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Solution Design for Capstone Project

The suggested approach is coded in python which consists of several Jupyter notebooks, and these notebooks have been shared on Google Colab through a shared Google Drive folder.

# Data Retrieval

In order to prevent any hindrance from Yahoo Finance API, the authors retrieved the data from the API and saved it in a CSV file named "NiftyHistoricalData.csv". This file was then utilized in all the notebooks.

# Requirements

All the libraries used in the project, including their respective versions, are listed in the requirements.txt file.

# Jupyter Notebooks

Even though, each notebook is provided with detailed comments wherever necessary to understand the code. Also, a comprehensive explanation of each notebook is presented below:

## 3.1 001 Dip Trip on Nifty 50

In this notebook, the Nifty historical data in CSV format was imported, and exploratory analysis was conducted on the Nifty 50 data. This included the segmentation of pullback percentage into four categories, namely, less than 10%, 10-20%, 20-40%, and more than 40%. Subsequently, a Python class was developed to generate a dataframe that provides signals based on the dip-trip strategy.

## 3.2 002 Coiled Spring on Nifty 50

The CSV-formatted Nifty historical data was imported into this notebook and used to identify pivot points by assuming a certain number of forward and backward candles. Additionally, backtesting on historical data to identify the various coiled spring patterns based on certain conditions, such as the number of days of candles to be considered when detecting the pattern.

## 3.3 003 Regime Shift on Nifty 50

This notebook begins by importing Nifty historical data in CSV format and conducting exploratory analysis on the mean and standard deviation of Nifty 50 returns. The data is then split into a training set and a testing set in a 60:40 ratio. The KMeans clustering algorithm is applied, assuming four distinct groups, to identify different regimes in the market. Finally, graphs are plotted to illustrate the various regimes in the Nifty 50 for historical data.

## 3.4 004 Comparison of Dip Trip + Regime Shift + Coiled Spring

In this notebook, the proposed methodology developed in the previous three notebooks has been integrated to assess its performance. Graphs and a summary report table are generated based on this integration.