ESTUDO SOBRE ANÁLISE DE AÇÕES + MACHINE LEARNING

Bibliotecas usadas

In [1]:
```
import yfinance as yf
import matplotlib.pyplot as plt
import pandas as pd
import matplotlib.dates as mdates
from prophet import Prophet
from prophet.plot import plot_plotly
import plotly.graph_objects as go
```

```
C:\Users\Administrador\AppData\Local\Programs\Python\Python312\Lib\site-packages\tqdm\auto.py:21: TqdmWarning: IProgress not found. Please update jupyter and ipywidgets. See https://ipywidgets.readthedocs.io/en/stable/user_install.html
  from .autonotebook import tqdm as notebook_tqdm
```

Identificando a ação

Código

In [2]:
```
acao = input("Insira a ação para o estudo: ")
ticker_acao = yf.Ticker(acao)
```

Ação analisada:

In [3]:
```
acao
```

Out[3]:
```
'PETR4.SA'
```

Histórico da ação

Código

In [4]:
```
historico = ticker_acao.history()
historico.index = pd.to_datetime(historico.index)
historico.index = historico.index.strftime('%Y-%m-%d')
```

```
C:\Users\Administrador\AppData\Local\Programs\Python\Python312\Lib\site-packages\yfinance\utils.py:775: FutureWarning: The 'unit' keyword in TimedeltaIndex construction is deprecated and will be removed in a future version. Use pd.to_timedelta instead.
  df.index += _pd.TimedeltaIndex(dst_error_hours, 'h')
```

In [5]:
```
historico
```

Out[5]:

Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
2024-01-02	37.439999	37.889999	37.400002	37.779999	24043800	0.0	0.0
2024-01-03	37.799999	39.119999	37.669998	38.959999	52300200	0.0	0.0
2024-01-04	39.119999	39.349998	38.509998	38.630001	45344900	0.0	0.0
2024-01-05	38.869999	39.139999	38.410000	38.720001	35783700	0.0	0.0
2024-01-08	38.380001	38.430000	37.610001	38.430000	35158100	0.0	0.0
2024-01-09	38.669998	38.750000	38.029999	38.099998	27279000	0.0	0.0
2024-01-10	38.099998	38.270000	37.509998	37.750000	27382000	0.0	0.0
2024-01-11	37.980000	38.150002	37.700001	38.070000	26564400	0.0	0.0
2024-01-12	38.500000	38.730000	38.169998	38.169998	24479500	0.0	0.0
2024-01-15	37.990002	38.619999	37.860001	38.580002	13818300	0.0	0.0
2024-01-16	38.610001	38.790001	38.080002	38.099998	31277700	0.0	0.0
2024-01-17	37.970001	38.150002	37.820000	37.880001	27577300	0.0	0.0
2024-01-18	38.139999	38.139999	37.560001	37.730000	22987200	0.0	0.0
2024-01-19	37.810001	37.900002	37.230000	37.529999	31745200	0.0	0.0
2024-01-22	37.500000	37.810001	37.230000	37.700001	22753700	0.0	0.0
2024-01-23	37.840000	38.369999	37.430000	38.169998	32498500	0.0	0.0
2024-01-24	38.290001	38.540001	37.770000	37.880001	25415300	0.0	0.0
2024-01-25	38.259998	39.279999	38.130001	39.279999	48655300	0.0	0.0
2024-01-26	39.099998	40.090000	38.910000	39.959999	41378200	0.0	0.0
2024-01-29	40.000000	40.590000	39.830002	40.470001	28345300	0.0	0.0

Análise de 6 meses

Código

In [6]:
```
seis_meses = ticker_acao.history("6mo")
fechamento = seis_meses.Close
seis_meses.index = pd.to_datetime(seis_meses.index)
seis_meses.index = seis_meses.index.strftime('%Y-%m-%d')
fechamento.index = pd.to_datetime(fechamento.index)
fechamento.index = fechamento.index.strftime('%Y-%m-%d')
abertura = seis_meses.Open
abertura.index = pd.to_datetime(abertura.index)
abertura.index = abertura.index.strftime('%Y-%m-%d')
```

```
C:\Users\Administrador\AppData\Local\Programs\Python\Python312\Lib\site-packages\yfinance\utils.py:775: FutureWarning: The 'unit' keyword in TimedeltaIndex construction is deprecated and will be removed in a future version. Use pd.to_timedelta instead.
  df.index += _pd.TimedeltaIndex(dst_error_hours, 'h')
```

