



AndreFideles /  
desafio-processo-seletivo-mrv-2025

[Code](#)[Issues](#)[Pull requests](#)[Actions](#)[Projects](#)[Wiki](#)[Security](#)

## desafio-processo-seletivo-mrv-2025 / analise\_sentimentos.ipynb



AndreFideles Adiciona notebook com análise de sentimentos aplicada aos comentários... [...](#)

fcbfd8a · 3 days ago



712 lines (712 loc) · 979 KB

[Preview](#)[Code](#)[Blame](#)[Raw](#)

# Análise de Sentimentos - NPS MRV

Este notebook realiza uma análise exploratória e de sentimentos sobre os comentários da base NPS fornecida pela MRV no processo seletivo.

## Objetivos:

- Carregar a base de dados
- Limpar e pré-processar os comentários
- Aplicar análise de sentimentos
- Explorar insights iniciais com gráficos

In [2]:

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import nltk
from nltk.sentiment import SentimentIntensityAnalyzer
nltk.download('vader_lexicon')

# Carregar a base
df = pd.read_excel(r'C:\Users\andre\OneDrive\Área de Trabalho\Análise de Da

# Exibir primeiras Linhas
df.head()
```

Out[2]:

	Data Opinião	Classificacao do Respondente	Regional MRV	Cidade_Loja	Comentário	Codigo_Chamado_I
0	2023-01-01	Detrator	MG	Uberlândia	Aumentos demais na parcela do meu parcelamento...	
1	2023-01-03	Promotor	ES	Cariacica	NaN	
2	2023-01-02	Detrator	NE	João Pessoa	NaN	
3	2023-01-02	Detrator	NE	Feira de Santana	Atendimento e suporte péssimo	
4	2023-01-02	Promotor	SP	São José dos Campos	NaN	



## Limpeza e tratamento dos dados

In [3]:

```
# Remover comentários nulos
df = df[df['Comentário'].notna()].copy()

# Resetar índice
df.reset_index(drop=True, inplace=True)

print(f'Total de comentários válidos: {len(df)}')
df[['Comentário']].sample(5)
```

Total de comentários válidos: 15161

Out[3]:

### Comentário

<b>12708</b>	Bom
<b>2043</b>	Tive que resolver, problema sozinho.. referent...
<b>13542</b>	Essa nota é porque acredito que o ap poderia s...
<b>2551</b>	Minha história com a MRV e bem sucedida me aj...
<b>8182</b>	Ótimo atendimento



## Análise de Sentimentos com VADER

In [4]:

```
sia = SentimentIntensityAnalyzer()

# Aplicar análise de sentimento
df['sentiment_score'] = df['Comentário'].apply(lambda x: sia.polarity_scores(x))

# Classificar sentimento
def classify_sentiment(score):
    if score >= 0.05:
        return 'Positivo'
    elif score <= -0.05:
        return 'Negativo'
    else:
        return 'Neutro'

df['sentimento'] = df['sentiment_score'].apply(classify_sentiment)

