

DSCI 560 Lab 1

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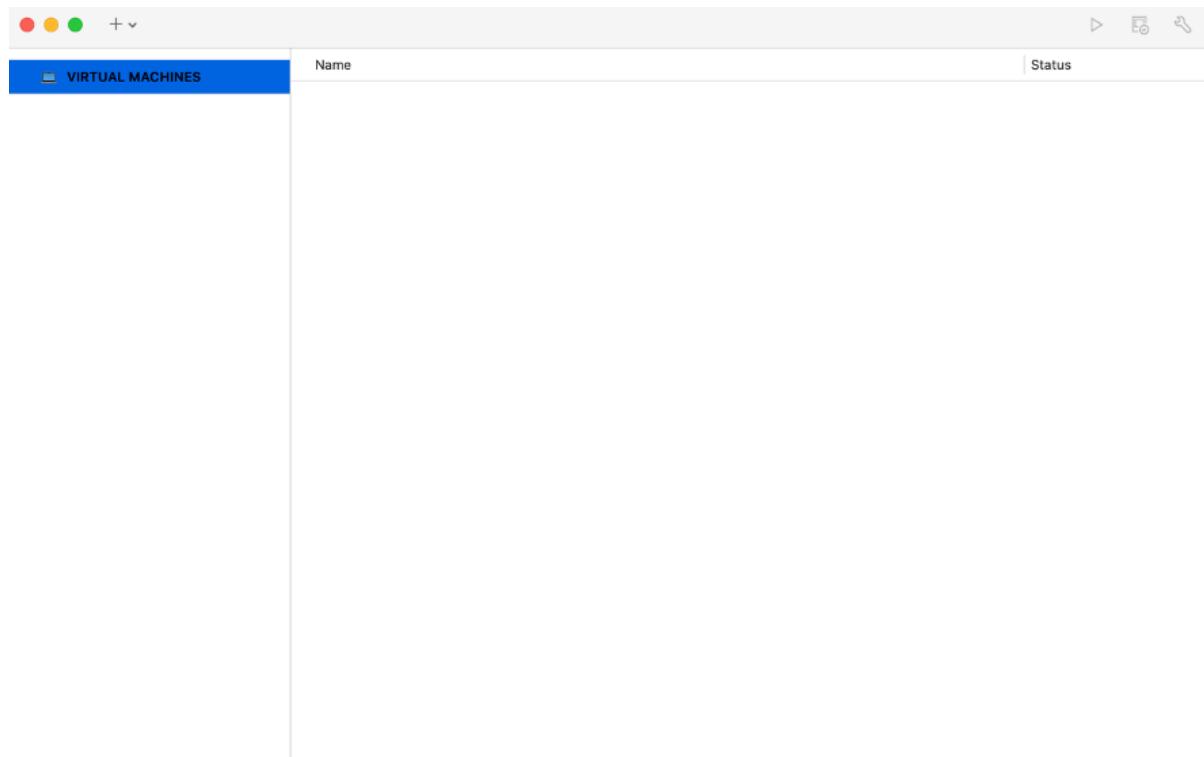
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<https://github.com/YUNBLAK/usc-dsci560-sp26>

1. Installation and Setup

I registered at Broadcom and then downloaded and installed Vmware. And I downloaded Ubuntu ISO Image (ARM) because I am using an Apple silicon Mac (m1). If I try to use the standard version, it does not work.

1.1. Register at Broadcom and then download and install VMware



1.2. Download Ubuntu ISO Image



1.3. Install Python on Linux

I opened a terminal in my ubuntu virtual machine. First of all, I updated the packages list using: **sudo apt update**.

```
(base) daniel@daniel-AORUS-17H-BXF:~$ sudo apt update
[sudo] daniel 암호:
받기:1 https://dl.google.com/linux/chrome/deb stable InRelease [1,825 B]
받기:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
받기:3 https://dl.google.com/linux/chrome/deb/stable/main amd64 Packages [1,212 B]
받기:4 https://packages.microsoft.com/repos/code stable InRelease [3,590 B]
기준:5 http://us.archive.ubuntu.com/ubuntu jammy InRelease
받기:6 https://packages.microsoft.com/repos/code/stable/main amd64 Packages [20.7 kB]
받기:7 http://us.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
```

I verified that Python 3 is installed successfully.

```
(base) daniel@daniel-AORUS-17H-BXF:~$ python3 --version
Python 3.13.5
```

