



Python Training(코딩 실습)

FOR BEGGINERS



Contents

1. replit 가입 및 실행
2. 코드 작성

01

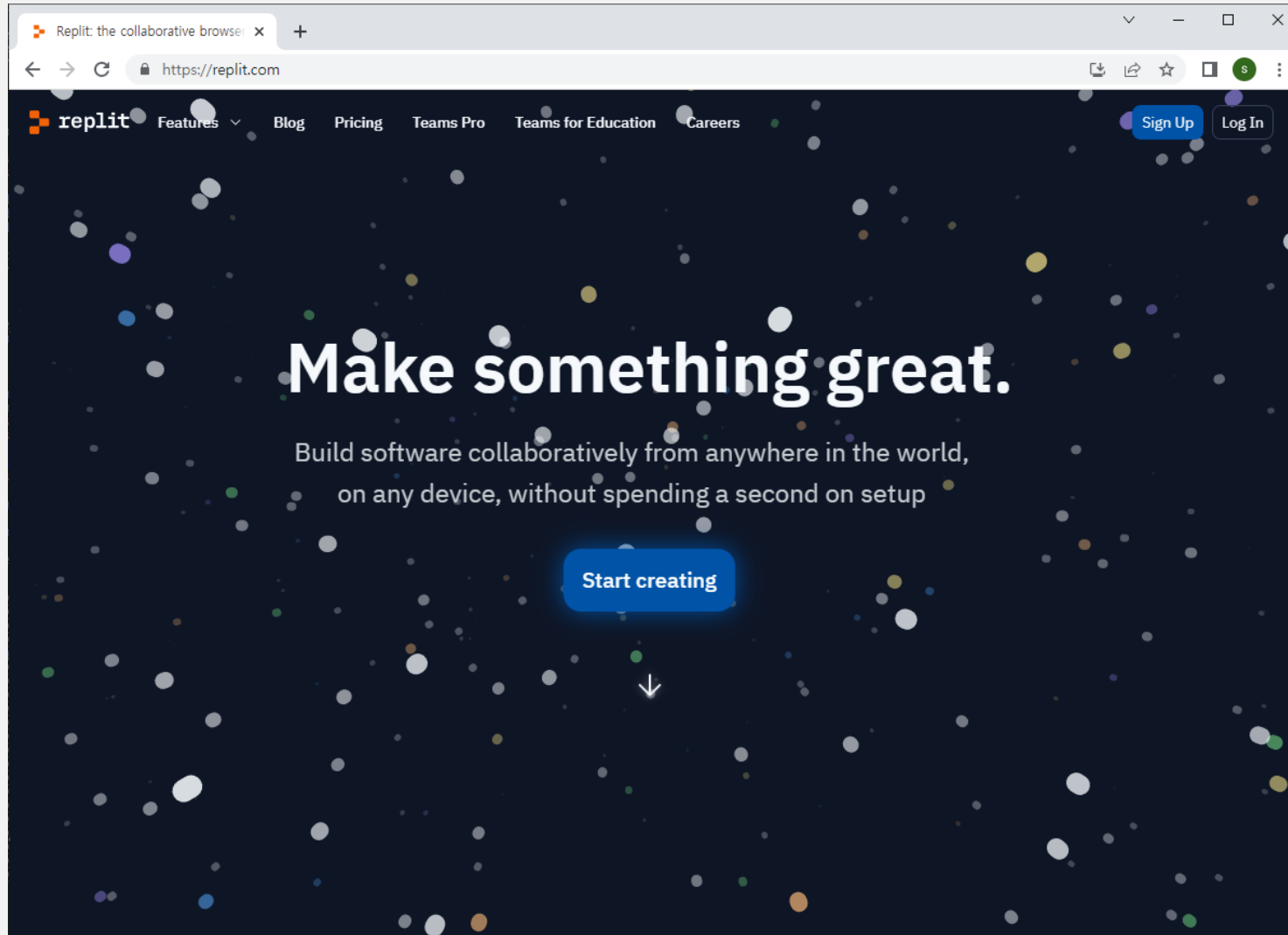
Chapter

Python installation

replit 가입 및 실행



replit



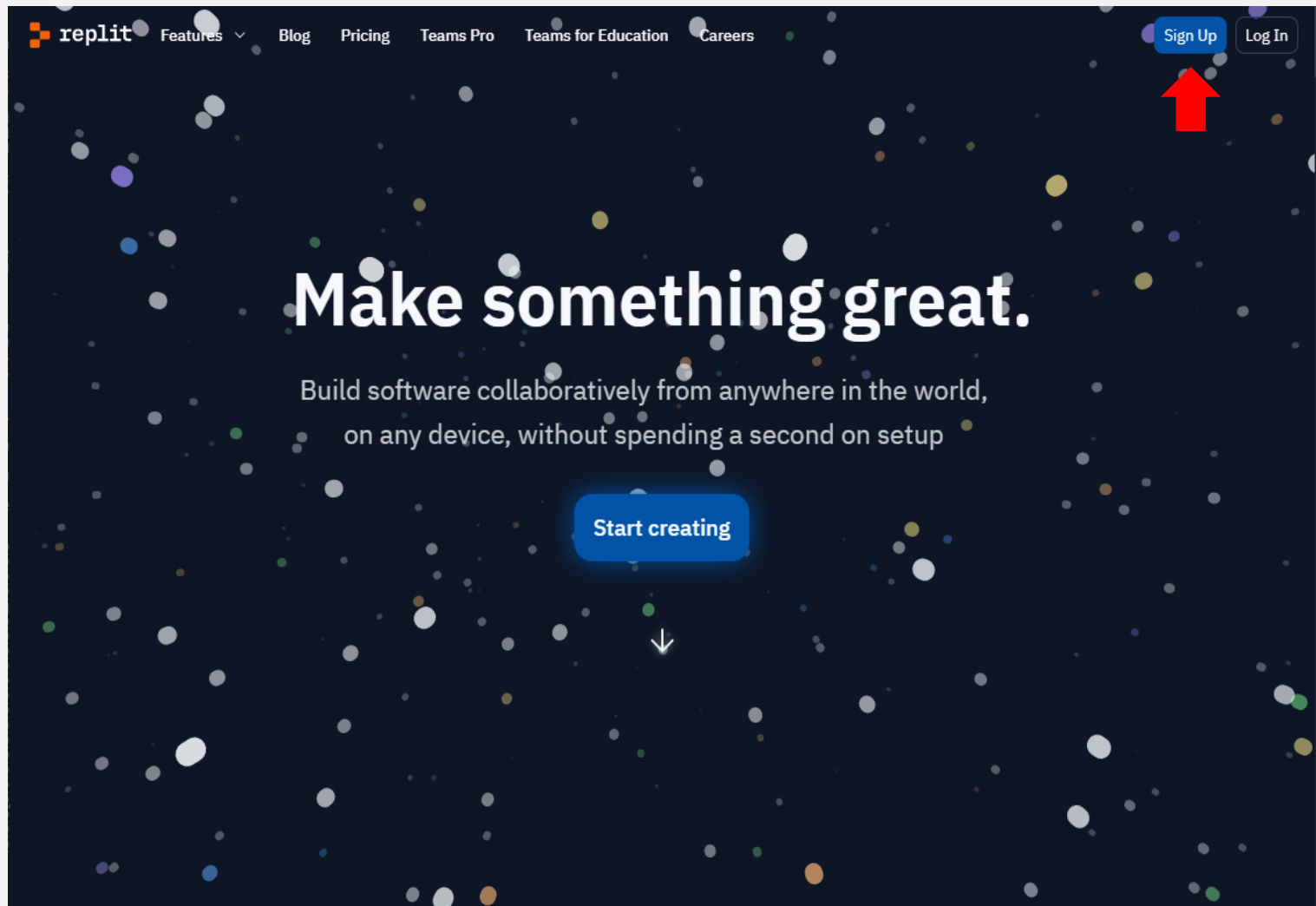
replit

- 클라우드 기반 프로그래밍 환경
- 개발환경 세팅 없이 회원가입만 하면 사용 가능

<https://replit.com/>



replit 회원가입




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replit 실행

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See what you can accomplish on Replit

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replit 실행

The screenshot shows the Replit website interface. A modal titled "Create a Repl" is open in the center. The modal has two main sections: "Template" and "Title".

- Template:** Contains a search bar labeled "Search Templates" and a list of templates. The "Python" template is highlighted with a red box. Other templates include "Node.js", "C", "HTML, CSS, JS", and "Python (with Turtle)".
- Title:** Contains a text input field labeled "Name your Repl".
- Public/Private:** A section with a "Public" radio button and the text "Anyone can view and fork this Repl." Below this is a "Power Up to make private" button.
- Create Repl:** A blue button with a "+" icon and the text "Create Repl" is highlighted with a red box.