df[['Comentário', 'sentiment_score', 'sentimento']].head(10)
```

Out[4]:

### Comentário sentiment\_score sentimento

<b>0</b>	Aumentos demais na parcela do meu parcelamento...	-0.296	Negativo
<b>1</b>	Atendimento e suporte péssimo	0.000	Neutro
<b>2</b>	Flexibilidad e	0.000	Neutro
<b>3</b>	Construção completa deve ser alterada.	0.000	Neutro
<b>4</b>	Excelente profissionais!!	0.000	Neutro
<b>5</b>	Bom atendimento	0.000	Neutro

<b>6</b>	Construção de qualidade.	0.000	Neutro
<b>7</b>	Melhorar na acústica dos APs, da pra escutar t...	0.000	Neutro
<b>8</b>	Na instrutura do dos AP	0.000	Neutro
<b>9</b>	O apartamento veio com acabamento muito ruim, ...	-0.296	Negativo



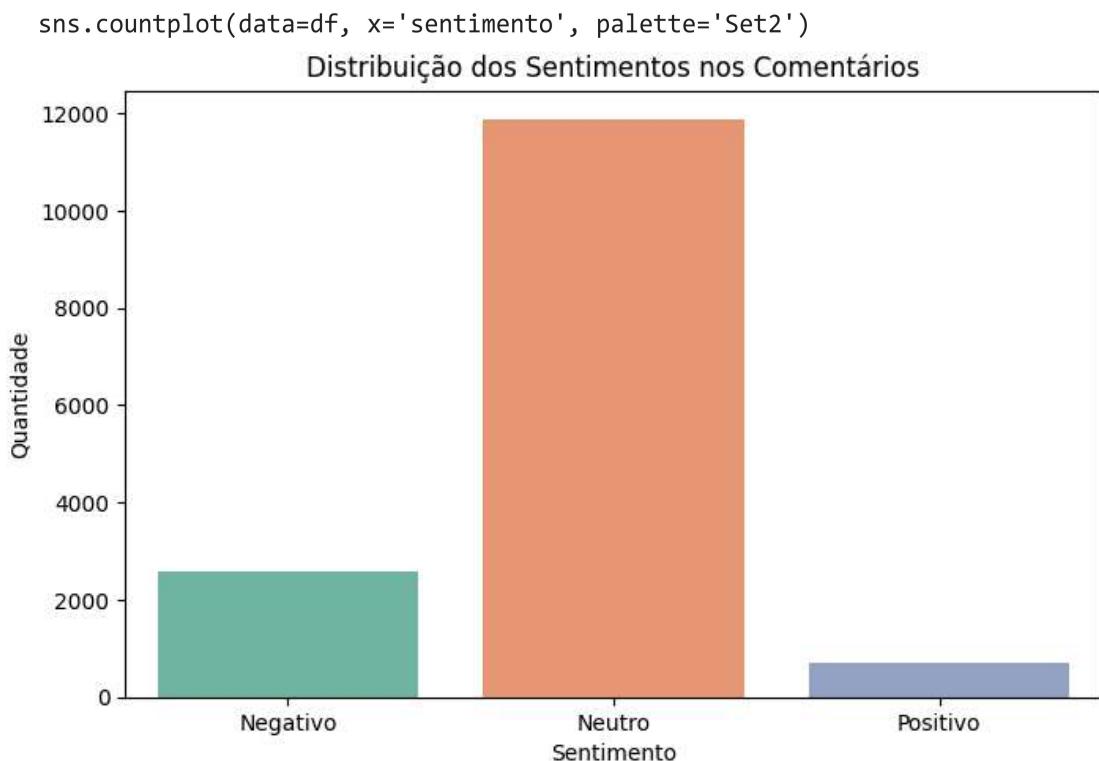
## Visualização dos sentimentos detectados

In [5]:

```
plt.figure(figsize=(8, 5))
sns.countplot(data=df, x='sentimento', palette='Set2')
plt.title('Distribuição dos Sentimentos nos Comentários')
plt.xlabel('Sentimento')
plt.ylabel('Quantidade')
plt.show()
```

C:\Users\andre\AppData\Local\Temp\ipykernel\_23544\13373794.py:2: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.



In [6]:

```
pip install wordcloud
```

Requirement already satisfied: wordcloud in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (1.9.4)  
Requirement already satisfied: numpy>=1.6.1 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from wordcloud) (2.2.4)  
Requirement already satisfied: pillow in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from wordcloud) (11.2.1)  
Requirement already satisfied: matplotlib in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from wordcloud) (3.10.3)  
Requirement already satisfied: contoursv>-1 & 1 in c:\users\andre\appdata\local

```
desafio-processo-seletivo-mrv-2025/analise_sentimentos.ipynb at main · AndreFideles/desafio-processo-seletivo-mrv-2025
Requirement already satisfied: al\programs\python\python313\lib\site-packages (from matplotlib->wordcloud)
(1.3.2)
Requirement already satisfied: cycler>=0.10 in c:\users\andre\appdata\local\pro
ograms\python\python313\lib\site-packages (from matplotlib->wordcloud) (0.1
2.1)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\andre\appdata\lo
cal\programs\python\python313\lib\site-packages (from matplotlib->wordcloud) (4.58.0)
Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\andre\appdata\lo
cal\programs\python\python313\lib\site-packages (from matplotlib->wordcloud)
(1.4.8)
Requirement already satisfied: packaging>=20.0 in c:\users\andre\appdata\lo
cal\programs\python\python313\lib\site-packages (from matplotlib->wordcloud) (2
5.0)
Requirement already satisfied: pyparsing>=2.3.1 in c:\users\andre\appdata\loc
al\programs\python\python313\lib\site-packages (from matplotlib->wordcloud)
(3.2.3)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\andre\appdata
\local\programs\python\python313\lib\site-packages (from matplotlib->wordclou
d) (2.9.0.post0)
Requirement already satisfied: six>=1.5 in c:\users\andre\appdata\local\progr
ams\python\python313\lib\site-packages (from python-dateutil>=2.7->matplotlib
->wordcloud) (1.17.0)
Note: you may need to restart the kernel to use updated packages.
```

In [7]: `!pip install wordcloud`

