```
jordansun@Jordans-MacBook-Pro github % cd iot
jordansun@Jordans-MacBook-Pro iot % cd lesson3
jordansun@Jordans-MacBook-Pro lesson3 % ls
1-wire_bb.png          ack_r2.py          covid               hello.py          ldr_lux.py        mq.py            socket_client.py    system_info.py
2example.py            address.py         cpu.py              hello_c.py        ldrtmp.py         no2.py           socket_server.py    temperature.py
3example.py            auto.py            date_example.py     hello_r1.py       led.py            no2co.py         soil.py             test_email.py
README.md              battery.py         datetime_example.py hello_r2.py       manual.py         pyexample.py     sound.py            time_example.py
accelerometer.py       blink.py           document.txt        julian.py         micropython       pypy             student.py          touch.py
ack_c.py               co.py              documentstats.py    ldr_adc.py        moon.py           servo1.py        sun.py
ack_r1.py              coordinates.py     file.txt            ldr_bb.png        morse_code.py     servomotor.py    sun_xidian.py
jordansun@Jordans-MacBook-Pro lesson3 % python3 julian.py
Traceback (most recent call last):
  File "julian.py", line 2, in <module>
    from jdcal import *
ModuleNotFoundError: No module named 'jdcal'
jordansun@Jordans-MacBook-Pro lesson3 % pip install jdcal
zsh: command not found: pip
jordansun@Jordans-MacBook-Pro lesson3 % pip3 install jdcal
Defaulting to user installation because normal site-packages is not writeable
Collecting jdcal
  Downloading jdcal-1.4.1-py2.py3-none-any.whl (9.5 kB)
Installing collected packages: jdcal
Successfully installed jdcal-1.4.1
WARNING: You are using pip version 20.2.3; however, version 22.0.3 is available.
You should consider upgrading via the '/Library/Developer/CommandLineTools/usr/bin/python3 -m pip install --upgrade pip' command.
jordansun@Jordans-MacBook-Pro lesson3 % python3 julian.py
Calendar Date: 2022-02-16
Julian Date: 2459626.5
Modified Julian Date: 59626.0
jordansun@Jordans-MacBook-Pro lesson3 % python3 date_example.py
Date: 2022-02-16
Date: 02-16-22
Day of Week: Wednesday
Month: February
Year: 2022
170 days after the first day of classes
-68 days before the last day of classes
jordansun@Jordans-MacBook-Pro lesson3 % python3 datetime_example.py
2022-02-16 10:12:54.756363
2022-02-16 10:12:54.756396
2022-02-16 15:12:54.756402
1645024374.756578
Wed Feb 16 10:12:54 2022
2022-02-16 10:12:54.756597
2022-02-16 15:12:54.756602
jordansun@Jordans-MacBook-Pro lesson3 % python3 time_example.py
Wed Feb 16 10:13:08 2022
^C
jordansun@Jordans-MacBook-Pro lesson3 % █
```

```
ModuleNotFoundError: No module named 'pytz'
jordansun@Jordans-MacBook-Pro lesson3 % pip3 install sys
Defaulting to user installation because normal site-packages is not writeable
ERROR: Could not find a version that satisfies the requirement sys (from versions: none)
ERROR: No matching distribution found for sys
WARNING: You are using pip version 20.2.3; however, version 22.0.3 is available.
You should consider upgrading via the '/Library/Developer/CommandLineTools/usr/bin/python3 -m pip install --upgrade pip' command.
jordansun@Jordans-MacBook-Pro lesson3 % /Library/Developer/CommandLineTools/usr/bin/python3 -m pip install --upgrade pip
Defaulting to user installation because normal site-packages is not writeable
Collecting pip
  Downloading pip-22.0.3-py3-none-any.whl (2.1 MB)
     |████████████████████████████████| 2.1 MB 4.7 MB/s
Installing collected packages: pip
  WARNING: The scripts pip, pip3 and pip3.8 are installed in '/Users/jordansun/Library/Python/3.8/bin' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.