The background of the website shows a sidebar with navigation links like "Home", "Templates", "My Repls", "My Cycles", "Community", "Bounties", "Learn", "Teams", and "Curriculum". The main content area has a header with "Search & run commands" and a large banner for "@bitnara, your AI pair programmer is waiting for you."



네트워크 장비를 위한 라이브러리

Paramiko

paramiko 2.12.0

`pip install paramiko`

✓ [Latest version](#)

Released: Nov 5, 2022

SSH2 protocol library

Navigation

[Project description](#)

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Project links

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Statistics

Project description

`py` `2.12.0` `python` `2.7` `3.4` `3.5` `3.6` `3.7` `3.8` `3.9` `license` `LGPL` `build` `passing` `coverage` `78%`

Welcome to Paramiko!

Paramiko is a pure-Python [\[1\]](#) (2.7, 3.4+) implementation of the SSHv2 protocol [\[2\]](#), providing both client and server functionality. It provides the foundation for the high-level SSH library [Fabric](#), which is what we recommend you use for common client use-cases such as running remote shell commands or transferring files.

Direct use of Paramiko itself is only intended for users who need advanced/low-level primitives or want to run an in-Python sshd.

For installation information, changelogs, FAQs and similar, please visit [our main project website](#); for API details, see [the versioned docs](#). Additionally, the project maintainer keeps a [roadmap](#) on his personal site.

[\[1\]](#) Paramiko relies on [cryptography](#) for crypto functionality, which makes use of C and Rust extensions but has many precompiled options available. See [our installation page](#) for details.

[\[2\]](#) SSH is defined in [RFC 4251](#), [RFC 4252](#), [RFC 4253](#) and [RFC 4254](#). The primary working implementation of the protocol is the [OpenSSH project](#). Paramiko implements a large portion of the SSH feature set, but there are occasional gaps.



네트워크 장비를 위한 라이브러리

Netmiko

netmiko 4.1.2

✓

Latest version

`pip install netmiko`

Released: Aug 10, 2022

Multi-vendor library to simplify legacy CLI connections to network devices

Navigation

Project description

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Homepage

Statistics

GitHub statistics:

★ Stars: 2969

🔗 Forks: 1121

📄 Open issues/PRs: 241

View statistics for this project via [Libraries.io](#), or by using [our public dataset on Google BigQuery](#)

Project description

python 3.7 | 3.8 | 3.9 | 3.10

pypi v4.1.2

downloads 5M

contributors 160

code style black

NETMIKO

Netmiko

Multi-vendor library to simplify CLI connections to network devices

Why Netmiko?

Network automation to screen-scraping devices is primarily concerned with gathering output from show commands and with making configuration changes.

Netmiko aims to accomplish both of these operations and to do it across a very broad set of platforms. It seeks to do this while abstracting away low-level state control (i.e. eliminate low-level regex pattern matching to the extent practical).



네트워크 장비를 위한 라이브러리

scrapli

scrapli 2022.7.30.post1



`pip install scrapli`

Released: Sep 4, 2022

Fast, flexible, sync/async, Python 3.7+ screen scraping client specifically for network devices

Navigation

Project description

Release history

Download files

Project links

Homepage

Changelog

Docs

Statistics

GitHub statistics:

★ Stars: 462

🔗 Forks: 45

📢 Open issues/PRs: 1

Project description



python 3.7 | 3.8 | 3.9 | 3.10

pypi package 2022.7.30.post1

Weekly Build passing

codecov 91%

code style black

License MIT

scrapli

Documentation: <https://carlmontanari.github.io/scrapli>

Source Code: <https://github.com/carlmontanari/scrapli>

Examples: <https://github.com/carlmontanari/scrapli/tree/master/examples>

scrapli -- scrap(e)li -- is a python 3.7+ library focused on connecting to devices, specifically network devices (routers/switches/firewalls/etc.) via Telnet or SSH.

Key Features:

- **Easy:** It's easy to get going with scrapli -- check out the documentation and example links above, and you'll be connecting to devices in no time.
- **Fast:** Do you like to go fast? Of course you do! All of scrapli is built with speed in mind, but if you really feel the need for speed, check out the `ssh2` transport plugin to take it to the next level!