Visualização de dados

In [7]:
```
seis_meses
```

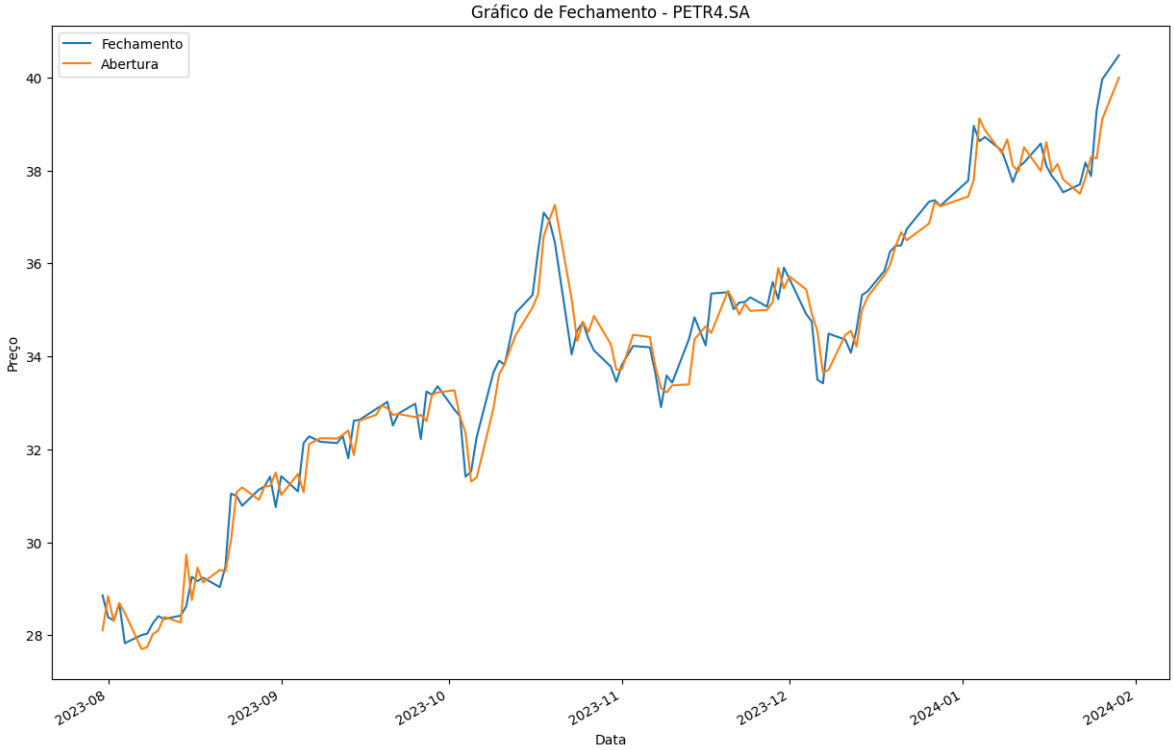
Out[7]:

Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
2023-07-31	28.107458	28.895951	28.107458	28.858847	91290800	0.0	0.0
2023-08-01	28.840295	28.840295	27.782787	28.385752	75752400	0.0	0.0
2023-08-02	28.302263	28.367197	27.643638	28.320816	62068400	0.0	0.0
2023-08-03	28.691871	28.877398	28.404303	28.682594	57304400	0.0	0.0
2023-08-04	28.478514	28.886674	27.587980	27.829166	120685800	0.0	0.0
...	...	...	...	...	...	...	...
2024-01-23	37.840000	38.369999	37.430000	38.169998	32498500	0.0	0.0
2024-01-24	38.290001	38.540001	37.770000	37.880001	25415300	0.0	0.0
2024-01-25	38.259998	39.279999	38.130001	39.279999	48655300	0.0	0.0
2024-01-26	39.099998	40.090000	38.910000	39.959999	41378200	0.0	0.0
2024-01-29	40.000000	40.590000	39.830002	40.480000	28365200	0.0	0.0