Successfully installed pip-22.0.3
jordansun@Jordans-MacBook-Pro lesson3 % pip3 install sys
Defaulting to user installation because normal site-packages is not writeable
ERROR: Could not find a version that satisfies the requirement sys (from versions: none)
ERROR: No matching distribution found for sys
jordansun@Jordans-MacBook-Pro lesson3 % python3 -m pip install sys
Defaulting to user installation because normal site-packages is not writeable
ERROR: Could not find a version that satisfies the requirement sys (from versions: none)
ERROR: No matching distribution found for sys
jordansun@Jordans-MacBook-Pro lesson3 % pip3 install pytz
Defaulting to user installation because normal site-packages is not writeable
Collecting pytz
  Downloading pytz-2021.3-py2.py3-none-any.whl (503 kB)
     |████████████████████████████████| 503.5/503.5 KB 9.7 MB/s eta 0:00:00
Installing collected packages: pytz
Successfully installed pytz-2021.3
jordansun@Jordans-MacBook-Pro lesson3 % python3 sun.py 'New York'
Traceback (most recent call last):
  File "sun.py", line 3, in <module>
    from astral.geocoder import database, lookup
ModuleNotFoundError: No module named 'astral'
jordansun@Jordans-MacBook-Pro lesson3 % pip3 install astral
Defaulting to user installation because normal site-packages is not writeable
Collecting astral
  Downloading astral-2.2-py2.py3-none-any.whl (30 kB)
Requirement already satisfied: pytz in /Users/jordansun/Library/Python/3.8/lib/python/site-packages (from astral) (2021.3)
Installing collected packages: astral
Successfully installed astral-2.2
jordansun@Jordans-MacBook-Pro lesson3 % python3 sun.py 'New York'
Information for New York/USA

Timezone: US/Eastern
Latitude: 40.72; Longitude: -74.00

Dawn:    2022-02-16 06:20:15.790191-05:00
Sunrise: 2022-02-16 06:48:47.385380-05:00
Noon:    2022-02-16 12:10:05-05:00
Sunset:  2022-02-16 17:31:52.397668-05:00
Dusk:    2022-02-16 18:00:25.983685-05:00
jordansun@Jordans-MacBook-Pro lesson3 % █
```

```
jordansun@Jordans-MacBook-Pro lesson3 % python3 moon.py
2022-02-16 Moon Phase: 13
2022-02-17 Moon Phase: 14
2022-02-18 Moon Phase: 15
2022-02-19 Moon Phase: 16
2022-02-20 Moon Phase: 17
2022-02-21 Moon Phase: 18
2022-02-22 Moon Phase: 19
2022-02-23 Moon Phase: 20
2022-02-24 Moon Phase: 21
2022-02-25 Moon Phase: 22
2022-02-26 Moon Phase: 23
2022-02-27 Moon Phase: 24
2022-02-28 Moon Phase: 25
2022-03-01 Moon Phase: 26
2022-03-02 Moon Phase: 27
2022-03-03 Moon Phase: 0
2022-03-04 Moon Phase: 1
2022-03-05 Moon Phase: 2
2022-03-06 Moon Phase: 3
2022-03-07 Moon Phase: 4
2022-03-08 Moon Phase: 5
2022-03-09 Moon Phase: 6
2022-03-10 Moon Phase: 7
2022-03-11 Moon Phase: 7
2022-03-12 Moon Phase: 8
2022-03-13 Moon Phase: 9
2022-03-14 Moon Phase: 10
2022-03-15 Moon Phase: 11
2022-03-16 Moon Phase: 12
2022-03-17 Moon Phase: 13
jordansun@Jordans-MacBook-Pro lesson3 % python3 coordinates.py 'SC Williams Library'
Traceback (most recent call last):
  File "coordinates.py", line 2, in <module>
    from geopy.geocoders import Nominatim
ModuleNotFoundError: No module named 'geopy'
jordansun@Jordans-MacBook-Pro lesson3 % pip3 install geopy
Defaulting to user installation because normal site-packages is not writeable
