Cisco
Assignment

Cheng Yi

Table of Contents

Testing the Internet Connection

- Change from requests (GET) to ping
  - requests handles HTTP/HTTPS
  - ping uses Internet Control Message Protocol (ICMP)

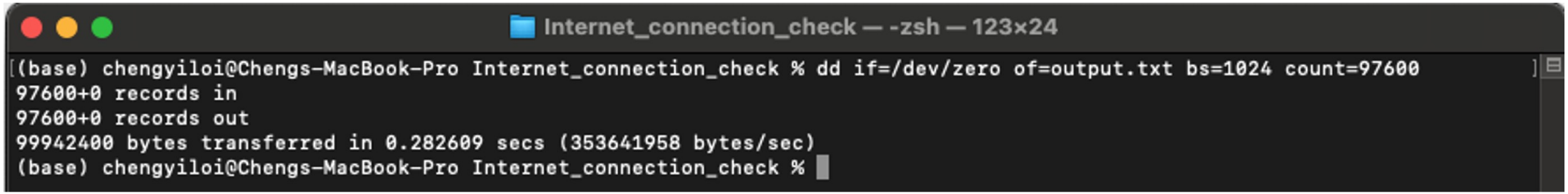
- Ping provides relevant network related metrics for troubleshooting:
  - Round-trip time
  - Packet loss percentage

```python
def internet_connection_test(url:str):
    print(f'Attempting to connect to {url} to determine internet connection status.')

    # ping uses ICMP protocol
    # pinging with 5 packets via -c flag with 10 second timeout
    response = os.popen(f"ping -c 5 -t 10 {url}")

    for line in response.readlines():
        print(line)
```

```
(base) chengyiloi@Chengs-MacBook-Pro Internet_connection_check % python internet_connection_check.py
Attempting to connect to google.com to determine internet connection status.
PING google.com (74.125.68.101): 56 data bytes

64 bytes from 74.125.68.101: icmp_seq=0 ttl=102 time=7.409 ms

64 bytes from 74.125.68.101: icmp_seq=1 ttl=102 time=13.902 ms

64 bytes from 74.125.68.101: icmp_seq=2 ttl=102 time=7.855 ms

64 bytes from 74.125.68.101: icmp_seq=3 ttl=102 time=8.066 ms

64 bytes from 74.125.68.101: icmp_seq=4 ttl=102 time=8.903 ms


--- google.com ping statistics ---

5 packets transmitted, 5 packets received, 0.0% packet loss

round-trip min/avg/max/stddev = 7.409/9.227/13.902/2.387 ms
```

Checking the Internet Download Speed

- Using requests and time modules
- Uploaded a 99.9 MB .txt file to Google Drive
  - File generated using the “dd” command
    - if=/dev/zero ~ special file on unix-like systems that produces null bytes
    - of ~ writes the data to a specified file
    - bs ~ block size of 1024 bytes
    - count ~ copies the number of blocks specified
  - Google Drive requires manual consent from user to download files larger than 100 MB that are not scanned for viruses



Checking the Internet Download Speed (Cont'd)

- Stream parameter allows the reading of response data in chunks compared to reading in one go ~ Better performance

```python
def bytes_to_mb(bytes:float):
    # 1e+6
    return float(bytes / pow(1024, 2))
```

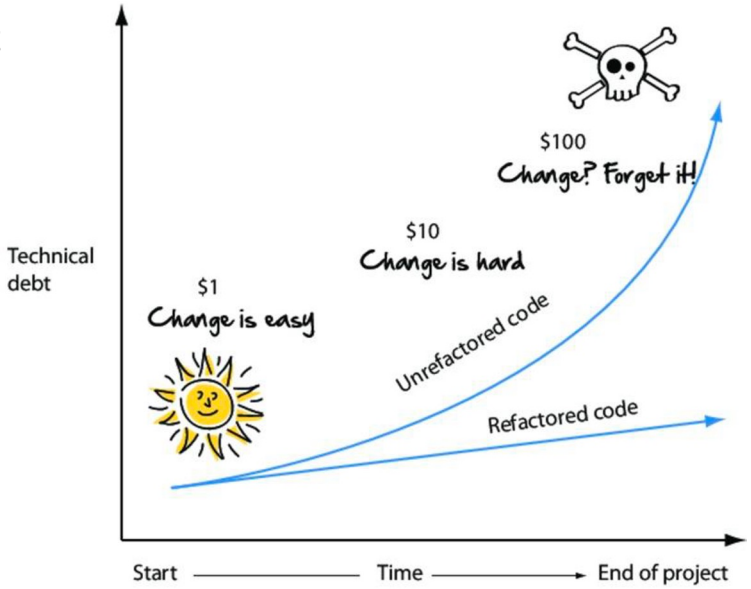
```python
def check_download_speed(url:str):
    start_time = time.time()
    response = requests.get(url, stream=True)

    # in Bytes
    total_length = float(response.headers.get('content-length'))

    if total_length is not None:
        # time since epoch in seconds
        elapsed_time = time.time() - start_time

        print(f'Elapsed time: {elapsed_time}')
        download_speed_mbps = bytes_to_mb(total_length) / elapsed_time

        print(f'Total length in mb: {round(bytes_to_mb(total_length), 1)}')
        print(f'Download speed in mbps: {round(download_speed_mbps, 1)}')
```

```
Downloading file from https://drive.google.com/uc?export=download&id=1B6rLZwZx9QkzulhB0Pcgci4BXPlHEu3Z to determine download speed.
Elapsed time: 2.6245670318603516
Total length in mb: 95.3
Download speed in mbps: 36.3
(base) chengyiloi@Chengs-MacBook-Pro Internet_connection_check %
```

Code Refactoring

- Working code is often the priority so code quality might be compromised, leading to **technical debt**

- Benefits of refactoring
  - Increase readability/maintainability
  - Reduce time to add new features
  - Reduce time to debug and fix defects



Code Refactoring (Cont'd)

- Code smell are symptoms of poor design or implementation choices
  - Identifying and addressing code smells is crucial aspect of code maintenance and improving code quality

- Duplicate code
  - Identical code fragments in different parts of the codebase
  - Maintenance becomes difficult, as changes must be made in multiple places

```
print(f'Elapsed time: {elapsed_time}')
download_speed_mbps = bytes_to_mb(total_length) / elapsed_time

print(f'Total length in mb: {round(bytes_to_mb(total_length), 1)}')
print(f'Download speed in mbps: {round(download_speed_mbps, 1)}')
```

```
def bytes_to_mb(bytes:float):
    # 1e+6
    return float(bytes / pow(1024, 2))
```

Q&A