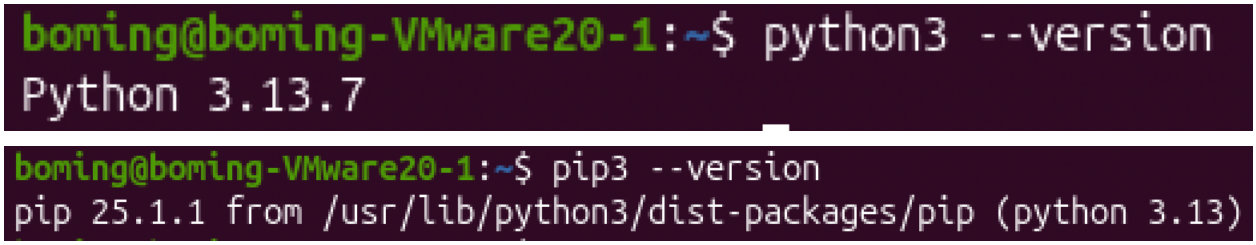
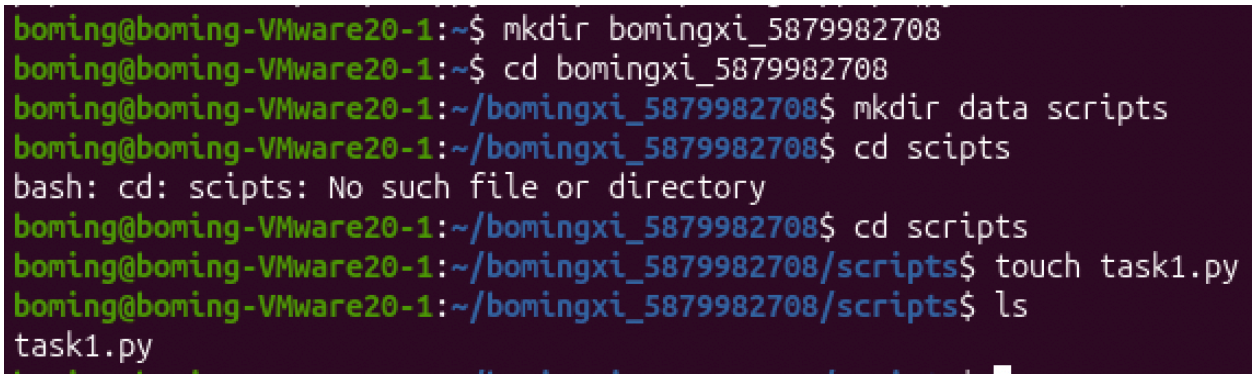
Github Link: https://github.com/boming-xi/DSCI-560
Youtube link: https://www.youtube.com/watch?v=0QQDVMqXodg
Name: Boming Xi
USC ID: 5879982708

