

Tips

?? UTF-8 ??

```
#!/usr/bin/python
# -*- coding: utf-8 -*-
```

Find all installed modules

```
help("modules");
```

????????????

```
import powerline
powerline.__path__

# Return ['/home/along/.local/lib/python3.10/site-packages/powerline']
```

Virtual Environment

- [How to Install and Manage Python Versions in Linux - Make Tech Easier](#)

Conda

```
# Create a virtual env
conda create -n myproj python=3.11

# Activate the virtual env
conda activate myproj

# Deactivate the virtual env
conda deactivate
```

Python 3.4+ built-in venv

```
# Install venv
sudo apt install python3-venv

# Enable venv
mkdir myproject
cd myproject
python -m venv .venv

# Activate the venv
source .venv/bin/activate

# Delete the venv
deactivate
rm -rf .venv

# Change the App directory after activating venv
cd /path/to
mv old new
cd new/.venv/bin
old_path="/path/to/old/.venv"
new_path="/path/to/new/.venv"
find ./ -type f -exec sed -i "s|$old_path|$new_path|g" {} \;
cd /path/to/new
source .venv/bin/activate
```

With virtualenv and [virtualenvwrapper](#)

```
# Installing virtualenv and virtualenvwrapper
sudo pip install virtualenv virtualenvwrapper

# Update the profile ~/.bashrc
# Add the following lines

# Python virtualenv and virtualenvwrapper
export WORKON_HOME=$HOME/.virtualenvs
export VIRTUALENVWRAPPER_PYTHON=/usr/bin/python3
source /usr/local/bin/virtualenvwrapper.sh

# Reload the profile
```

```
source ~/.bashrc
```

```
# Creating python virtual environment
```

```
# The py3cv3 is a self-defined name
```

```
mkvirtualenv py3cv3 -p python3
```

```
# Enter the specified virtual environment
```

```
workon py3cv3
```

```
# Exit the the specified virtual environment
```

```
deactivate
```

```
# List all of the environments.
```

```
lsvirtualenv
```

```
# Remove an environment
```

```
rmvirtualenv py3cv3
```

Print

- `print(... , end=" ")` ???????????
- `print "[" + str(left) + "|"` ?????????????? `str()` ??
- `print()` ??????????
- `print(, file=sys.stderr)` : ?????????? `sys.stdout` (?????)

```
for left in range(7):
```

```
    for right in range(left, 7):
```

```
        print "[" + str(left) + "|" + str(right) + "]", end=" "
```

```
    print()
```

Print the List with `join()`

```
greetings = ["Hello", "world"]
```

```
print(" ".join(greetings)) # Prints "Hello world"
```

Timestamp

```
timestamp = datetime.datetime.now()
```

```
print("It is {}".format(timestamp.strftime("%A %d %B %Y %I:%M:%S%p")))
```

Math

```
total += 1
```

If-else

```
# Boolean, none
if motion is not None:
    if not flag:

# Number
if delay > 0:
if delay == 0:
if total > frameCount:

# String
if "blue" in style:
if authors.startswith([''):
    authors = authors.lstrip(['').rstrip('')

# One-liner
def doi_url(d): return f'http://{d}' if d.startswith('doi.org') else f'http://doi.org/{d}'

# Multiple conditions
temperature = 25
if temperature > 30:
    print('Hot')
elif temperature > 20 and temperature <= 30:
    print('Warm')
else:
    print('Cool')

# Reverse the True
temperature = 15
if not temperature > 20:
    print('Cool')
#
temperature = 25
humidity = 55
rain = 0
```

```
if temperature > 30 or humidity < 70 and not rain > 0:  
    print('Dry conditions')
```

```
# Logical operators, AND, OR, NOT  
if status >= 200 and status <= 226:  
if status == 100 or status == 102:  
if not(status >= 200 and status <= 226):
```

operator

operator	use
>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to
==	equal to
!=	not equal to

sys.argv

- ??? Script ????

```
import sys  
  
logfile = sys.argv[1]  
with open(logfile) as f:  
    for line in f:  
        if "CRON" not in line:  
            continue  
        print(line.strip())
```

argparse

- ??? Script ????
- Manual: <https://docs.python.org/3/library/argparse.html>

```
import argparse  
  
# construct the argument parser and parse the arguments  
ap = argparse.ArgumentParser()
```

```

ap.add_argument("-i", "--interval", required=False,
                help="Seconds to Interval (Default:30)", default="30", type=int)
ap.add_argument("-o", "--output", required=False,
                help="Path to Output Logs (Default:std-out)")
ap.add_argument("mac",
                help="MAC address of LYWSD02 device", nargs="+")
args = vars(ap.parse_args())

# Usage
intv = args["interval"]
logfile = args["output"]

