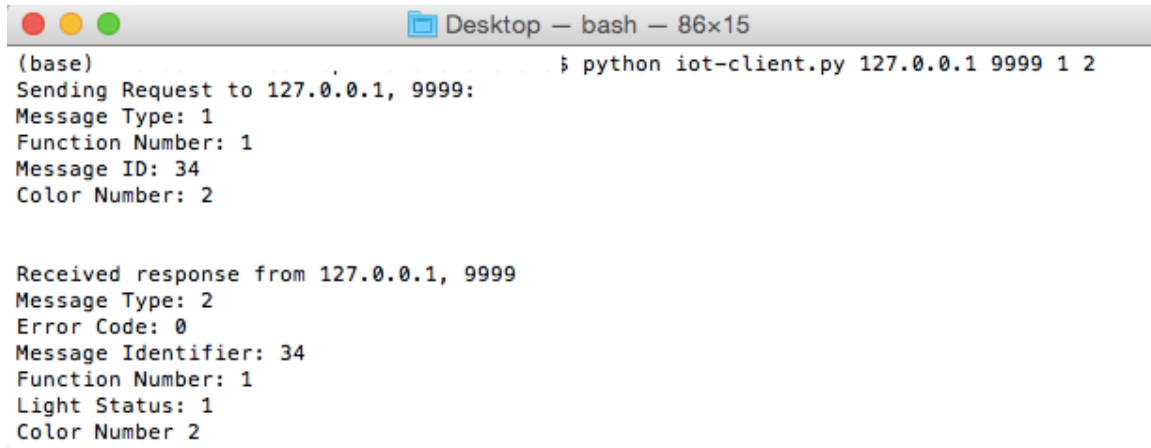


## Screenshots

**Test Case 1:** Turn the light bulb on and set the color (if the light bulb is already on, the operation should make no change)

A terminal window titled 'Desktop — bash — 86x15' showing the execution of a Python script. The script sends a request to 127.0.0.1 on port 9999 with function number 1 and color number 2. The response indicates the light is on and the color is 2.

```
(base) python3 iot-client.py 127.0.0.1 9999 1 2
Sending Request to 127.0.0.1, 9999:
Message Type: 1
Function Number: 1
Message ID: 34
Color Number: 2

Received response from 127.0.0.1, 9999
Message Type: 2
Error Code: 0
Message Identifier: 34
Function Number: 1
Light Status: 1
Color Number 2
```

