

## 12.2: THE WORLD'S SIMPLEST WEB BROWSER



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Perhaps the easiest way to show how the HTTP protocol works is to write a very simple Python program that makes a connection to a web server and follows the rules of the HTTP protocol to request a document and display what the server sends back.

### CODE 12.2.1 (PYTHON):

```
%%python3

import socket

mysock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
mysock.connect(('data.pr4e.org', 80))
cmd = 'GET http://data.pr4e.org/romeo.txt HTTP/1.0\r\n\r\n'.encode()
mysock.send(cmd)

while True:
    data = mysock.recv(20)
    if (len(data) < 1):
        break
    print(data.decode(),end='')

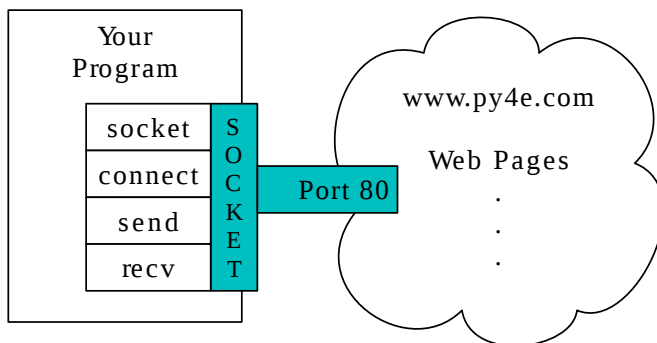
mysock.close()

# Code: http://www.py4e.com/code3/socket1.py
```

run

restart

First the program makes a connection to port 80 on the server [www.py4e.com](http://www.py4e.com). Since our program is playing the role of the "web browser", the HTTP protocol says we must send the GET command followed by a blank line.



#### A Socket Connection

Once we send that blank line, we write a loop that receives data in 512-character chunks from the socket and prints the data out until there is no more data to read (i.e., the `recv()` returns an empty string).

The program produces the following output:

```
HTTP/1.1 200 OK
Date: Sun, 14 Mar 2010 23:52:41 GMT
Server: Apache
Last-Modified: Tue, 29 Dec 2009 01:31:22 GMT
ETag: "143c1b33-a7-4b395bea"
Accept-Ranges: bytes
Content-Length: 167
Connection: close
Content-Type: text/plain
```

```
But soft what light through yonder window breaks
It is the east and Juliet is the sun
Arise fair sun and kill the envious moon
Who is already sick and pale with grief
```

The output starts with headers which the web server sends to describe the document. For example, the `Content-Type` header indicates that the document is a plain text document ( `text/plain` ).

After the server sends us the headers, it adds a blank line to indicate the end of the headers, and then sends the actual data of the file `romeo.txt` .

This example shows how to make a low-level network connection with sockets. Sockets can be used to communicate with a web server or with a mail server or many other kinds of servers. All that is needed is to find the document which describes the protocol and write the code to send and receive the data according to the protocol.

However, since the protocol that we use most commonly is the HTTP web protocol, Python has a special library specifically designed to support the HTTP protocol for the retrieval of documents and data over the web.