```

```

from argparse import ArgumentParser

def _get_args():
    parser = ArgumentParser()
    parser.add_argument("-c", "--checkpoint-path", type=str, default=DEFAULT_CKPT_PATH,
                        help="Checkpoint name or path, default to %(default)r")
    parser.add_argument("--cpu-only", action="store_true", help="Run demo with CPU only")

    parser.add_argument("--share", action="store_true", default=False,
                        help="Create a publicly shareable link for the interface.")
    parser.add_argument("--inbrowser", action="store_true", default=False,
                        help="Automatically launch the interface in a new tab on the default browser.")
    parser.add_argument("--server-port", type=int, default=8000,
                        help="Demo server port.")
    parser.add_argument("--server-name", type=str, default="127.0.0.1",
                        help="Demo server name.")

    args = parser.parse_args()
    return args

def _test_args(args):
    if args.cpu_only:
        device_map = "cpu"
    else:
        device_map = "auto"

    ckp_path = args.checkpoint_path

```

```
    return device_map, ckp_path
```

```
def main():
```

```
    args = _get_args()
```

```
    device_map, ckp_path = _test_args(args)
```

```
if __name__ == '__main__':
```

```
    main()
```

```
#
```

```
# Nagios2 HTTP proxy test
```

```
#
```

```
# usage: check_http_proxy --proxy=proxy:port --auth=user:pass --url=url --timeout=10 --warntime=5 --  
expect=content
```

```
import sys
```

```
import getopt
```

```
def get_cmdline_cfg():
```

```
    try:
```

```
        opts, args = getopt.getopt(
```

```
            sys.argv[1:],
```

```
            "p:a:t:w:e:u:",
```

```
            ["proxy=", "auth=", "timeout=", "warntime=", "expect=", "url="]
```

```
        )
```

```
    except getopt.GetoptError, err:
```

```
        print("SCRIPT CALLING ERROR: {0}".format(str(err)))
```

```
    ### Build cfg dictionary
```

```
    cfg = {}
```

```
    for o, a in opts:
```

```
        if o in ("-p", "--proxy"):
```

```
            cfg["proxy"] = a
```

```
        elif o in ("-a", "--auth"):
```

```
            cfg["auth"] = a
```

```
        elif o in ("-t", "--timeout"):
```

```
            cfg["timeout"] = float(a)
```

```
        elif o in ("-w", "--warntime"):
```

```
            cfg["warntime"] = float(a)
```

```

elif o in ("-e", "--expect"):
    cfg["expect"] = a
elif o in ("-u", "--url"):
    cfg["url"] = a

# These are required
for req_param in ("url", "proxy"):
    if req_param not in cfg:
        print("Missing parameter: {0}".format(req_param))

return cfg

# Usage
if __name__ == '__main__':
    cfg = get_cmdline_cfg()

    if "auth" in cfg:
        proxy_url = "http://{auth}@{proxy}/".format(**cfg)
    else:
        proxy_url = "http://{proxy}/".format(**cfg)

```

Reading and Writing files

Open mode

- r : Read only (default)
- w : Write only
- a : Append
- r+ : Read-Write
- t : Text mode (default)
- b : Binary mode
- x : open for exclusive creation, failing if the file already exists

Read file: ?????????????? String ??