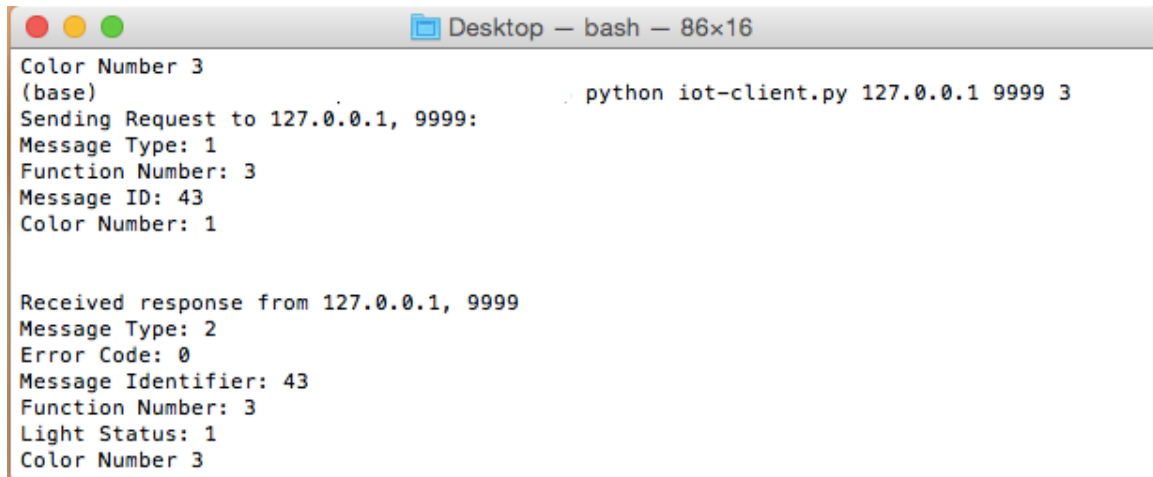
**Test Case 2:** Change the light color

A terminal window titled 'Desktop — bash — 86x15' showing the execution of a Python script. The script sends a request to 127.0.0.1 on port 9999 with function number 2 and color number 3. The response indicates the light is on and the color is 3.

```
(base) python3 iot-client.py 127.0.0.1 9999 2 3
Sending Request to 127.0.0.1, 9999:
Message Type: 1
Function Number: 2
Message ID: 33
Color Number: 3

Received response from 127.0.0.1, 9999
Message Type: 2
Error Code: 0
Message Identifier: 33
Function Number: 2
Light Status: 1
Color Number 3
```

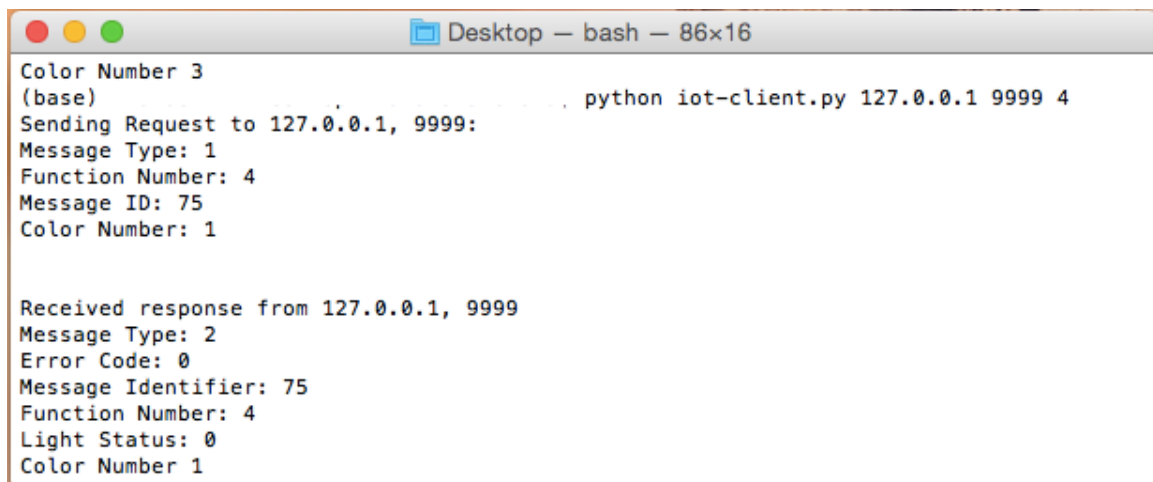
**Test Case 3:** Determine the status of the light: on+color, off, broken

A terminal window titled "Desktop — bash — 86x16" showing the execution of a Python script. The user enters "Color Number 3" and "(base)". The script sends a request to 127.0.0.1, 9999 with Message Type: 1, Function Number: 3, Message ID: 43, and Color Number: 1. The response from 127.0.0.1, 9999 shows Message Type: 2, Error Code: 0, Message Identifier: 43, Function Number: 3, Light Status: 1, and Color Number 3.

```
Desktop — bash — 86x16
Color Number 3
(base)
Sending Request to 127.0.0.1, 9999:
Message Type: 1
Function Number: 3
Message ID: 43
Color Number: 1

Received response from 127.0.0.1, 9999
Message Type: 2
Error Code: 0
Message Identifier: 43
Function Number: 3
Light Status: 1
Color Number 3
```