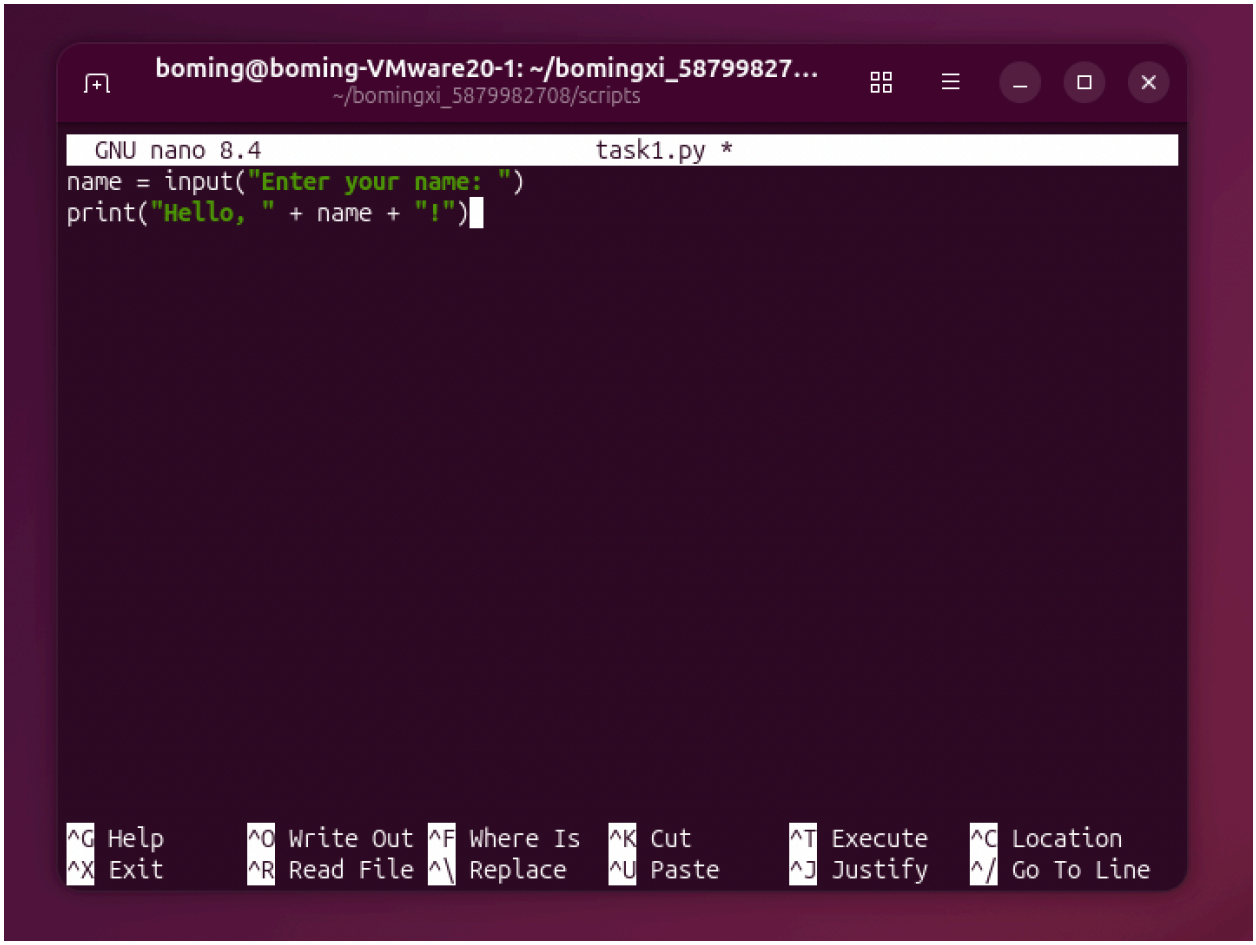
1.3



2.1



2.2

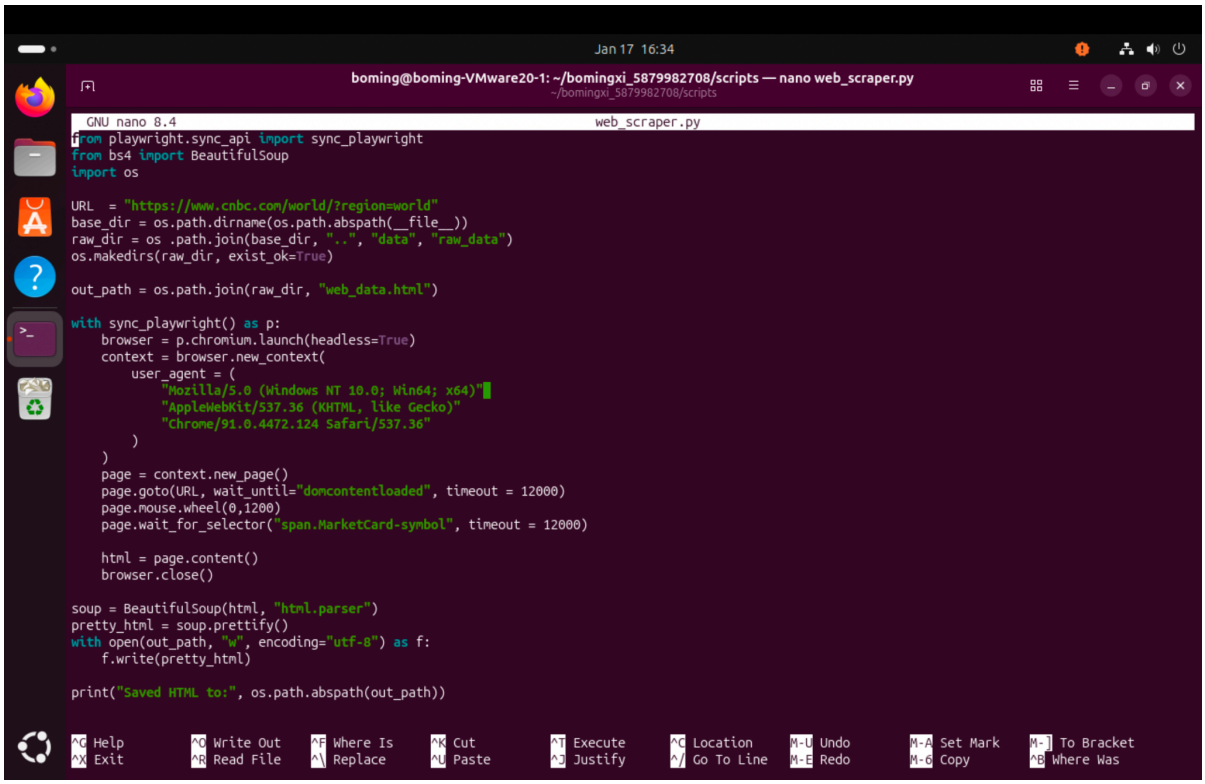


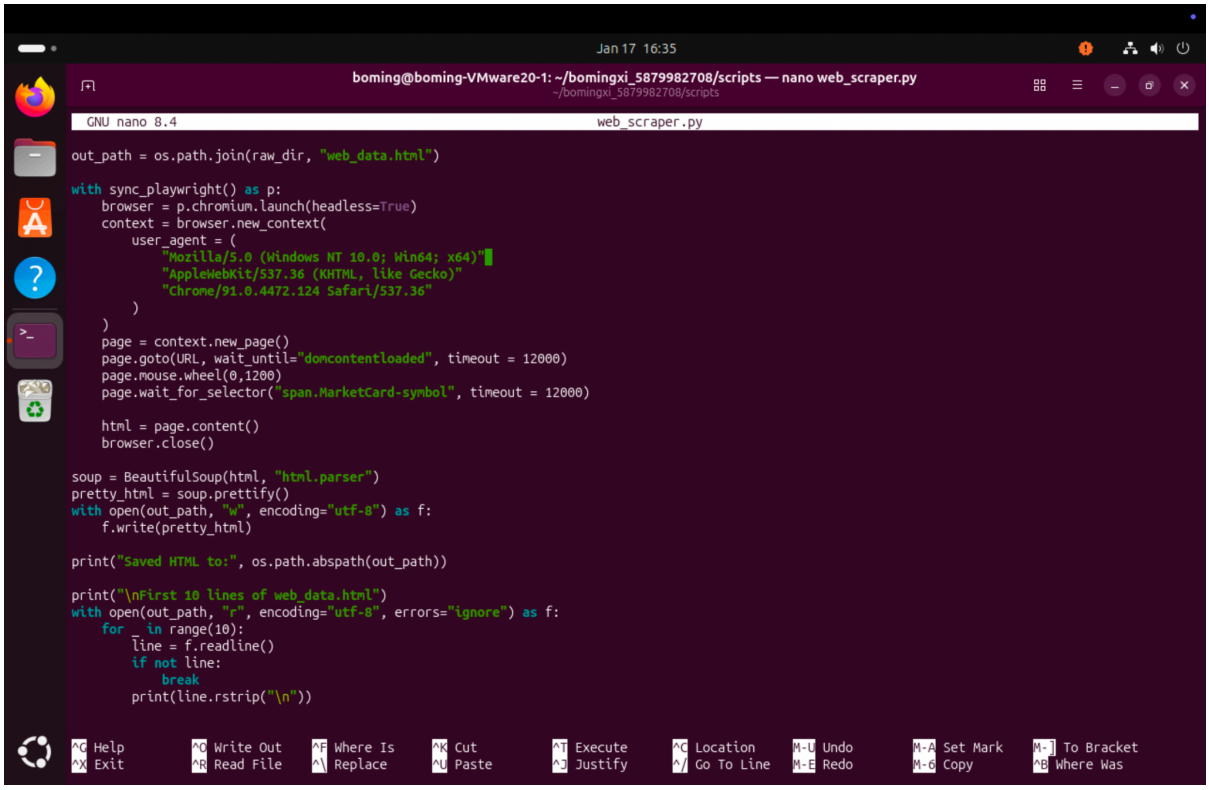

```
boming@boming-VMware20-1:~/bomingxi_5879982708/scripts$ nano task1.py
boming@boming-VMware20-1:~/bomingxi_5879982708/scripts$ python3 task1.py
Enter your name: Boming Xi
Hello, Boming Xi!
```