```
Requirement already satisfied: wordcloud in c:\users\andre\appdata\local\prog
rams\python\python313\lib\site-packages (1.9.4)
Requirement already satisfied: numpy>=1.6.1 in c:\users\andre\appdata\local\p
ograms\python\python313\lib\site-packages (from wordcloud) (2.2.4)
Requirement already satisfied: pillow in c:\users\andre\appdata\local\program
s\python\python313\lib\site-packages (from wordcloud) (11.2.1)
Requirement already satisfied: matplotlib in c:\users\andre\appdata\local\pro
grams\python\python313\lib\site-packages (from wordcloud) (3.10.3)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\andre\appdata\lo
cal\programs\python\python313\lib\site-packages (from matplotlib->wordcloud)
(1.3.2)
Requirement already satisfied: cycler>=0.10 in c:\users\andre\appdata\local\p
ograms\python\python313\lib\site-packages (from matplotlib->wordcloud) (0.1
2.1)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\andre\appdata\lo
cal\programs\python\python313\lib\site-packages (from matplotlib->wordcloud)
(4.58.0)
Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\andre\appdata\lo
cal\programs\python\python313\lib\site-packages (from matplotlib->wordcloud)
(1.4.8)
Requirement already satisfied: packaging>=20.0 in c:\users\andre\appdata\lo
cal\programs\python\python313\lib\site-packages (from matplotlib->wordcloud) (2
5.0)
Requirement already satisfied: pyparsing>=2.3.1 in c:\users\andre\appdata\loc
al\programs\python\python313\lib\site-packages (from matplotlib->wordcloud)
(3.2.3)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\andre\appdata
\local\programs\python\python313\lib\site-packages (from matplotlib->wordclou
d) (2.9.0.post0)
Requirement already satisfied: six>=1.5 in c:\users\andre\appdata\local\progr
ams\python\python313\lib\site-packages (from python-dateutil>=2.7->matplotlib
->wordcloud) (1.17.0)
```

In [8]: `from wordcloud import WordCloud  
import matplotlib.pyplot as plt`

```
# Gerar nuvem de palavras por sentimento
fig, axes = plt.subplots(1, 3, figsize=(20, 6))

for i, sentimento in enumerate(['Positivo', 'Neutro', 'Negativo']):
    comentarios = " ".join(df[df['sentimento'] == sentimento]['Comentário'])
    nuvem = WordCloud(width=800, height=400, background_color='white').generate(comentarios)

    axes[i].imshow(nuvem, interpolation='bilinear')
    axes[i].axis('off')
    axes[i].set_title(f'Nuvem de Palavras - {sentimento}', fontsize=14)

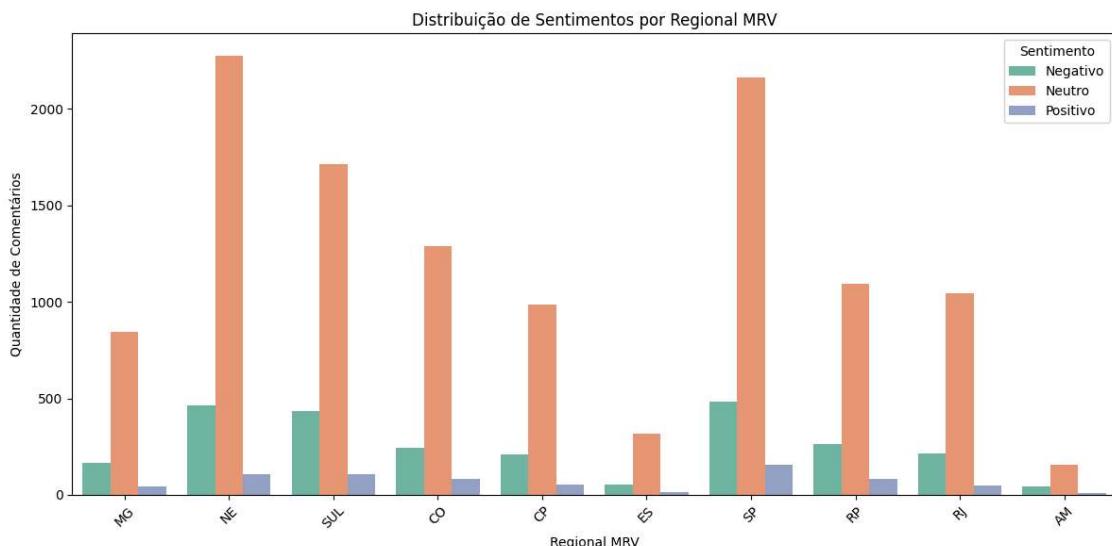
plt.tight_layout()
plt.show()
```



In [9]:

```
import seaborn as sns
import matplotlib.pyplot as plt

plt.figure(figsize=(12, 6))
sns.countplot(data=df, x='Regional MRV', hue='sentimento', palette='Set2')
plt.title('Distribuição de Sentimentos por Regional MRV')
plt.xlabel('Regional MRV')
plt.ylabel('Quantidade de Comentários')
plt.legend(title='Sentimento')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



In [10]:

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

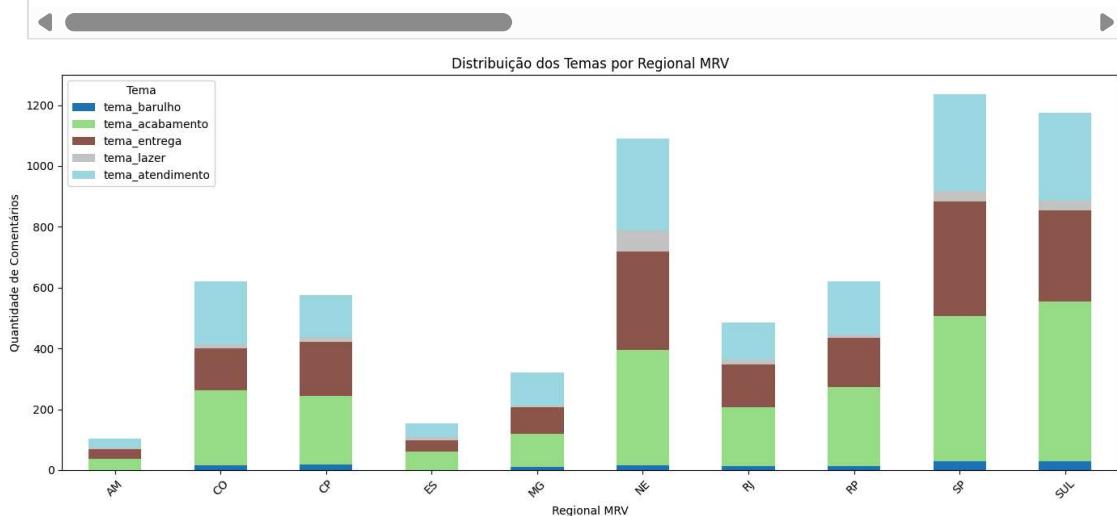
# Recarregar base (caso precise)
df = pd.read_excel(r'C:\Users\andre\OneDrive\Área de Trabalho\Análise de Da
df = df[df['Comentário'].notna()].copy()
df.reset_index(drop=True, inplace=True)
```

```
desafio-processo-seletivo-mrv-2025/analise_sentimentos.ipynb at main · AndreFideles/desafio-processo-seletivo-mrv-2025

# Criar colunas de tema com base em palavras-chave
df['tema_barulho'] = df['Comentário'].str.contains(r'\bbarulho|ru[íi]do|som')
df['tema_acabamento'] = df['Comentário'].str.contains(r'\bacabamento|infilt')
df['tema_entrega'] = df['Comentário'].str.contains(r'\bentrega|prazo|atraso')
df['tema_lazer'] = df['Comentário'].str.contains(r'\bpiscina|playground|chu')
df['tema_atendimento'] = df['Comentário'].str.contains(r'\batendimento|corr')