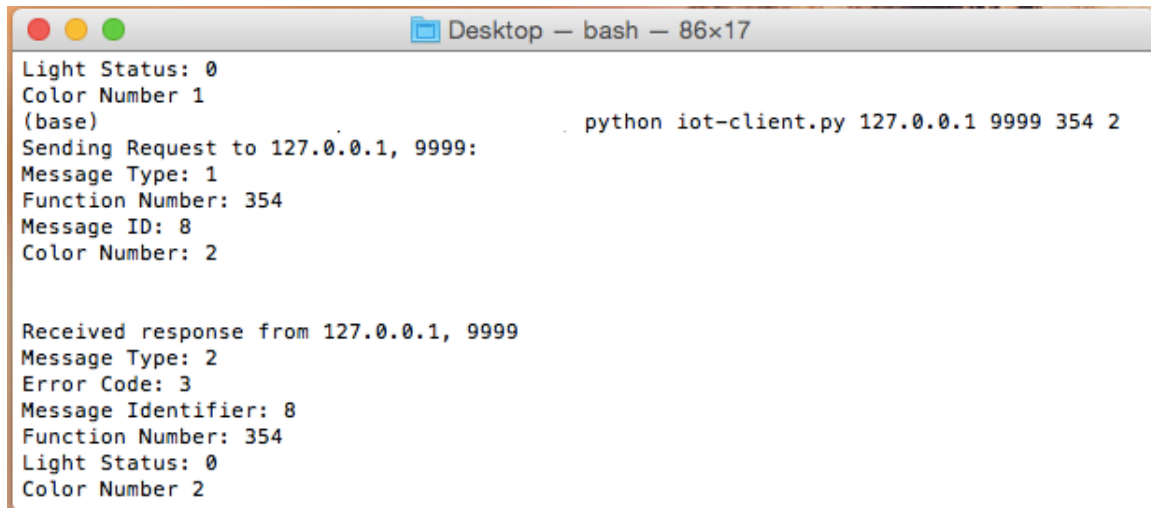
**Test Case 4:** Turn the light off (If the light bulb is already off, the operation should make no change)

A terminal window titled "Desktop — bash — 86x16" showing the execution of a Python script. The user enters "Color Number 3" and "(base)". The script sends a request to 127.0.0.1, 9999 with Message Type: 1, Function Number: 4, Message ID: 75, and Color Number: 1. The response from 127.0.0.1, 9999 shows Message Type: 2, Error Code: 0, Message Identifier: 75, Function Number: 4, Light Status: 0, and Color Number 1.

```
Desktop — bash — 86x16
Color Number 3
(base)
Sending Request to 127.0.0.1, 9999:
Message Type: 1
Function Number: 4
Message ID: 75
Color Number: 1

Received response from 127.0.0.1, 9999
Message Type: 2
Error Code: 0
Message Identifier: 75
Function Number: 4
Light Status: 0
Color Number 1
```

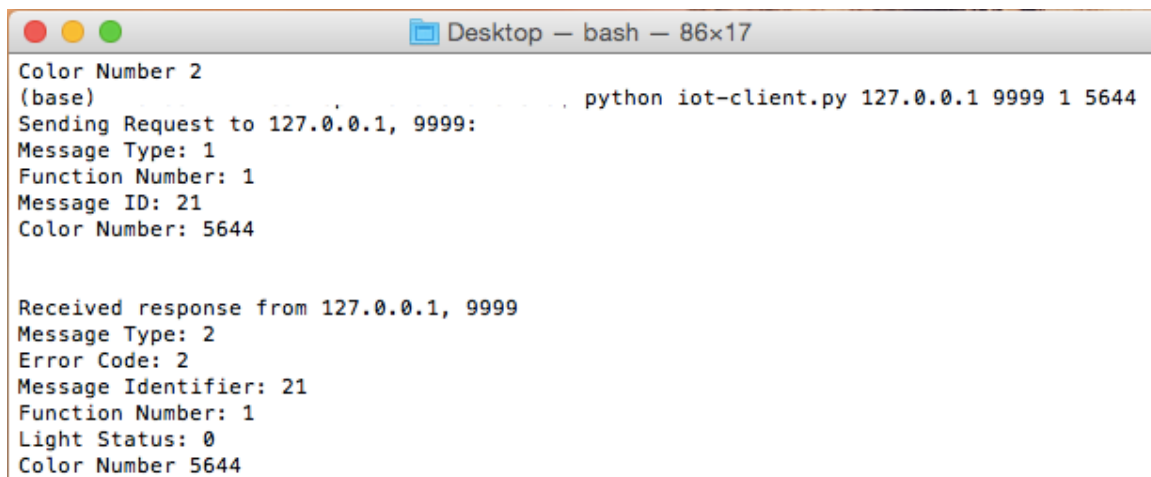
**Test Case 5:** Demonstrate operation when client sends a message with incorrect format to server