2.3

```
boming@boming-VMware20-1:~/bomingxi_5879982708/data$ ls
processed_data  raw_data
```

```
boming@boming-VMware20-1:~/bomingxi_5879982708/scripts$ ls
task1.py  web_scraper.py
boming@boming-VMware20-1:~/bomingxi_5879982708/scripts$ ls ..
data  scripts
```


Jan 17 16:34
boming@boming-VMware20-1: ~/bomingxi_5879982708/scripts — nano web_scraper.py
~/bomingxi_5879982708/scripts
GNU nano 8.4 web_scraper.py
from playwright.sync_api import sync_playwright
from bs4 import BeautifulSoup
import os
URL = "https://www.cnbc.com/world/?region=world"
base_dir = os.path.dirname(os.path.abspath(__file__))
raw_dir = os .path.join(base_dir, "..", "data", "raw_data")
os.makedirs(raw_dir, exist_ok=True)
out_path = os.path.join(raw_dir, "web_data.html")
with sync_playwright() as p:
browser = p.chromium.launch(headless=True)
context = browser.new_context(
user_agent = (
"Mozilla/5.0 (Windows NT 10.0; Win64; x64)"
"AppleWebKit/537.36 (KHTML, like Gecko)"
"Chrome/91.0.4472.124 Safari/537.36"
)
)
page = context.new_page()
page.goto(URL, wait_until="domcontentloaded", timeout = 12000)
page.mouse.wheel(0,1200)
page.wait_for_selector("span.MarketCard-symbol", timeout = 12000)
html = page.content()
browser.close()
soup = BeautifulSoup(html, "html.parser")
pretty_html = soup.prettify()
with open(out_path, "w", encoding="utf-8") as f:
f.write(pretty_html)
print("Saved HTML to:", os.path.abspath(out_path))
^G Help ^O Write Out ^F Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark M-] To Bracket
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy ^B Where Was