Collecting geopy
  Downloading geopy-2.2.0-py3-none-any.whl (118 kB)
     ──────────────────────────────── 118.9/118.9 KB 3.0 MB/s eta 0:00:00
Collecting geographiclib<2,>=1.49
  Downloading geographiclib-1.52-py3-none-any.whl (38 kB)
Installing collected packages: geographiclib, geopy
Successfully installed geographiclib-1.52 geopy-2.2.0
jordansun@Jordans-MacBook-Pro lesson3 % python3 coordinates.py 'SC Williams Library'
SC Williams Library, Field House Road, Hoboken, Hudson County, New Jersey, 07030, United States
(40.74480675, -74.02532862031404)
jordansun@Jordans-MacBook-Pro lesson3 % 
```

```
● ● ●                                          🗂 lesson3 — -zsh — 204×55

jordansun@Jordans-MacBook-Pro lesson3 % python3 address.py '40.74480675, -74.02532862031404'
SC Williams Library, Field House Road, Hoboken, Hudson County, New Jersey, 07030, United States
(40.74480675, -74.02532862031404)
jordansun@Jordans-MacBook-Pro lesson3 % python3 cpu.py
Traceback (most recent call last):
  File "cpu.py", line 2, in <module>
    import psutil
ModuleNotFoundError: No module named 'psutil'
jordansun@Jordans-MacBook-Pro lesson3 % pip3 install psutil
Defaulting to user installation because normal site-packages is not writeable
Collecting psutil
  Downloading psutil-5.9.0.tar.gz (478 kB)
                     ━━━━━━━━━━━━━ 478.3/478.3 KB 4.2 MB/s eta 0:00:00
  Preparing metadata (setup.py) ... done
Building wheels for collected packages: psutil
  Building wheel for psutil (setup.py) ... done
  Created wheel for psutil: filename=psutil-5.9.0-cp38-cp38-macosx_10_14_6_arm64.whl size=264763 sha256=9480ad529bd7eaf85946b7b16d76e674a7ff5623ef2ff1d8ade15eef2fc47c29
  Stored in directory: /Users/jordansun/Library/Caches/pip/wheels/9c/28/d8/45cbe6aa547b8b581dfa337cb3aaec76f3029d22f1199fff9e
Successfully built psutil
Installing collected packages: psutil
Successfully installed psutil-5.9.0
jordansun@Jordans-MacBook-Pro lesson3 % python3 cpu.py
The number of physical cores =  8
The number of logical CPUs =  8
The utilization per second as a percentage for each CPU
[26.7, 23.0, 21.0, 21.0, 4.0, 2.0, 2.0, 0.0]
[25.7, 24.0, 22.0, 20.8, 3.0, 2.0, 1.0, 0.0]
[25.3, 23.0, 22.0, 21.2, 3.0, 1.0, 1.0, 1.0]
[26.0, 23.8, 20.0, 19.8, 3.0, 2.0, 2.0, 1.0]
[25.0, 24.0, 22.5, 21.8, 3.0, 1.0, 1.0, 0.0]
[25.7, 23.8, 20.0, 18.0, 5.9, 3.0, 1.0, 0.0]
[24.0, 23.8, 22.0, 20.8, 2.0, 2.0, 2.0, 0.0]
^CTraceback (most recent call last):
  File "cpu.py", line 15, in <module>
    cpu = psutil.cpu_percent(interval=1, percpu=True)
  File "/Users/jordansun/Library/Python/3.8/lib/python/site-packages/psutil/__init__.py", line 1762, in cpu_percent
    time.sleep(interval)
KeyboardInterrupt

jordansun@Jordans-MacBook-Pro lesson3 % python3 battery.py
sbattery(percent=100, secsleft=54060, power_plugged=False)
jordansun@Jordans-MacBook-Pro lesson3 % python3 documentstats.py document.txt
Word Count: 1343
Top Ten Words: [('our', 26), ('their', 20), ('has', 20), ('he', 19), ('them', 15), ('these', 13), ('have', 11), ('we', 11), ('us', 11), ('people', 10)]
jordansun@Jordans-MacBook-Pro lesson3 % █
```

```
● ● ●                                          🗂 covid — -zsh — 204×55