Moreover, I verified that pip is installed successfully.

```
(base) daniel@daniel-AORUS-17H-BXF:~$ pip3 --version
pip 25.1 from /home/daniel/anaconda3/lib/python3.13/site-packages/pip (python 3.13)
```

2. Get Familiar with Linux and Python

2.1. Playing around with Linux Terminal

I opened the Linux terminal and created a new directory named daniel_4463771151. Inside this folder, there are two subdirectories named "data" and "scripts". I created an empty Python file inside the scripts folder named "task_1.py".

```
(base) daniel@daniel-AORUS-17H-BXF:~$ mkdir daniel_4463771151
(base) daniel@daniel-AORUS-17H-BXF:~$ cd daniel_4463771151/
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ mkdir data
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ mkdir scripts
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ touch scripts/task_1.py
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ ls
data  scripts

(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ cd scripts/
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/scripts$ ls
task_1.py
```

I use the list command "ls" to view the created script file.

2.2. A basic Python Script

By using nano I opened the task_1.py Python file I'd created. I wrote a simple Python script that reads a name as input and says hello.

```
GNU nano 6.2                                task_1.py
name = input("Enter your name: ")
print(f"Hello, {name}!")
```

I saved and ran the Python code.

```
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/scripts$ nano task_1.py
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/scripts$ python3 task_1.py
Enter your name: Daniel Yun
Hello, Daniel Yun!
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/scripts$
```

2.3. Python Web-scraping Task

I created a new file named “web_scraper.py” in the scripts folder.

```
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/scripts$ touch web_scraper.py
```

Install the required libraries (Requests and BeautifulSoup4) using pip

```
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/scripts$ pip install requests beautifulsoup4
Requirement already satisfied: requests in /home/daniel/anaconda3/lib/python3.13/site-packages (2.32
.3)
Requirement already satisfied: beautifulsoup4 in /home/daniel/anaconda3/lib/python3.13/site-packages
(4.12.3)
Requirement already satisfied: charset-normalizer<4,>=2 in /home/daniel/anaconda3/lib/python3.13/site-
packages (from requests) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /home/daniel/anaconda3/lib/python3.13/site-packages
(from requests) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in /home/daniel/anaconda3/lib/python3.13/site-pack
ages (from requests) (2.3.0)
Requirement already satisfied: certifi>=2017.4.17 in /home/daniel/anaconda3/lib/python3.13/site-pack
ages (from requests) (2025.4.26)
Requirement already satisfied: soupsieve>1.2 in /home/daniel/anaconda3/lib/python3.13/site-packages
(from beautifulsoup4) (2.5)
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/scripts$
```

I opened this website <https://www.cnbc.com/world/?region=world>. And I tried to analyze the HTML structure on the Page.

The screenshot shows the CNBC homepage with a focus on the 'MARKETS' section. Below the navigation bar, there's a grid of market cards. Each card displays a symbol, current value, change, percentage change, and last update time. The symbols shown are STOXX600*, DAX*, FTSE*, CAC*, and FTSE MIB*. The values range from 614.38 to 45,799.69. The percentage changes range from -0.03% to -0.65%. The last update times are listed as 'LAST | 1/16/26 GMT'. Below the grid, a headline reads 'European stocks finish lower as Greenland remains in focus; gold and silver prices dip'. A code editor overlay is visible at the bottom, showing the HTML structure of one of the market cards. The code highlights the class 'MarketCard-row' and its contents, including spans for symbols and values, and a link to a specific quote page for DAXI.

```
*** <div class="MarketCard-row"> (flex) == $0
    <span class="MarketCard-symbol">STOXX600*</span>
    <span class="MarketCard-stockPosition">614.38</span>
</div>
▶ <div class="MarketCard-row"> (flex)
▶ <div class="MarketCard-row"> (flex)
</a>
▶ <a href="//www.cnbc.com/quotes/.GDAXI" class="MarketCard-c
ontainer MarketCard-down"> (flex)
```

I created two new folders called “raw_data” and “processed_data” in “data” folder
I wrote a Python script that uses Requests and BeautifulSoup to collect data from the link.

```
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ ls
data scripts
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ mkdir -p data/raw_data data/processed_data
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ ls
data scripts
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ cd data
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/data$ ls
processed_data raw_data
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/data$ pwd
/home/daniel/daniel_4463771151/data
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/data$
```