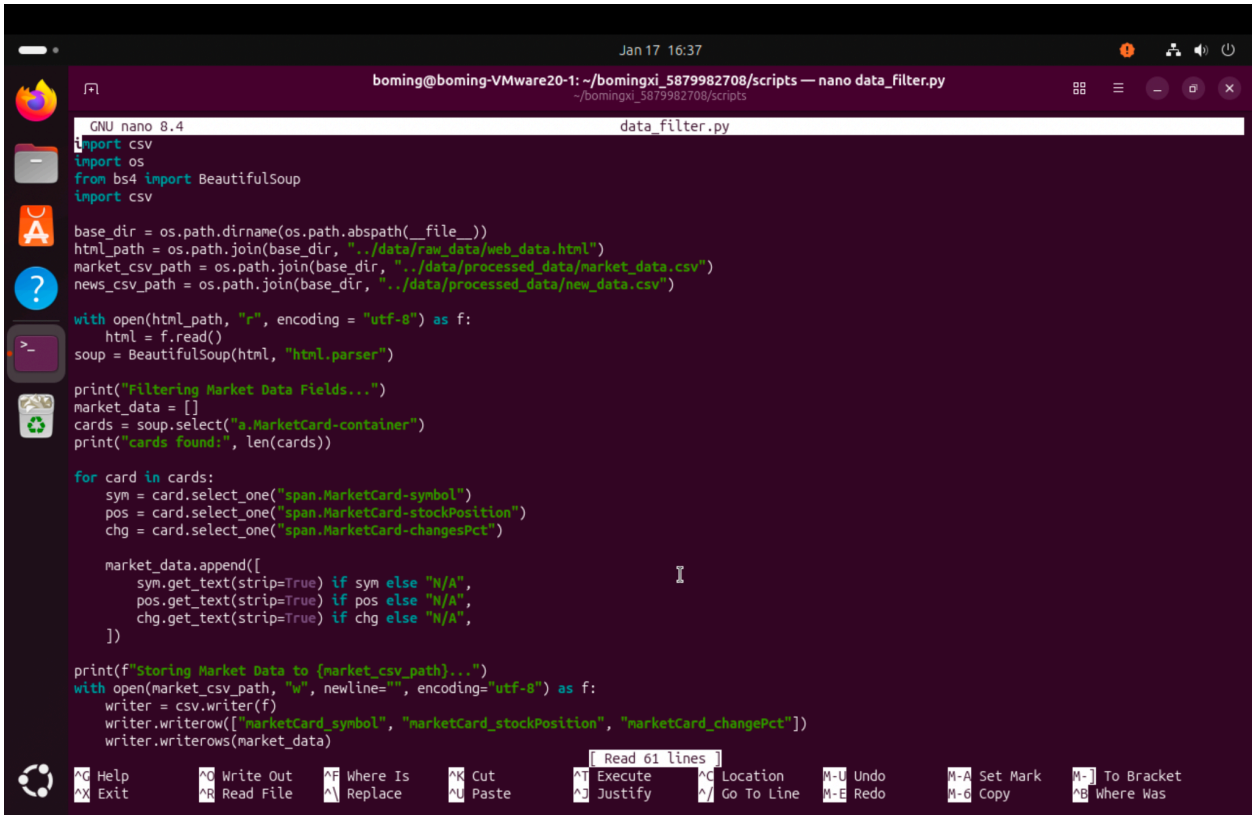

Jan 17 16:35
boming@boming-VMware20-1: ~/bomingxi_5879982708/scripts — nano web_scraper.py
~/bomingxi_5879982708/scripts
GNU nano 8.4 web_scraper.py
out_path = os.path.join(raw_dir, "web_data.html")
with sync_playwright() as p:
browser = p.chromium.launch(headless=True)
context = browser.new_context(
user_agent = (
"Mozilla/5.0 (Windows NT 10.0; Win64; x64)"
"AppleWebKit/537.36 (KHTML, like Gecko)"
"Chrome/91.0.4472.124 Safari/537.36"
)
)
page = context.new_page()
page.goto(URL, wait_until="domcontentloaded", timeout = 12000)
page.mouse.wheel(0,1200)
page.wait_for_selector("span.MarketCard-symbol", timeout = 12000)
html = page.content()
browser.close()
soup = BeautifulSoup(html, "html.parser")
pretty_html = soup.prettify()
with open(out_path, "w", encoding="utf-8") as f:
f.write(pretty_html)
print("Saved HTML to:", os.path.abspath(out_path))
print("\nFirst 10 lines of web_data.html")
with open(out_path, "r", encoding="utf-8", errors="ignore") as f:
for _ in range(10):
line = f.readline()
if not line:
break
print(line.rstrip("\n"))
^G Help ^O Write Out ^F Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark M-] To Bracket
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy ^B Where Was