네트워크 장비를 위한 라이브러리

Pyntc

pyntc 0.20.3

✓ Latest version

`pip install pyntc`

Released: Oct 28, 2020


SDK to simplify common workflows for Network Devices.

Navigation

- Project description
- Release history
- Download files

Project description

Pyntc



CI passing docs passing pypi v0.20.3 downloads 764/month

Overview

A Python library that is a SDK to simplify common workflows for Network Devices.

Documentation

Full web-based HTML documentation for this library can be found over on the [Pyntc Docs](#) website:

Project links

- Homepage
- Documentation
- Repository

Statistics

GitHub statistics:

- ★ Stars: 156
- 🔗 Forks: 51
- 📢 Open issues/PRs: 15



네트워크 장비를 위한 라이브러리

ncclient

ncclient 0.6.13

`pip install ncclient`



✓ Latest version

Released: Apr 11, 2022

Python library for NETCONF clients

Navigation

☰ Project description

🕒 Release history

📄 Download files

Project links

🏠 Homepage

Statistics

GitHub statistics:

★ Stars: 582

👤 Forks: 370

🔔 Open issues/PRs: 58

View statistics for this project via

Project description

ncclient is a Python library that facilitates client-side scripting and application development around the NETCONF protocol. `ncclient` was developed by Shikar Bhushan <<http://schmizz.net>>. It is now maintained by Leonidas Pouloupoulos (@leopoul) <<http://ncclient.org>> and Einar Nilsen-Nygaard (@einarnn).

Docs: <http://ncclient.readthedocs.org>

Github: <https://github.com/ncclient/ncclient>

Requirements:

- Python 2.7 or Python 3.4+
- setuptools 0.6+
- Paramiko 1.7+
- lxml 3.3.0+
- libxml2
- libxslt

If you are on Debian/Ubuntu install the following libs (via aptitude or apt-get):

- libxml2-dev
- libxslt1-dev



네트워크 장비를 위한 라이브러리

textfsm

textfsm 1.1.3

`pip install textfsm`



✓ Latest version

Released: Jul 6, 2022

Python module for parsing semi-structured text into python tables.

Navigation

Project description

Release history

Download files

Project links

Homepage

Statistics

GitHub statistics:

★ Stars: 979

🔗 Forks: 170

Project description

TextFSM

Python module which implements a template based state machine for parsing semi-formatted text. Originally developed to allow programmatic access to information returned from the command line interface (CLI) of networking devices.

The engine takes two inputs - a template file, and text input (such as command responses from the CLI of a device) and returns a list of records that contains the data parsed from the text.

A template file is needed for each uniquely structured text input. Some examples are provided with the code and users are encouraged to develop their own.

By developing a pool of template files, scripts can call TextFSM to parse useful information from a variety of sources. It is also possible to use different templates on the same data in order to create different tables (or views).

TextFSM was developed internally at Google and released under the Apache 2.0 licence for the benefit of the wider community.

[See documentation for more details.](#)

02


Chapter

Create functions

코드 작성



Netmiko



[Help](#) [Sponsors](#) [Log in](#) [Register](#)

netmiko 4.1.2

`pip install netmiko`

 [Latest version](#)

Released: Aug 10, 2022

Multi-vendor library to simplify legacy CLI connections to network devices

Navigation

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[Release history](#)

[Download files](#)

Project links

[Homepage](#)

Statistics

GitHub statistics:

 **Stars:** 2962

 **Forks:** 1120

Project description

python 3.7 | 3.8 | 3.9 | 3.10 pypi v4.1.2 downloads 5M contributors 160 code style black