# Agrupar por regional e contar incidência dos temas
temas_regionais = df.groupby('Regional MRV')[[
    'tema_barulho', 'tema_acabamento', 'tema_entrega', 'tema_lazer', 'tema_atendimento
]].sum().astype(int)

# Plotar gráfico
temas_regionais.plot(kind='bar', stacked=True, figsize=(14, 6), colormap='tab20c')
plt.title('Distribuição dos Temas por Regional MRV')
plt.ylabel('Quantidade de Comentários')
plt.xlabel('Regional MRV')
plt.xticks(rotation=45)
plt.legend(title='Tema')
plt.tight_layout()
plt.show()
```



In [11]:

```
!pip install requests beautifulsoup4 pandas openpyxl
!python scraping_direcional.py
```

```
Requirement already satisfied: requests in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (2.32.3)
Requirement already satisfied: beautifulsoup4 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (4.13.4)
Requirement already satisfied: pandas in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (2.2.3)
Requirement already satisfied: openpyxl in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (3.1.5)
Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from requests) (3.4.2)
Requirement already satisfied: idna<4,>=2.5 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from requests) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from requests) (1.26.20)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from requests) (2025.4.26)
Requirement already satisfied: soupsieve>1.2 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from beautifulsoup4) (2.7)
Requirement already satisfied: typing-extensions>=4.0.0 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from beautifulsoup4) (4.13.2)
```

```
desafio-processo-seletivo-mrv-2025/analise_sentimentos.ipynb at main · AndreFideles/desafio-processo-seletivo-mrv-2025  
Requirement already satisfied: numpy>=1.26.0 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from pandas) (2.2.4)  
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from pandas) (2.9.0.post0)  
Requirement already satisfied: pytz>=2020.1 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from pandas) (2025.2)  
Requirement already satisfied: tzdata>=2022.7 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from pandas) (2025.2)  
Requirement already satisfied: et-xmlfile in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from openpyxl) (2.0.0)  
Requirement already satisfied: six>=1.5 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from python-dateutil>=2.8.2->pandas) (1.17.0)  
Dados salvos em 'direcional_imoveis.xlsx'
```

In [12]: pip install selenium pandas openpyxl

```
Requirement already satisfied: selenium in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (4.32.0)  
Requirement already satisfied: pandas in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (2.2.3)  
Requirement already satisfied: openpyxl in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (3.1.5)  
Requirement already satisfied: urllib3<3,>=1.26 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from urllib3[socks]<3,>=1.26->selenium) (1.26.20)  
Requirement already satisfied: trio~=0.17 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from selenium) (0.30.0)  
Requirement already satisfied: trio-websocket~=0.9 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from selenium) (0.12.2)  
Requirement already satisfied: certifi>=2021.10.8 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from selenium) (2025.4.26)  
Requirement already satisfied: typing_extensions~=4.9 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from selenium) (4.13.2)  
Requirement already satisfied: websocket-client~=1.8 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from selenium) (1.8.0)  
Requirement already satisfied: attrs>=23.2.0 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from trio~=0.17->selenium) (25.3.0)  
Requirement already satisfied: sortedcontainers in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from trio~=0.17->selenium) (2.4.0)  
Requirement already satisfied: idna in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from trio~=0.17->selenium) (3.10)  
Requirement already satisfied: outcome in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from trio~=0.17->selenium) (1.3.0.post0)  
Requirement already satisfied: sniffio>=1.3.0 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from trio~=0.17->selenium) (1.3.1)  
Requirement already satisfied: cffi>=1.14 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from trio~=0.17->selenium) (1.17.1)  
Requirement already satisfied: wsproto>=0.14 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from trio-websocket~=0.9->selenium) (1.2.0)  
Requirement already satisfied: PySocks!=1.5.7,<2.0,>=1.5.6 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from urllib3[socks]<3,>=1.26->selenium) (1.7.1)  
Requirement already satisfied: numpy>=1.26.0 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from pandas) (2.2.4)  
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from pandas) (2.9.0.post0)
```

```
Requirement already satisfied: pytz>=2020.1 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from pandas) (2025.2)
Requirement already satisfied: tzdata>=2022.7 in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from pandas) (2025.2)
Requirement already satisfied: et-xmlfile in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from openpyxl) (2.0.0)
Requirement already satisfied: pycparser in c:\users\andre\appdata\local\programs\python\python313\lib\site-packages (from cffi>=1.14->trio~=0.17->selenium) (2.22)
```