Tip: ? with ??????????????????????

```

with open("spider.txt") as file:
    for line in file:
        print(line.strip().upper())

```


Read file: ?????????????? List ??

```
file = open("spider.txt")
lines = file.readlines()
file.close()
lines.sort()
print(lines)
```

Write a file: ????? String ?????????????? string ?????

```
with open("novel.txt", "w") as file:
    file.write("It was a dark and stormy night")

# Return 30
# when successful, return the length of the string
```

```
guests = open("guests.txt", "w")
initial_guests = ["Bob", "Andrea", "Manuel", "Polly", "Khalid"]

for i in initial_guests:
    guests.write(i + "\n")

guests.close()
```

Read and Write file

```
# Read a txt file
with open("update_log.txt", "r") as file:
    updates = file.read()

print(updates)

# Write a txt file
# With both "w" and "a", you can use the .write() method
# "a" if you want to append to a file
line = "jrafael,192.168.243.140,4:56:27,True"
with open("access_log.txt", "w") as file:
    file.write(line)

# Write a CSV or multi-lines file
```

```
login_file = ""username,ip_address,time,date
tshah,192.168.92.147,15:26:08,2022-05-10
dtanaka,192.168.98.221,9:45:18,2022-05-09
tmitchel,192.168.110.131,14:13:41,2022-05-11
daquino,192.168.168.144,7:02:35,2022-05-08
eraab,192.168.170.243,1:45:14,2022-05-11
jlansky,192.168.238.42,1:07:11,2022-05-11
acook,192.168.52.90,9:56:48,2022-05-10
""
```

```
with open("login.txt", "w") as file:
    file.write(login_file)
```

Encoding: ??????????????????

```
f = open('workfile', 'w', encoding="utf-8")

with open('log_file', mode='r',encoding='UTF-8') as file:
    for log in file.readlines():
```

File and Directory

Managing files

```
import os
os.remove("novel.txt")

os.rename("first_draft.txt", "finished_masterpiece.txt")

os.path.exists("finished_masterpiece.txt")
# Return True or False

os.path.getsize("spider.txt")
#This code will provide the file size

import datetime
timestamp = os.path.getmtime("spider.txt")
datetime.datetime.fromtimestamp(timestamp)
#This code will provide the date and time for the file in an
#easy-to-understand format
```

```
os.path.abspath("spider.txt")  
#This code takes the file name and turns it into an absolute path
```

Managing directories

```
os.mkdir("new_dir")  
#The os.mkdir("new_dir") function creates a new directory called new_dir  
  
os.chdir("new_dir")  
os.getcwd()  
#This code snippet changes the current working directory to new_dir.  
#The second line prints the current working directory.  
  
os.mkdir("newer_dir")  
os.rmdir("newer_dir")  
#This code snippet creates a new directory called newer_dir.  
#The second line deletes the newer_dir directory.  
  
import os  
os.listdir("website")  
#This code snippet returns a list of all the files and  
#sub-directories in the website directory.  
  
dir = "website"  
for name in os.listdir(dir):  
    fullname = os.path.join(dir, name)  
    if os.path.isdir(fullname):  
        print("{} is a directory".format(fullname))  
    else:  
        print("{} is a file".format(fullname))
```

Using os module

```
# Create a directory and move a file from one directory to another  
# using low-level OS functions.  
  
import os  
  
# Check to see if a directory named "test1" exists under the current
```

```
# directory. If not, create it:
dest_dir = os.path.join(os.getcwd(), "test1")
if not os.path.exists(dest_dir):
    os.mkdir(dest_dir)

# Construct source and destination paths:
src_file = os.path.join(os.getcwd(), "sample_data", "README.md")
dest_file = os.path.join(os.getcwd(), "test1", "README.md")

# Move the file from its original location to the destination:
os.rename(src_file, dest_file)
```

Using pathlib module

```
# Create a directory and move a file from one directory to another
# using Pathlib.

from pathlib import Path

# Check to see if the "test1" subdirectory exists. If not, create it:
dest_dir = Path("./test1/")
if not dest_dir.exists():
    dest_dir.mkdir()

# Construct source and destination paths:
src_file = Path("./sample_data/README.md")
dest_file = dest_dir / "README.md"

# Move the file from its original location to the destination:
src_file.rename(dest_file)
```

os.environ

- `.copy()` : ??????????? dictionary
- `.get(NAME, "")` : ?? NAME ????
- `my_env["PATH"]` : ?? PATH ???

```
import os
import subprocess

my_env = os.environ.copy()
my_env["PATH"] = os.pathsep.join(["/opt/myapp/", my_env["PATH"]])

result = subprocess.run(["myapp"], env=my_env)
```

```
import os
print("HOME: " + os.environ.get("HOME", ""))
print("SHELL: " + os.environ.get("SHELL", ""))
print("FRUIT: " + os.environ.get("FRUIT", ""))
```