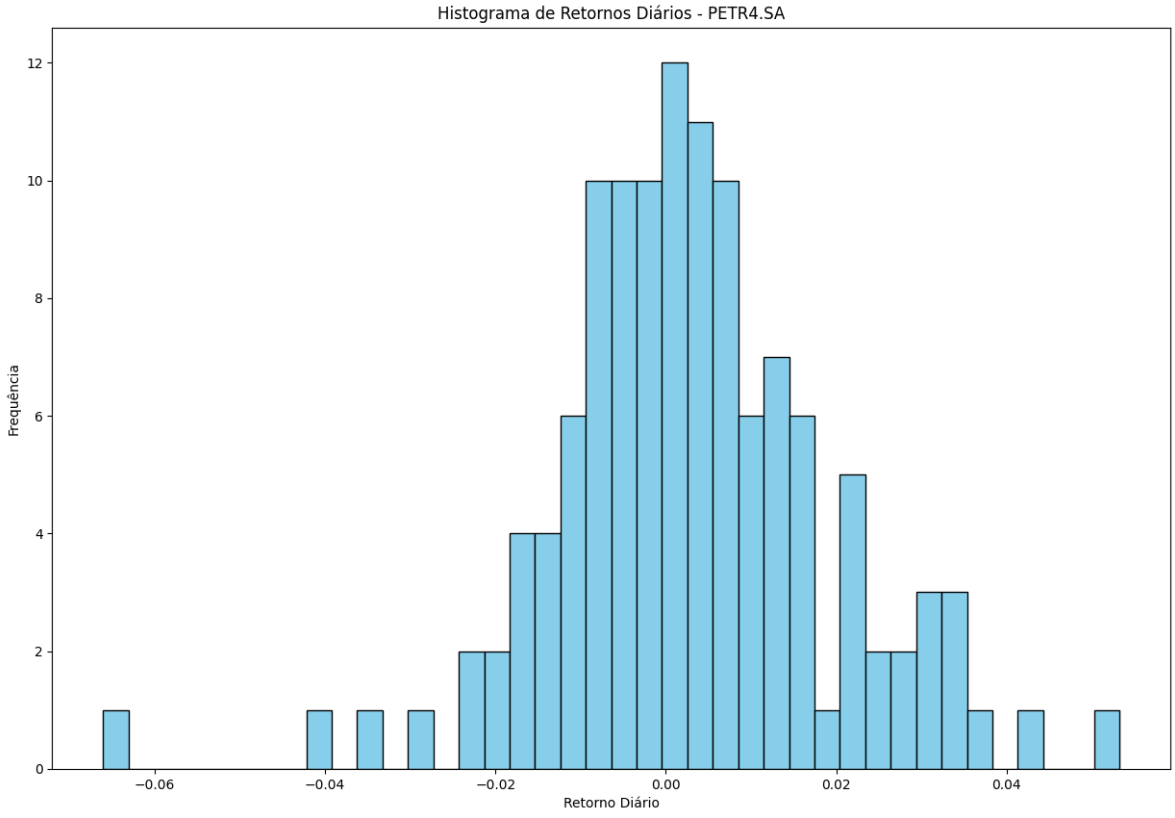
124 rows × 7 columns

In [8]:
```
plt.figure(figsize=(15,10))
fechamento.index = pd.to_datetime(fechamento.index)
abertura.index = pd.to_datetime(abertura.index)
fechamento.plot(label='Fechamento')
abertura.plot(label='Abertura')
plt.title(f"Gráfico de Fechamento - {acao}")
plt.xlabel('Data')
plt.ylabel('Preço')
plt.legend()
```

Out[8]:
```
<matplotlib.legend.Legend at 0x1c3c49924e0>
```



In [9]:
```
plt.figure(figsize=(15,10))
seis_meses['Daily_Return'] = seis_meses['Close'].pct_change()
plt.hist(seis_meses['Daily_Return'], bins=40, color='skyblue', edgecolor='black')
plt.xlabel('Retorno Diário')
plt.ylabel('Frequência')
plt.title(f'Histograma de Retornos Diários - {acao}')
figura_histograma = plt.gcf()
```