Netmiko

Multi-vendor library to simplify CLI connections to network devices

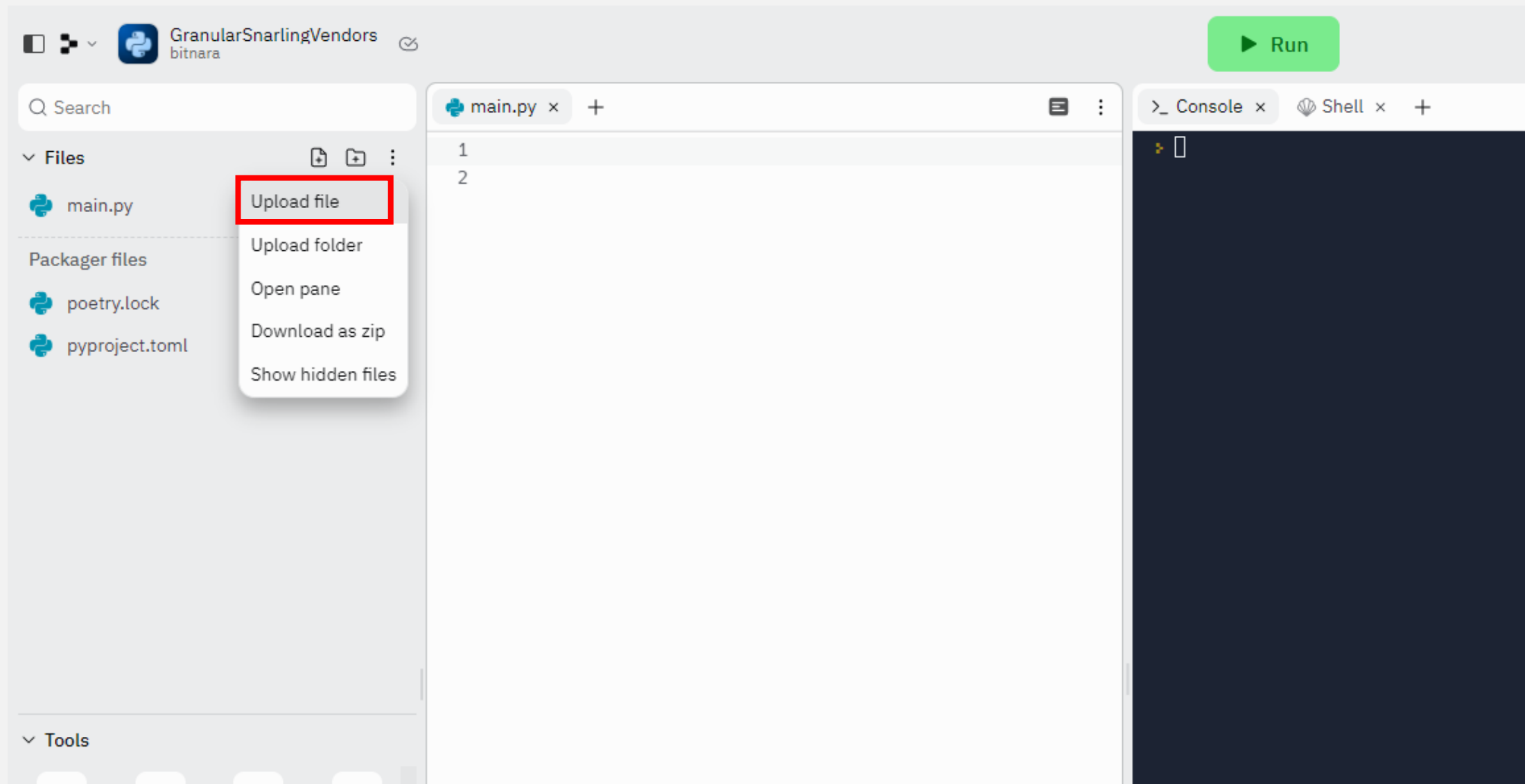
Why Netmiko?

Network automation to screen-scraping devices is primarily concerned with gathering output from show commands and with making configuration changes.

<https://pypi.org/project/netmiko/>



replit에 csv 파일 올리기





csv 파일 읽기

The screenshot shows a Python IDE with a file named `main.py` open. The code in `main.py` is as follows:

```
1 import csv
2
3 with open('20.4.144.41_sh_ip_int_br.csv', 'r') as f:
4     reader = csv.reader(f, delimiter=',')
5     for row in reader:
6         print(row)
```

The console output shows the following rows from the CSV file:

```
['Interface', 'IP-Address', 'OK?',
['Vlan1', 'unassigned', 'YES', 'unse
['Vlan99', 'unassigned', 'YES', 'un
['Vlan100', '100.127.100.1', 'YES',
['GigabitEthernet0/0', '20.4.144.41
['GigabitEthernet1/0/1', 'unassigned
['GigabitEthernet1/0/2', 'unassigned
['GigabitEthernet1/0/3', 'unassigned
['GigabitEthernet1/0/4', 'unassigned
['GigabitEthernet1/0/5', 'unassigned
['GigabitEthernet1/0/6', 'unassigned
['GigabitEthernet1/0/7', 'unassigned
['GigabitEthernet1/0/8', 'unassigned
['GigabitEthernet1/0/9', 'unassigned
```

```
import csv
with open('20.4.144.41_sh_ip_int_br.csv', 'r') as f:
    reader = csv.reader(f, delimiter=',')
    for row in reader:
        print(row)
```



