

Writing a UDP Client Program

Let's now write a client to go with the server we wrote.

WE'LL COVER THE FOLLOWING ^

- The Server
- Creating a Client Socket
- Reading Data
- Sending It to the Server
- Receiving the Server's Response
- Decoding & Printing the Capitalized Message

The Server

Here's the server code that we have so far for reference.

```
import socket

MAX_SIZE_BYTES = 65535 # Mazimum size of a UDP datagram

# Setting up a socket
s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
port = 3000
hostname = '127.0.0.1'
s.bind((hostname, port))
print('Listening at {}'.format(s.getsockname()))
while True:
    data, address = s.recvfrom(MAX_SIZE_BYTES)
    message = data.decode('ascii')
    upperCaseMessage = message.upper()
    print('The client at {} says {!r}'.format(clientAddress, message))
    data = upperCaseMessage.encode('ascii')
    s.sendto(data, clientAddress)
```

Creating a Client Socket

Instead of explicitly binding the socket to a given port and IP as we did previously, we can let the OS take care of it. Remember [ephemeral ports](#)? Yes

the OS will bind the socket to a port dynamically. So all we really need is to create a UDP socket (**line 3**).

```
import socket

s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
```

In fact, we can check what address and port the OS assigned to the socket using the following line of code on **line 4**:

```
import socket

s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
print('The OS assigned the address {} to me'.format(s.getsockname()))
```

You'll always get `(0.0.0.0,0)` for now because we haven't actually used the socket. You'll get the correct answer when we use the socket to send data in the next lesson.

Reading Data

Remember that the goal of this client and server was for the client to send a string to the server that it would capitalize and send back? Well, we'll get that string from the user's keyboard using the `Python3` function, `input()`. The function displays whatever prompt we specify, in this case the message 'Input lowercase sentence:' and waits for the user to provide an input from the keyboard (**line 4**). The user can then type a string of their choice and hit enter. The string will be stored in the variable `message`.

Next, we encode the ASCII encoded data to bytes using the `encode()` function (**line 5**).

```
import socket
```

```
s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
message = input('Input lowercase sentence: ' )
data = message.encode('ascii')
```

Sending It to the Server

We now send the message to the server using the `sendto()` function. In addition to the data, this function takes an IP address and a port number (**line 6**). We give it the IP address `127.0.0.1` and the port `3000` which we assigned to the server previously.

Also, notice that the `getsockname()` function will give us a useful answer at this point (**line 7**).

```
import socket

s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
message = input('Input lowercase sentence: ' )
data = message.encode('ascii')
s.sendto(data, ('127.0.0.1', 3000))
print('The OS assigned the address {} to me'.format(s.getsockname()))
```

Receiving the Server's Response

We next receive the server's response and limit it to the size `MAX_SIZE_BYTES` which we saw previously.

```
import socket

MAX_SIZE_BYTES = 65535 # Mazimum size of a UDP datagram

s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
message = input('Input lowercase sentence: ' )
data = message.encode('ascii')
s.sendto(data, ('127.0.0.1', 3000))
print('The OS assigned the address {} to me'.format(s.getsockname()))
data, address = s.recvfrom(MAX_SIZE_BYTES)
```

Decoding & Printing the Capitalized Message

Lastly, we decode and print the capitalized message that the server sent us.

```
import socket

MAX_SIZE_BYTES = 65535 # Mazimum size of a UDP datagram

s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
message = input('Input lowercase sentence: ' )
data = message.encode('ascii')
```

```
data = message.encode('ascii')
s.sendto(data, ('127.0.0.1', 3000))
print('The OS assigned the address {} to me'.format(s.getsockname()))
data, address = s.recvfrom(MAX_SIZE_BYTES)
text = data.decode('ascii')
print('The server {} replied with {!r}'.format(address, text))
```

Now we have both our server and client programs. Let's see them live in action next!