input

- input() : ?? string ????

```
def to_seconds(hours, minutes, seconds):
    return hours*3600+minutes*60+seconds

print("Welcome to this time converter")

cont = "y"
while(cont.lower() == "y"):
    hours = int(input("Enter the number of hours: "))
    minutes = int(input("Enter the number of minutes: "))
    seconds = int(input("Enter the number of seconds: "))

    print("That's {} seconds".format(to_seconds(hours, minutes, seconds)))
    print()
    cont = input("Do you want to do another conversion? [y to continue] ")

print("Goodbye!")
```

subprocess

Run system commands in Python

- subprocess ???????? script (???) ??????????????
- ?????????????????????
- ?????????? List ???????? ["command", "opt1", "opt2"]
- .returncode : ??????0 ?????1 ???
- .stderr : ?????????????????(An array of bytes)??? decode() ??? string ??

```
import subprocess
subprocess.run(["date"])
subprocess.run(["sleep", "2"])
result = subprocess.run(["ls", "this_file_does_not_exist"])
print(result.returncode)
print(result.stderr)
```

- run(, capture_output=True) : ???????????? (python 3.7+ ??)
- .stdout : ?????????????????(An array of bytes)??? decode() ??? string ??

```
result = subprocess.run(["host", "8.8.8.8"], capture_output=True)
print(result.stdout)

# Output: b'8.8.8.8.in-addr.arpa domain name pointer dns.google.\n'

result = subprocess.run(["host", "8.8.8.8"], capture_output=True)
print(result.stdout.decode().split())
```

- run(, env=my_env) : ???????

```
import os
import subprocess

my_env = os.environ.copy()
my_env["PATH"] = os.pathsep.join(["/opt/myapp/", my_env["PATH"]])

result = subprocess.run(["myapp"], env=my_env)
```

- run(, capture_output=True, text=True) : ?????????? decode

```
result_run = subprocess.run(['echo', 'Hello, World!'], capture_output=True, text=True)
result_run.stdout.strip() # Extracting the stdout and stripping any extra whitespace

# Output: 'Hello, World!'
```

- `check_call()` : ???????????

```
return_code_check_call = subprocess.check_call(['echo', 'Hello from check_call!'])
print(return_code_check_call)
```

Output 0

- `check_output()` : ?????????????

```
output_check_output = subprocess.check_output(['echo', 'Hello from check_output!'], text=True)
output_check_output.strip() # Extracting the stdout and stripping any extra whitespace
```

Output 'Hello from check_output!'

- `Popen()` : ?????????????? input/output/error ????????
- `.poll()` : ??? NONE??????????

```
process_popen = subprocess.Popen(['echo', 'Hello from popen!'], stdout=subprocess.PIPE, text=True)
output_popen, _ = process_popen.communicate()
output_popen.strip() # Extracting the stdout and stripping any extra whitespace
```

Output: 'Hello from popen!'

```
process = subprocess.Popen(['sleep', '5'])
message_1 = "The process is running in the background..."

# Give it a couple of seconds to demonstrate the asynchronous behavior
import time
time.sleep(2)

# Check if the process has finished
if process.poll() is None:
    message_2 = "The process is still running."
else:
    message_2 = "The process has finished."

print(message_1, message_2)
```

- ?? os , Pathlib ??????????????????????

```
# subprocess
subprocess.run(['mkdir', 'test_dir_subprocess2'])

# OS
os.mkdir('test_dir_os2')

# Pathlib
test_dir_pathlib2 = Path('test_dir_pathlib2')
test_dir_pathlib2.mkdir(exist_ok=True) #Ensures the directory is created only if it doesn't already exist
```

logging

Level: DEBUG, INFO, WARNING, ERROR, CRITICAL

```
import logging

logging.warning('This is a warning message')
logging.error('This is an error message')

logging.basicConfig(level=logging.DEBUG)
logging.debug('This is a debug message')

logging.basicConfig(filename='app.log', level=logging.DEBUG)
logging.info('This message will be written to app.log')

logging.basicConfig(format='%(asctime)s - %(levelname)s - %(message)s', level=logging.DEBUG)
logging.error('This is an error with a custom format')
```