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Stock Recommendation Prediction using NLP

Cyber Cypher 2.0

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Library Information

1. Flair :-Flair is a simple natural language processing (NLP) library developed and open-sourced by Zalando Research. Flair's framework builds directly on PyTorch.

2. PyTorch : PyTorch is an open source machine learning (ML) framework based on the Python programming language and the Torch library.

3. Matplotlib : Matplotlib is a comprehensive library for creating static, animated, and interactive visualizations in Python.

Library Information

4 Scikit Learn : scikit-learn is a free software machine learning library for the Python programming language.

5 Pandas: Pandas is a software library written for the Python programming language for data manipulation and analysis.

Code Snippets

```
# Commands to install libraries
!pip install flair
!pip install torch torchvision torchaudio --extra-index-url https://download.pytorch.org/whl/cu117
!pip install matplotlib
```

```
import pandas as pd
pd.set_option('display.max_colwidth', None)
import flair
sentiment_model = flair.models.TextClassifier.load('en-sentiment')
import matplotlib.pyplot as plt
```

Creating Dataframe

```
df = pd.read_csv('test.csv')
df
```

Taking User Input for Company Type

```
print(df['Type'].unique())
companyType = input('Choose Company Type: ')
```

Code Snippets

Prediction

```
df2 = df[df['Type'] == companyType.upper()]
length = len(df2['Symbol'].unique())

growthDf = pd.DataFrame(columns = ['Symbol', 'Growth', 'Profit/Loss'])
index = 1

row = 1
for x in df2['Symbol'].unique():
    plt.subplot(2, length // 2, index)
    index += 1
    if row <= length // 2:
        plt.title(x)
    else:
        plt.xlabel(x)
    row += 1
    plt.plot(df2[df2['Symbol'] == x]['Date'], df2[df2['Symbol'] == x]['Close'])
```

Code Snippets

```
    first = df2[df2['Symbol'] == x].iloc[0]
    last = df2[df2['Symbol'] == x].iloc[-1]
    growth = int(last['Close']) - int(first['Open'])
    pl = ''

    if growth < 0:
        pl = 'Loss'
    elif growth > 0:
        pl = 'Profit'
    else:
        pl = 'Stable'
    growthDf.loc[len(growthDf)] = [x, growth, pl]
```

Final Output

```
growthDf['Sentiment'] = sentiment
growthDf['Confidence'] = confidence
growthDf
```

```
sentiment = []
confidence = []
for value in growthDf['Profit/Loss']:
    sample = flair.data.Sentence(value)
    sentiment_model.predict(sample)
    sentiment.append(sample.labels[0].value)
    confidence.append(sample.labels[0].score)
plt.suptitle('5 Year Growth Graph of Companies under ' + companyType + ' sector:')
plt.show()
```

Dataset Snippet

	Date	Symbol	Type	Series	Prev Close	Open	High	Low	Last	Close
0	01-04-2016	WIPRO	IT	EQ	564.25	567.00	572.50	557.20	561.50	562.15
1	04-04-2016	WIPRO	IT	EQ	562.15	566.90	571.10	563.15	565.00	566.25
2	05-04-2016	WIPRO	IT	EQ	566.25	566.25	566.60	557.25	557.60	559.00
3	06-04-2016	WIPRO	IT	EQ	559.00	560.00	562.00	552.75	558.10	558.20
4	07-04-2016	WIPRO	IT	EQ	558.20	558.00	560.00	550.35	551.00	551.80
...	...	...	...	...	...	...	...	...	...	...
33421	24-03-2021	ASIANPAINT	CONSUMER GOODS	EQ	2410.30	2410.30	2470.00	2410.00	2444.00	2443.55
33422	25-03-2021	ASIANPAINT	CONSUMER GOODS	EQ	2443.55	2450.95	2469.00	2392.00	2402.80	2402.20
33423	26-03-2021	ASIANPAINT	CONSUMER GOODS	EQ	2402.20	2425.00	2513.95	2409.10	2498.00	2505.15
33424	30-03-2021	ASIANPAINT	CONSUMER GOODS	EQ	2505.15	2539.10	2583.45	2521.50	2571.25	2578.05
33425	31-03-2021	ASIANPAINT	CONSUMER GOODS	EQ	2578.05	2578.05	2582.95	2531.00	2537.00	2537.40

33426 rows × 10 columns

Output Snippets

```
Company Types:  ['IT' 'METALS' 'AUTOMOBILE' 'PHARMA' 'ENERGY' 'FINANCIAL SERVICES'
 'CONSUMER GOODS']
Choose Company Type:  AUTOMOBILE
```