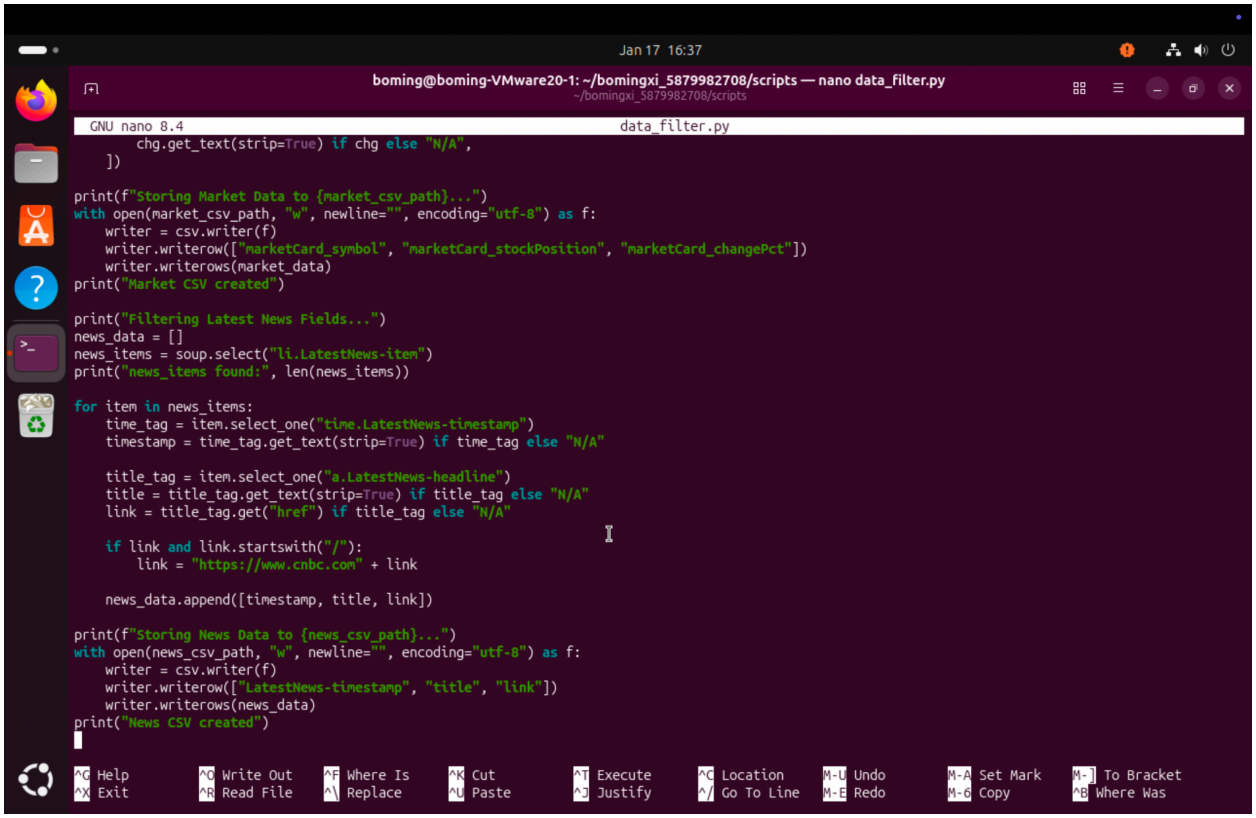
```
(.venv) boming@boming-VMware20-1:~/bomingxi_5879982708/scripts$ python web_scraper.py
Saved HTML to: /home/boming/bomingxi_5879982708/data/raw_data/web_data.html

First 10 lines of web_data.html
<!DOCTYPE html>
<html itemscope="" itemtype="https://schema.org/WebPage" lang="en" prefix="og=https://ogp.me/ns#">
 <head>
  <meta content="A7vZI3v+Gz7JfuRolKNM4Aff6zaGuT7X0mf3wtoZTnKv6497cVMnhy03KDqX7kBz/q/iidW7srW31oQbBt4VhgoAAACUeyJvcmln
aW4iOiJodHRwczovL3d3dy5nb29nbGUuY29tOjQ0MyIsImZlYXR1cmUiOiJEaXNhYmxlVGhpcmRQYXJ0eVN0b3JhZ2VQYXJ0aXRpb25pbmczIiwiZXhwa
XJ5IjoxNzU3OTgwODAwLCJpc1N1YmRvbWFpbiI6dHJ1ZSwiaXNUaGlyZFBhcnR5Ijp0cnVlfQ==" http-equiv="origin-trial"/>
  <noscript>
  </noscript>
  <script async="" src="https://cdn.cxense.com/cx.cce.js" type="text/javascript">
  </script>
  <script async="" data-jsonpid="" src="https://cdn-gl.imrworldwide.com/novms/js/2/nlsSDK600.bundle.min.js">
  </script>
```

Write a Python web scraper (web_scraper.py) that uses **Playwright** to open CNBC's World page in a real headless Chromium browser, waits for dynamic market elements to load, then grabs the fully rendered HTML. Then use **BeautifulSoup** to prettify/format that HTML, save it to data/raw_data/web_data.html, and print the saved path and the first 10 lines.

