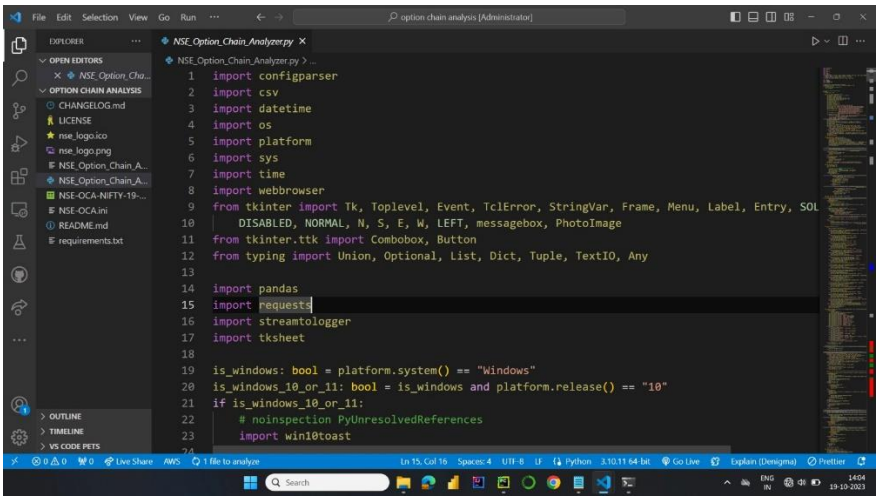
- Visual Studio Code
- Python 3.11
- Windows 11 OS

**Hardware:**

- 6gb RAM
- AMD Ryzen 5

# Chapter # 3

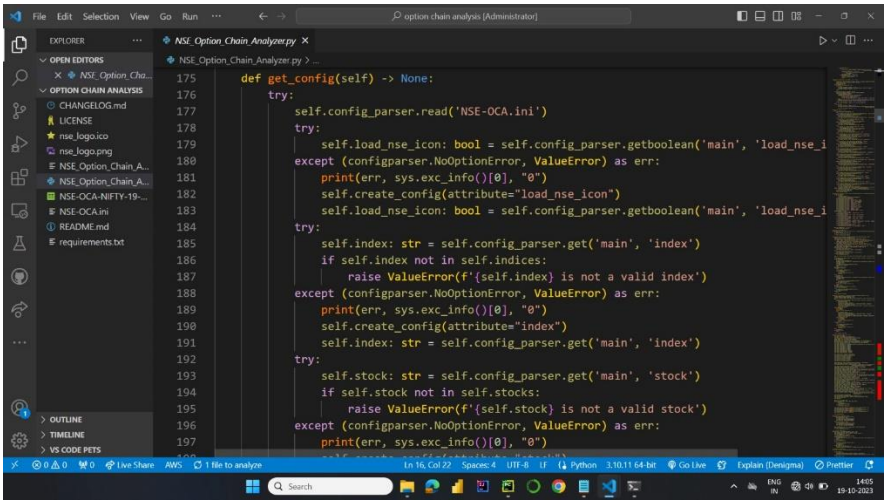
## 3.1 Code:



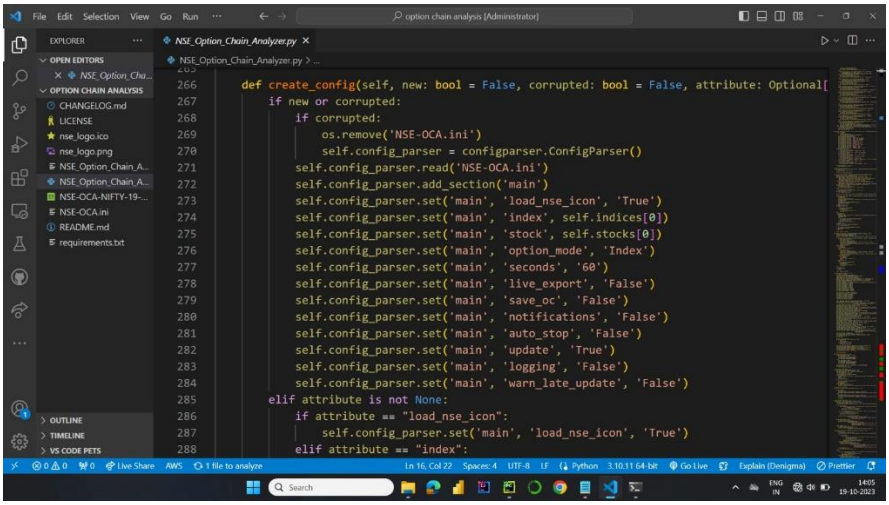
```python
import configparser
import csv
import datetime
import os
import platform
import sys
import time
import webbrowser
from tkinter import Tk, Toplevel, Event, TclError, StringVar, Frame, Menu, Label, Entry, SOL
    DISABLED, NORMAL, N, S, E, W, LEFT, messagebox, PhotoImage
from tkinter.ttk import Combobox, Button
from typing import Union, Optional, List, Dict, Tuple, TextIO, Any

import pandas
import requests
import streamtologger
import tksheet

is_windows: bool = platform.system() == "Windows"
is_windows_10_or_11: bool = is_windows and platform.release() == "10"
if is_windows_10_or_11:
    # noinspection PyUnresolvedReferences
    import win10toast
```