	Symbol	Growth	Profit/Loss	Sentiment	Confidence
0	TATAMOTORS	-85	Loss	NEGATIVE	0.999430
1	M&M	-411	Loss	NEGATIVE	0.999430
2	MARUTI	3159	Profit	POSITIVE	0.985017
3	HEROMOTOCO	-18	Loss	NEGATIVE	0.999430

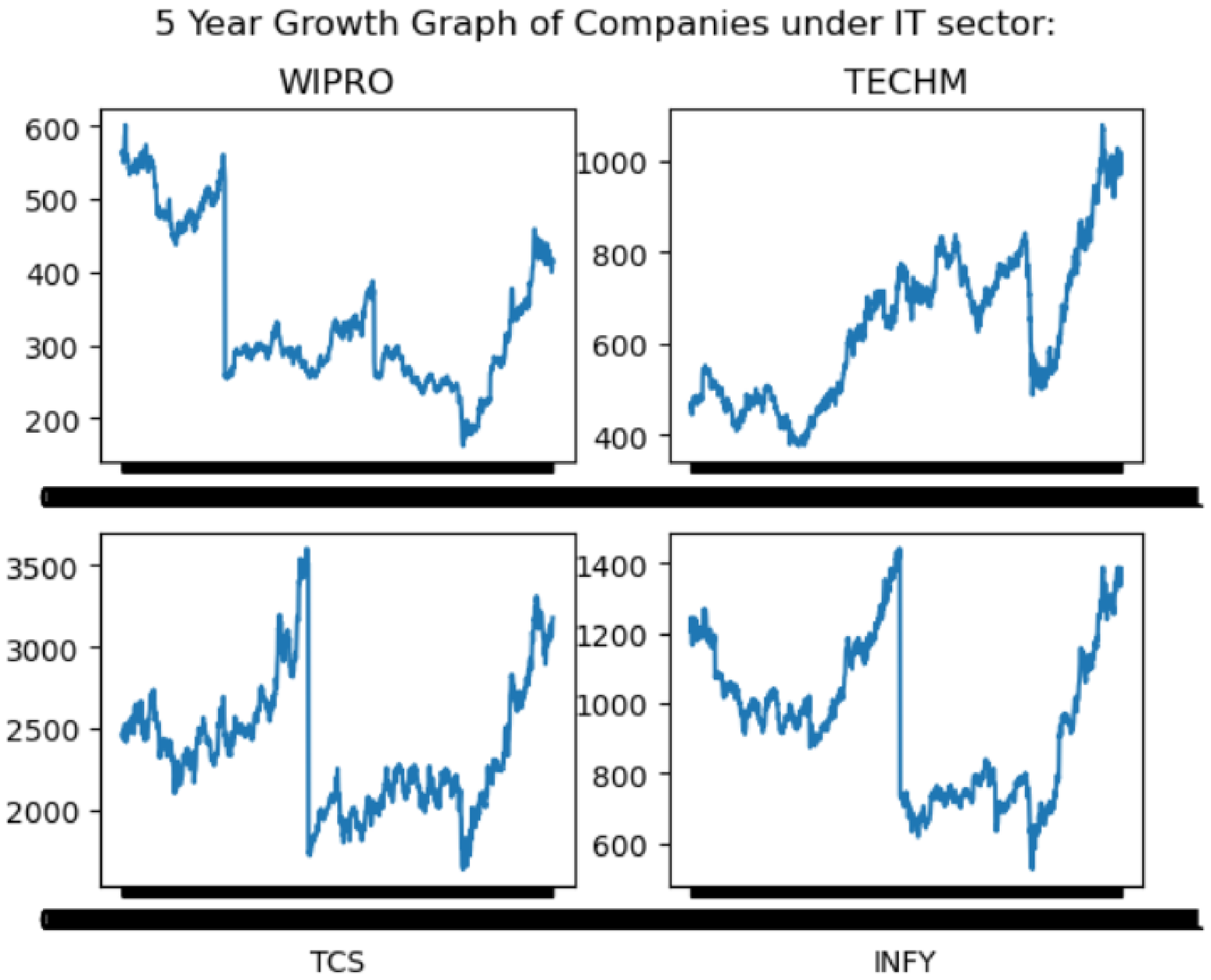
Net growth of the stock over a period of 5 years

Output Snippets

	Symbol	Growth	Profit/Loss	Sentiment	Confidence
0	WIPRO	-153	Loss	NEGATIVE	0.999430
1	TECHM	515	Profit	POSITIVE	0.985017
2	TCS	672	Profit	POSITIVE	0.985017
3	INFY	152	Profit	POSITIVE	0.985017

Net growth of the stock over a period of 5 years (IT Industry)

Output Snippets



Conclusion

- **Taking the top-down approach by asking the user to choose an industry and recommending the best stock in the industry which has done comparatively better than its peers .**

- **Showing the trends of the market in the last 5 years which help in technical analysis of patterns**

✨ Thank You !! ✨