My script saves the collected data.

```
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ python3 scripts/web_scraper.py
Saved: data/raw_data/web_data.html
```

By using the terminal, I printed the first 10 lines of the created html file.

```
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ python3 scripts/web_scraper.py
Saved: data/raw_data/web_data.html
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ head -n 10 data/raw_data/web_data.html
<section class="MarketsBanner-container" data-analytics="HomePageInternational-marketsBanner-1-0" data-test="marketsBanner-0" id="HomePageInternational-MarketsBanner-1">
  <div class="MarketsBannerMenu-marketBannerWrapper">
    <div class="CustomBannerAdder-container">
      <button aria-label="Add markets banner" class="CustomBannerAdder-addButton" data-testid="addButton">
        <span aria-hidden="true" class="CustomBannerAdder-plusButton" data-testid="plusButton">
          <svg data-analytic-id="plus-icon" fill="none" height="17" viewBox="0 0 17 17" width="17" xmlns="http://www.w3.org/2000/svg">
            <path clip-rule="evenodd" d="M9.1427 7.43729L9.18188 1.1331C9.18391 0.807363 8.92149 0.544946 8.59576 0.546971C8.27003 0.548995 8.00433 0.814694 8.0023 1.14043L7.96312 7.44462L1.46316 7.48502C1.13743 7.48704 0.871726 7.75274 0.869702 8.07847C0.867677 8.40421 1.13009 8.666662 1.45583 8.6646L7.95579 8.6242L7.91539 15.1242C7.91337 15.4499 8.17579 15.7123 8.50152 15.7103C8.82725 15.7083 9.09295 15.4426 9.09497 15.1168L9.13537 8.61687L15.4396 8.57769C15.7653 8.57566 16.031 8.30997 16.033 7.98423C16.035 7.6585 15.7726 7.39608 15.4469 7.39811L9.1427 7.43729Z" fill="#005594" fill-rule="evenodd">
            </path>
          </svg>
        </span>
      </button>
    </div>
  </div>
</section>
```

2.4. Data Filtering Task

I wrote a python script called "data_filter.py" reading the "web_data.html" file into a for extracting data.

```
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$ python3 scripts/data_filter.py
Reading HTML ...
Filtering fields ...
Storing Market data ...
CSV created: data/processed_data/market_data.csv rows= 5
Storing News data ...
CSV created: data/processed_data/news_data.csv rows= 30
Done.
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151$
```

My script stores the (marketCard_symbol, marketCard_stockPosition and marketCard-changePct) from the market banner and the (LatestNews-timestamp, title and link).

market_data.csv:

```
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/data/processed_data$ cat market_data.csv
symbol,stock_position,change
STOXX600*,614.38,-0.19
DAX*,25297.13,-55.26
FTSE*,10235.29,-3.65
CAC*,8258.94,-54.18
FTSE MIB*,45799.69,-50.08
```

news_data.csv

```
(base) daniel@daniel-AORUS-17H-BXF:~/daniel_4463771151/data/processed_data$ cat news_data.csv
timestamp,title,link
11 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
12 Hours Ago,Trump threatens to sue JPMorgan Chase for 'debunking' him,https://www.cnbc.com/2026/01/17/trump-jpmorgan-chase-debanking.html
14 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
15 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
17 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
17 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
17 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
17 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
17 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
17 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-politics.html
17 Hours Ago,"Unexpected expenses take 10% of retirees' income, on average, research shows",https://www.cnbc.com/2026/01/17/retirees-emergency-savings.html
18 Hours Ago,Disney dominated the 2025 box office. Here's how it could keep the crown in 2026,https://www.cnbc.com/2026/01/17/disney-dominated-2025-box-office
21 Hours Ago,The founders of billion-dollar AI startups are getting younger – here's why,https://www.cnbc.com/2026/01/17/billion-dollar-ai-startup-founders-are-getting-younger
"January 16, 2026",Elon Musk's XAI faces tougher road building data centers after EPA rule update,https://www.cnbc.com/2026/01/16/musks-xai-faces-tougher-road-building-data-centers-after-epa-rule-update
"January 16, 2026",Here's why Jim Cramer thinks chip stocks can go higher,https://www.cnbc.com/2026/01/16/heres-why-jim-cramer-thinks-chip-stocks-can-go-higher
```

3. Team Formation

Done!