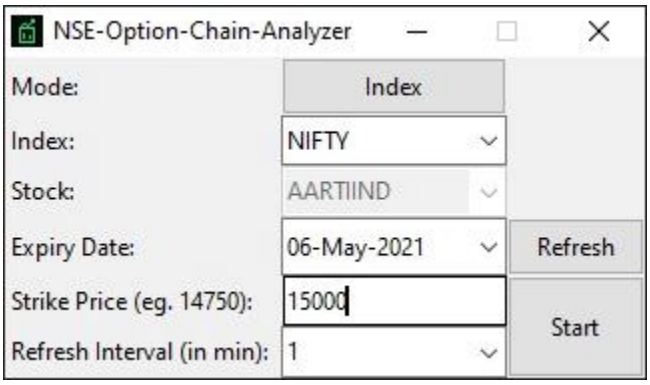


```python
    def get_config(self) -> None:
        try:
            self.config_parser.read('NSE-OCA.ini')
            try:
                self.load_nse_icon: bool = self.config_parser.getboolean('main', 'load_nse_i
            except (configparser.NoOptionError, ValueError) as err:
                print(err, sys.exc_info()[0], "0")
                self.create_config(attribute="load_nse_icon")
                self.load_nse_icon: bool = self.config_parser.getboolean('main', 'load_nse_i
            try:
                self.index: str = self.config_parser.get('main', 'index')
                if self.index not in self.indices:
                    raise ValueError(f'{self.index} is not a valid index')
            except (configparser.NoOptionError, ValueError) as err:
                print(err, sys.exc_info()[0], "0")
                self.create_config(attribute="index")
                self.index: str = self.config_parser.get('main', 'index')
            try:
                self.stock: str = self.config_parser.get('main', 'stock')
                if self.stock not in self.stocks:
                    raise ValueError(f'{self.stock} is not a valid stock')
            except (configparser.NoOptionError, ValueError) as err:
                print(err, sys.exc_info()[0], "0")
```



```python
    def create_config(self, new: bool = False, corrupted: bool = False, attribute: Optional[
        if new or corrupted:
            if corrupted:
                os.remove('NSE-OCA.ini')
                self.config_parser = configparser.ConfigParser()
            self.config_parser.read('NSE-OCA.ini')
            self.config_parser.add_section('main')
            self.config_parser.set('main', 'load_nse_icon', 'True')
            self.config_parser.set('main', 'index', self.indices[0])
            self.config_parser.set('main', 'stock', self.stocks[0])
            self.config_parser.set('main', 'option_mode', 'Index')
            self.config_parser.set('main', 'seconds', '60')
            self.config_parser.set('main', 'live_export', 'False')
            self.config_parser.set('main', 'save_oc', 'False')
            self.config_parser.set('main', 'notifications', 'False')
            self.config_parser.set('main', 'auto_stop', 'False')
            self.config_parser.set('main', 'update', 'True')
            self.config_parser.set('main', 'logging', 'False')
            self.config_parser.set('main', 'warn_late_update', 'False')
        elif attribute is not None:
            if attribute == "load_nse_icon":
                self.config_parser.set('main', 'load_nse_icon', 'True')
            elif attribute == "index":
```

## 3.2 Results:




NSE-Option-Chain-Analyzer - TATASTEEL - 27-May-2021 - 1090

Menu

| | Time | Value | Call Sum (in 10s) | Put Sum (in 10s) | Difference (in 10s) | Call Boundary (in 10s) | Put Boundary (in 10s) | Call ITM | Put ITM |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 13:32:55 | 1093.7 | -102.4 | 74.8 | -177.2 | 4.5 | 11.3 | 1.0 | -3.4 |
| 10 | 13:34:25 | 1094.2 | -102.2 | 74.9 | -177.1 | 4.4 | 11.3 | 1.0 | -3.4 |
| 11 | 13:35:55 | 1093 | -102.7 | 73.7 | -176.4 | 4.4 | 11.2 | 1.1 | -3.3 |
| 12 | 13:37:25 | 1093 | -102.7 | 73.7 | -176.4 | 4.4 | 11.2 | 1.1 | -3.3 |
| 13 | 13:38:25 | 1092.45 | -103.3 | 73.9 | -177.2 | 4.4 | 11.2 | 1.2 | -3.4 |
| 14 | 13:39:25 | 1092.45 | -102.5 | 73.5 | -176.0 | 5.2 | 11.2 | 1.2 | -3.4 |
| 15 | 13:40:49 | 1092.85 | -102.5 | 73.5 | -176.0 | 5.2 | 11.2 | 1.2 | -3.4 |
| 16 | 13:41:55 | 1093.9 | -103.1 | 73.8 | -176.9 | 5.2 | 11.4 | 1.3 | -3.4 |
| 17 | 13:42:55 | 1093.9 | -103.1 | 73.8 | -176.9 | 5.2 | 11.4 | 1.3 | -3.4 |
| 18 | 13:44:26 | 1094.6 | -103.2 | 72.8 | -176.0 | 4.9 | 11.4 | 1.3 | -3.4 |
| 19 | 13:45:26 | 1094.6 | -103.2 | 72.8 | -176.0 | 4.9 | 11.4 | 1.3 | -3.4 |
| 20 | 13:46:22 | 1094.8 | -103.3 | 72.8 | -176.1 | 4.9 | 11.4 | 1.3 | -3.4 |
| 21 | 13:47:18 | 1100 | -106.0 | 73.0 | -179.0 | 4.8 | 11.2 | 1.3 | -3.5 |