Previsões com machine learning

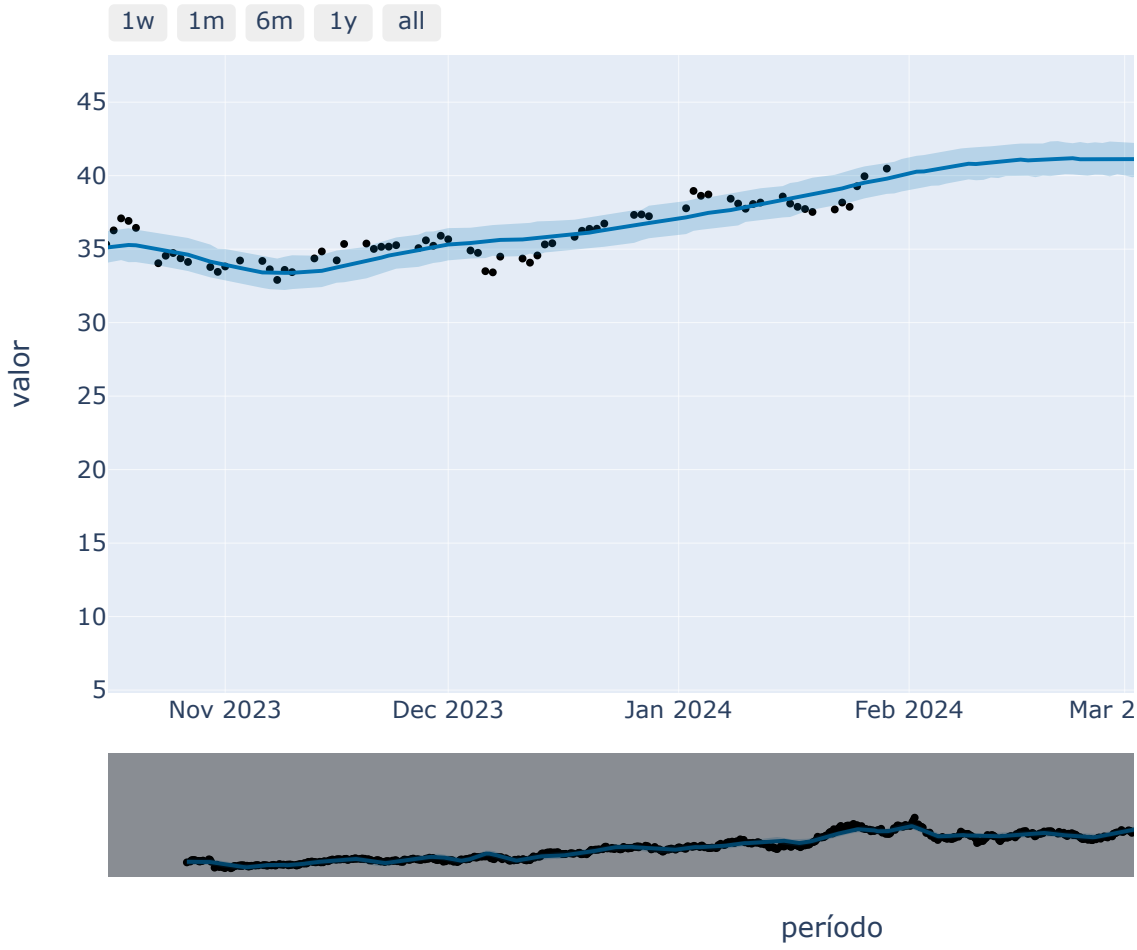
In [10]:
```
historico2 = ticker_acao.history("3y")
```

```
C:\Users\Administrador\AppData\Local\Programs\Python\Python312\Lib\site-packages\yfinance\utils.py:775: FutureWarning: The 'unit' keyword in TimedeltaIndex construction is deprecated and will be removed in a future version. Use pd.to_timedelta instead.
  df.index += _pd.TimedeltaIndex(dst_error_hours, 'h')
```

In [11]:
```
treinamento = historico2.reset_index()
treinamento["Date"] = treinamento["Date"].dt.tz_localize(None)
treinamento = treinamento[['Date', 'Close']]
treinamento.columns = ['ds', 'y']
modelo = Prophet()
modelo.fit(treinamento)
periodo = modelo.make_future_dataframe(periods=90)
previsoes = modelo.predict(periodo)
```

```
18:03:47 - cmdstanpy - INFO - Chain [1] start processing
18:03:52 - cmdstanpy - INFO - Chain [1] done processing
```

In [12]:
```
plot_plotly(modelo, previsoes, xlabel = "período", ylabel="valor")
```



In [ ]: