ICN HW1

B09901066 謝承修

P1

1. Power: input format is "a ^ b", and the output is a^b.
2. Gcd: input format is "gcd a b", and the output is gcd(a, b).
3. Lcm: input format is "gcd a b", and the output is lcm(a, b).
4. Dot: input format is "v1 dot v2", where v1 and v2 are vectors, represented by x0,y0,z0,…, and output is v1 dot v2. Eg. 2,3 dot 1,4 → 14
5. Dist: input format is "dist p q", where p and q are of format (x0, y0), and output is the distance between two points. Eg. dist 4,3 1,7 → 5.0

P2

```
Ready to serve...
('127.0.0.1', 52950)connected
GET /index.html HTTP/1.1
Host: localhost:2089
Upgrade-Insecure-Requests: 1
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/16.1 Safari/605
.1.15
Accept-Language: en-US,en;q=0.9
Accept-Encoding: gzip, deflate
Connection: keep-alive


/index.html
```

```
Ready to serve...
('127.0.0.1', 53196)connected
GET /helloworld.html HTTP/1.1
Host: localhost:2089
Connection: keep-alive
Upgrade-Insecure-Requests: 1
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/16.1 Safari/605
.1.15
Referer: http://localhost:2089/index.html
Accept-Language: en-US,en;q=0.9
Accept-Encoding: gzip, deflate


/helloworld.html
```

```
/notfound.html
404 Not Found
Ready to serve...
```

TODO description

Client 和 server 先建立連結

```python
# TODO start
HOST, PORT = "127.0.0.1", 2089
# HOST, PORT = ServerSocket.getsockname()[0], 2089
serverSocket = socket(AF_INET, SOCK_STREAM)
serverSocket.bind((HOST, PORT))
serverSocket.listen(1)
# TODO end
```

Server 接受客戶端的訊息

```python
# TODO start
        RecvMessage = ConnectionSocket.recv(2048).decode()
        print(RecvMessage)
        # TODO end
```

用 f.readlines()讀檔

```python
        # TODO start
        DataInFile = f.readlines()
        f.close()
        # TODO end
```

ConnectionSocket 傳 header line, status, type

```python
        # Send one HTTP header line into socket
        # Send HTTP Status to the client
        # TODO start
        ConnectionSocket.send(b'HTTP/1.1 200 OK\r\n')
        # TODO end

        # Send the Content Type to the client
        # TODO start
        ConnectionSocket.send(b'Content-Type: text/html; charset=utf-8\r\n\r\n')
        # TODO end
```

如果檔案不存在則有錯誤處理：ConnectionSocket傳錯誤訊息

```python
    # TODO start
    res = "404 Not Found"
    ConnectionSocket.send((res+"\r\n").encode())
    # ConnectionSocket.send(b"\r\n")
    print(res)
    # TODO end
```

關掉ConnectionSocket

```python
    # TODO start
    ConnectionSocket.close()
    # TODO end
```

P3

```
~/Doc/e/I/H/p2 > python web_server.py          ✦ pytorch
Ready to serve...
('127.0.0.1', 60938)connected
GET /index.html HTTP/1.1

/index.html
Ready to serve...
▯
```

```
~/Doc/e/I/H/p3 > python proxy_server.py localhost
Ready to serve...
Received a connection from: ('127.0.0.1', 60937)
GET /index.html HTTP/1.1
Host: localhost:7878
Upgrade-Insecure-Requests: 1
Accept: text/html,application/xhtml+xml,application/xml;q=0
.9,*/*;q=0.8
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7)
 AppleWebKit/605.1.15 (KHTML, like Gecko) Version/16.1 Safa
ri/605.1.15
Accept-Language: en-US,en;q=0.9
Accept-Encoding: gzip, deflate
Connection: keep-alive


/index.html
index.html
/index.html
host name is index.html
try to connect to the web_server
connected successfully
GET http:///index.html HTTP/1.1

get the file successfully
open the file successfully
Ready to serve...
▮
```

```
~/Doc/e/I/H/p2 > python web_server.py          ✦ pytorch
Ready to serve...
▯
```

```
~/Doc/e/I/H/p3 > python proxy_server.py localhost
Ready to serve...
Received a connection from: ('127.0.0.1', 60943)
GET /index.html HTTP/1.1
Host: localhost:7878
Upgrade-Insecure-Requests: 1
Accept: text/html,application/xhtml+xml,application/xml;q=0
.9,*/*;q=0.8
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7)
 AppleWebKit/605.1.15 (KHTML, like Gecko) Version/16.1 Safa
ri/605.1.15
Accept-Language: en-US,en;q=0.9
Accept-Encoding: gzip, deflate
Connection: keep-alive


/index.html
index.html
/index.html
Read from cache
Ready to serve...
▮
```

```
~/Doc/e/I/H/p2 > python web_server.py              pytorch      ~/Doc/e/I/H/p3 > python proxy_server.py localhost
Ready to serve...                                                Ready to serve...
('127.0.0.1', 60955)connected                                   Received a connection from: ('127.0.0.1', 60954)
GET /nothing.html HTTP/1.1                                       GET /nothing.html HTTP/1.1
                                                                 Host: localhost:7878
/nothing.html                                                    Upgrade-Insecure-Requests: 1
404 Not Found                                                    Accept: text/html,application/xhtml+xml,application/xml;q=0
Ready to serve...                                                .9,*/*;q=0.8
                                                                 User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7)
                                                                  AppleWebKit/605.1.15 (KHTML, like Gecko) Version/16.1 Safa
                                                                 ri/605.1.15
                                                                 Accept-Language: en-US,en;q=0.9
                                                                 Accept-Encoding: gzip, deflate
                                                                 Connection: keep-alive


                                                                 /nothing.html
                                                                 nothing.html
                                                                 /nothing.html
                                                                 host name is nothing.html
                                                                 try to connect to the web_server
                                                                 connected successfully
                                                                 GET http:///nothing.html HTTP/1.1

                                                                 get the file successfully
                                                                 open the file successfully
                                                                 Ready to serve...
```

TODO description

前置作業（建立連接等）

```
# TODO start

HOST, PORT, WEB_PORT = sys.argv[1], 7878, 2089

TCPServerSocket.bind((HOST, PORT))

TCPServerSocket.listen()

# TODO end
```

接收訊息

```
    # TODO start

    TCPClientSocket, Addr = TCPServerSocket.accept()

    # TODO end

    # TODO start

    RecvMessage = TCPClientSocket.recv(1024).decode()

    # TODO end
```

Proxy -> Client (read from cache)

```
        # TODO start

        for i in range(0, len(DataInFile)):
```

```
        TCPClientSocket.send(DataInFile[i].encode('utf-8'))
    TCPClientSocket.send(("\r\n").encode('utf-8'))
    # TODO end
```

建立與 server 連接

```
        # TODO start
        SocketOnProxyServer = socket(AF_INET, SOCK_STREAM)
        # TODO end
```

```
        # TODO start
        SocketOnProxyServer.connect(('127.0.0.1', WEB_PORT))
        # TODO end
```

將 data 讀進 buffer

```
        # TODO start
        data = ''
        for i in range(10):
            data += SocketOnProxyServer.recv(1024).decode('utf-8')
        data = data.strip()
        data = data.split('<!DOCTYPE html>')[-1]
        data = '<!DOCTYPE html>' + data
        # TODO end
```

建立 cache, proxy –> client

```
        # TODO start
        TmpFile.write(data)
        TmpFile.flush()
        TmpFile.close()
        SocketOnProxyServer.close()
        TCPClientSocket.send(("HTTP/1.0 200 OK\r\n").encode('utf-8'))
        TCPClientSocket.send(("Content-Type:text/html\r\n").encode('utf-8'))
        TCPClientSocket.send(("\r\n").encode('utf-8'))
        TCPClientSocket.send(data.encode('utf-8'))
        TCPClientSocket.send(("\r\n").encode('utf-8'))
```

```
            # TODO end
```

```
            # TODO start
            TCPClientSocket.send(("HTTP/1.0 404 Error\r\n").encode('utf-8'))
            TCPClientSocket.send(("Content-Type:text/html\r\n").encode('utf-8'))
            TCPClientSocket.send(("\r\n").encode('utf-8'))
            # TODO end
```

關閉 server socket

```
# TODO start
TCPServerSocket.close()
# TODO end
```