| Open Interest Upper Boundary | | | | Open Interest Lower Boundary | | | |
|---|---|---|---|---|---|---|---|
| Strike Price 1: | 1100.0 | OI (in 10s): | 244.4 | Strike Price 1: | 1000.0 | OI (in 10s): | 233.1 |
| Strike Price 2: | 1000.0 | OI (in 10s): | 90.4 | Strike Price 2: | 1050.0 | OI (in 10s): | 137.7 |
| Open Interest: | | Bullish | | PCR: | | 1.0 | |
| Call Exits: | | Yes | | Put Exits: | | No | |
| Call ITM: | | No | | Put ITM: | | No | |

NSE-Option-Chain-Analyzer - NIFTY - 06-May-2021 - 15000

Menu

| | Time | Value | Call Sum (in K) | Put Sum (in K) | Difference (in K) | Call Boundary (in K) | Put Boundary (in K) | Call ITM | Put ITM |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 13:33:25 | 14696.9 | 23.7 | 0.5 | 23.2 | -0.6 | 0.6 | 0.1 | -42.0 |
| 10 | 13:34:55 | 14690.8 | 23.7 | 0.5 | 23.2 | -0.6 | 0.6 | 0.1 | -42.0 |
| 11 | 13:35:55 | 14672.75 | 23.3 | 0.5 | 22.8 | -0.7 | 0.6 | 0.1 | -43.0 |
| 12 | 13:36:55 | 14672.75 | 23.3 | 0.5 | 22.8 | -0.7 | 0.6 | 0.1 | -43.0 |
| 13 | 13:38:25 | 14685.4 | 22.4 | 0.5 | 21.9 | -0.8 | 0.6 | 0.1 | -37.0 |
| 14 | 13:39:25 | 14685.4 | 22.4 | 0.5 | 21.9 | -0.8 | 0.6 | 0.1 | -37.0 |
| 15 | 13:40:24 | 14686.9 | 22.4 | 0.5 | 21.9 | -0.8 | 0.6 | 0.1 | -37.0 |
| 16 | 13:41:25 | 14698.4 | 21.8 | 0.5 | 21.3 | -0.8 | 0.6 | 0.0 | -30.2 |
| 17 | 13:42:55 | 14698.4 | 21.8 | 0.5 | 21.3 | -0.8 | 0.6 | 0.0 | -30.2 |
| 18 | 13:43:56 | 14697.3 | 15.2 | 0.5 | 14.7 | -1.1 | 0.6 | 0.0 | -20.6 |
| 19 | 13:45:26 | 14703.05 | 15.2 | 0.5 | 14.7 | -1.1 | 0.6 | 0.0 | -20.6 |
| 20 | 13:46:54 | 14703.05 | 15.2 | 0.5 | 14.7 | -1.1 | 0.6 | 0.0 | -20.6 |
| 21 | 13:47:51 | 14703.55 | 10.5 | 0.5 | 10.0 | -1.2 | 0.6 | 0.1 | -49.5 |

| Open Interest Upper Boundary | | | | Open Interest Lower Boundary | | | |
|---|---|---|---|---|---|---|---|
| Strike Price 1: | 15000.0 | OI (in K): | 95.2 | Strike Price 1: | 14600.0 | OI (in K): | 91.0 |
| Strike Price 2: | 14800.0 | OI (in K): | 93.1 | Strike Price 2: | 14700.0 | OI (in K): | 57.8 |
| Open Interest: | | Bearish | | PCR: | | 1.01 | |
| Call Exits: | | Yes | | Put Exits: | | No | |
| Call ITM: | | Yes | | Put ITM: | | Yes | |

## Conclusion and Future Work:

In conclusion, the "Open Chain Analyzer" project represents a significant advancement in the world of financial trading. It offers real-time analysis of option chain data, addresses critical challenges related to data management, and provides traders with the tools they need to navigate the fast-paced and dynamic financial markets effectively. With continuous updates, user-friendly features, and comprehensive data display, this system enhances traders' ability to make informed decisions and seize trading opportunities in real-time, ultimately contributing to their success in the financial market.

# Chapter # 4

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