2.4






```
(.venv) boming@boming-VMware20-1:~/bomingxi_5879982708/scripts$ python data_filter.py
Filtering Market Data Fields...
cards found: 5
Storing Market Data to /home/boming/bomingxi_5879982708/scripts/../data/processed_data/market_data.csv...
Market CSV created
Filtering Latest News Fields...
news_items found: 30
Storing News Data to /home/boming/bomingxi_5879982708/scripts/../data/processed_data/new_data.csv...
News CSV created
```

Write and run data_filter.py to **parse the saved CNBC HTML (data/raw_data/web_data.html) with BeautifulSoup**, extract two datasets—**market card fields** (symbol, stock position, percent change) and **latest news fields** (timestamp, headline, link)—handle missing values with "N/A" and convert relative links to full CNBC URLs, then **export the cleaned results into CSV files**: data/processed_data/market_data.csv and data/processed_data/new_data.csv.

Open ~/bomingxi_5879982708/data/processed_data **new_data.csv**

market_data.csv | new_data.csv | data_filter.py | task1.py

```
LatestNews-timestamp,title,link
5 Hours Ago,Week in review: Stocks battled a flood of news and we booked some profits,https://
www.cnbc.com/2026/01/17/week-in-review-stocks-battled-a-flood-of-news-and-we-booked-some-
profits.html
6 Hours Ago,Trump threatens to sue JPMorgan Chase for ‘debanking’ him,https://www.cnbc.com/
2026/01/17/trump-jpmorgan-chase-debanking.html
8 Hours Ago,Trump: NATO members to face tariffs up to 25% until a Greenland deal is
struck,https://www.cnbc.com/2026/01/17/trump-greenland-tariffs-nato.html
9 Hours Ago,"Led by Texas, states race to prove they can put bitcoin on public balance
sheet",https://www.cnbc.com/2026/01/17/texas-us-states-budgets-bitcoin-crypto-strategic-
reserve.html
10 Hours Ago,Unshaken: Why Brazilian stocks have looked past the Venezuela attack,https://
www.cnbc.com/2026/01/17/unshaken-why-brazilian-stocks-have-looked-past-the-venezuela-attack.html
10 Hours Ago,Bestselling author: How to create better habits without relying on
discipline,https://www.cnbc.com/2026/01/17/james-clear-how-to-create-better-habits-without-
relying-on-discipline.html
10 Hours Ago,"Warren Buffett: To maximize your potential, ask yourself this question",https://
www.cnbc.com/2026/01/17/warren-buffett-to-maximize-your-potential-ask-yourself-this-question.html
11 Hours Ago,"Buy these five stocks ahead of earnings, Bank of America says",https://
www.cnbc.com/2026/01/17/stocks-to-buy-ahead-of-earnings-bank-of-america-says.html
11 Hours Ago,This week’s most overbought names include Darden Restaurants and Target,https://
www.cnbc.com/2026/01/17/this-weeks-most-overbought-names-include-darden-restaurants-and-
target.html
11 Hours Ago,"Buffett on parenting, giving up horse betting and why he stopped talking
politics",https://www.cnbc.com/2026/01/17/warren-buffett-on-parenting-horse-betting-and-why-he-
stopped-talking-politics.html
```

Open ~/bomingxi_5879982708/data/processed_data **market_data.csv**

market_data.csv | new_data.csv | data_filter.py | task1.py

```
marketCard_symbol,marketCard_stockPosition,marketCard_changePct
STOXX600*,614.38,-0.03%
DAX*,"25,297.13",-0.22%
FTSE*,"10,235.29",-0.04%
CAC*,"8,258.94",-0.65%
FTSE MIB*,"45,799.69",-0.11%
```