csv 파일 읽기

```
main.py x +
/
8 import csv
9 from pprint import pprint
10
11 data = []
12 with open('20.4.144.41_sh_ip_int_br.csv', 'r') as f:
13     reader = csv.DictReader(f, delimiter=',')
14     for row in reader:
15         data.append(row)
16 pprint(data)
17
18
19
20
21
22
```

```
>_ Console x Shell x +
[{'IP-Address': 'unassigned',
  'Interface': 'Vlan1',
  'Method': 'unset',
  'OK?': 'YES',
  'Protocol': 'down',
  'Status': 'administratively down'},
 {'IP-Address': 'unassigned',
  'Interface': 'Vlan99',
  'Method': 'unset',
  'OK?': 'YES',
  'Protocol': 'up',
  'Status': 'up'},
 {'IP-Address': '100.127.100.1',
  'Interface': 'Vlan100',
  'Method': 'manual',
  'OK?': 'YES',
  'Protocol': 'up',
  'Status': 'up'},
 {'IP-Address': '20.4.144.41',
```

```
import csv
data = []
with open('20.4.144.41_sh_ip_int_br.csv', 'r') as f:
    reader = csv.DictReader(f, delimiter=',')
    for row in reader:
        data.append(row)
```



문제

1. '20.4.144.41_sh_ip_int_br.csv' 파일을 읽고, status와 protocol이 모두 up인 interface만 출력하여 txt 파일로 저장하세요.

```
import csv

field_name = ['Interface', 'IP-Address', 'OK?', 'Method', 'Status', 'Protocol']
result = [
    {'IP-Address': 'unassigned', 'Interface': 'Port-channel1', 'Method': 'unset', 'OK?': 'YES', 'Protocol': 'up', 'Status': 'up'},
    {'IP-Address': 'unassigned', 'Interface': 'Port-channel10', 'Method': 'unset', 'OK?': 'YES', 'Protocol': 'up', 'Status': 'up'},
    ...]

with open('20.4.144.41_sh_ip_int_br.txt', 'w') as f:
    writer = csv.DictWriter(f, fieldnames=field_name)
    writer.writeheader()
    for row in result:
        writer.writerow(row)
```



문제

2. ipaddress 모듈을 이용해 사용자가 입력한 ip중에 정상적인 ip를 출력하는 함수를 작성하세요.

```
main.py x +
main.py
44 import ipaddress
45
46 def check_ip(ip):
47     try:
48         ipaddress.ip_address(ip)
49         return True
50     except ValueError as err:
51         return False
52
53 print('10.10.10.10: ', check_ip('10.10.10.10'))
54 print('1.1.1: ', check_ip('1.1.1'))
55
56 from check_ip_func import return_correct_ip
57
58 ip_list = input('Cheking list of IP addresses: ')
59 correct = return_correct_ip(ip_list)
60 print(correct)
```

```
>_ Console x Shell x +
10.10.10.10: True
1.1.1: False
Cheking list of IP addresses: 10.10.10.10, 1.1.1
['10.10.10.10']
>
```




문제

3. 사용자에게 IP주소와 서브넷마스크를 입력 받아 네트워크 ID와 CIDR을 구하세요.

※Hint

- 10진수를 2진수로 변환: `format(255, 'b')`
- 2진수를 10진수로 변환: `int('11111111', 2)`

```
192.168.103.252 => 11000000 10101000 01100111 11111100
255.255.255.0   => 11111111 11111111 11111111 00000000
                  -----
                  11000000 10101000 01100111 00000000
=> 192           168           103           0
```

```
main.py x +
main.py
38 from check_ip_func import ip_subnet_calculator
39
40 ip = input('ip: ')
41 subnet = input('subnet mask: ')
42 ip_subnet_calculator(ip, subnet)
43

>_ Console x Shell x +
ip: 192.168.103.252
subnet mask: 255.255.252.0
네트워크 ID : 192.168.100.0
CIDR       : 22
>
>
```



참고

<https://developer.cisco.com/>

https://pyneng.readthedocs.io/_/downloads/en/latest/pdf/



수고하셨습니다.