jordansun@Jordans-MacBook-Pro lesson3 % cd covid
jordansun@Jordans-MacBook-Pro covid % python3 covid.py
/Library/Developer/CommandLineTools/usr/bin/python3: can't open file 'covid.py': [Errno 2] No such file or directory
jordansun@Jordans-MacBook-Pro covid % git pull
hint: Pulling without specifying how to reconcile divergent branches is
hint: discouraged. You can squelch this message by running one of the following
hint: commands sometime before your next pull:
hint:
hint:   git config pull.rebase false  # merge (the default strategy)
hint:   git config pull.rebase true   # rebase
hint:   git config pull.ff only       # fast-forward only
hint:
hint: You can replace "git config" with "git config --global" to set a default
hint: preference for all repositories. You can also pass --rebase, --no-rebase,
hint: or --ff-only on the command line to override the configured default per
hint: invocation.
remote: Enumerating objects: 49, done.
remote: Counting objects: 100% (49/49), done.
remote: Compressing objects: 100% (41/41), done.
remote: Total 41 (delta 29), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (41/41), 7.41 KiB | 199.00 KiB/s, done.
From https://github.com/kevinwlu/iot
   706728a..74cd917  master     -> origin/master
Updating 706728a..74cd917
Fast-forward
 lesson1/README.md      |  8 ++++++-
 lesson3/README.md      |  7 +++++--
 lesson3/covid/covid.py | 11 ++++++++++
 lesson6/README.md      |  1 +
 4 files changed, 24 insertions(+), 3 deletions(-)
 create mode 100644 lesson3/covid/covid.py
jordansun@Jordans-MacBook-Pro covid % python3 covid.py
Traceback (most recent call last):
  File "covid.py", line 4, in <module>
    p = int(sys.argv[1])
IndexError: list index out of range
jordansun@Jordans-MacBook-Pro covid % python3 covid.py 330000000 100000 7
Population      = 330000000
Infection rate  = 100000
Serial interval = 7
Time to infect  = 12.347361510679846
jordansun@Jordans-MacBook-Pro covid % █
```

```
jordansun@Jordans-MacBook-Pro covid % cd ..
jordansun@Jordans-MacBook-Pro lesson3 % ls
1-wire_bb.png        ack_r2.py         covid              hello.py        ldr_lux.py       mq.py        socket_client.py   system_info.py
2example.py          address.py        cpu.py             hello_c.py      ldrtmp.py        no2.py       socket_server.py   temperature.py
3example.py          auto.py           date_example.py    hello_r1.py     led.py           no2co.py     soil.py            test_email.py
README.md            battery.py        datetime_example.py hello_r2.py    manual.py        pyexample.py sound.py           time_example.py
accelerometer.py     blink.py          document.txt       julian.py       micropython      pypy         student.py         touch.py
ack_c.py             co.py             documentstats.py   ldr_adc.py      moon.py          servo1.py    sun.py
ack_r1.py            coordinates.py    file.txt           ldr_bb.png      morse_code.py    servomotor.py sun_xidian.py
jordansun@Jordans-MacBook-Pro lesson3 % cd pypy
jordansun@Jordans-MacBook-Pro pypy % ls
README.md      test.c        test.py
jordansun@Jordans-MacBook-Pro pypy % python3 test.py
1000000.0
jordansun@Jordans-MacBook-Pro pypy % 
```