A terminal window titled "Desktop — bash — 86x17" showing the execution of a Python script. The script sends a request to 127.0.0.1 on port 9999 with message type 1, function number 354, and message ID 8. The response received has message type 2, error code 3, and message identifier 8.

```
Light Status: 0
Color Number 1
(base) python iot-client.py 127.0.0.1 9999 354 2
Sending Request to 127.0.0.1, 9999:
Message Type: 1
Function Number: 354
Message ID: 8
Color Number: 2

Received response from 127.0.0.1, 9999
Message Type: 2
Error Code: 3
Message Identifier: 8
Function Number: 354
Light Status: 0
Color Number 2
```

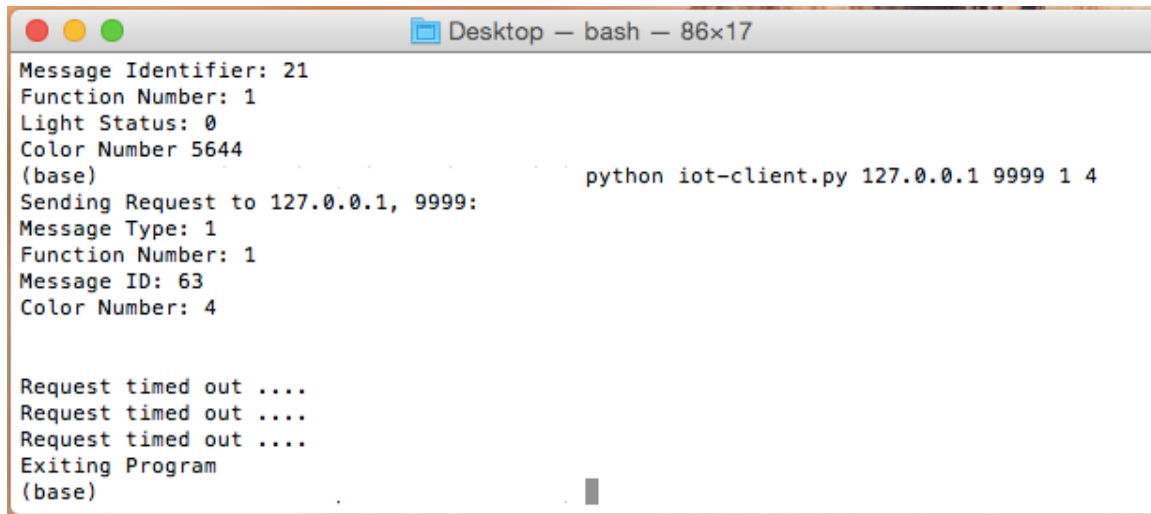
**Test Case 6:** Demonstrate operation when color not supported

A terminal window titled "Desktop — bash — 86x17" showing the execution of a Python script. The script sends a request to 127.0.0.1 on port 9999 with message type 1, function number 1, and message ID 21. The response received has message type 2, error code 2, and message identifier 21.

```
Color Number 2
(base) python iot-client.py 127.0.0.1 9999 1 5644
Sending Request to 127.0.0.1, 9999:
Message Type: 1
Function Number: 1
Message ID: 21
Color Number: 5644

Received response from 127.0.0.1, 9999
Message Type: 2
Error Code: 2
Message Identifier: 21
Function Number: 1
Light Status: 0
Color Number 5644
```

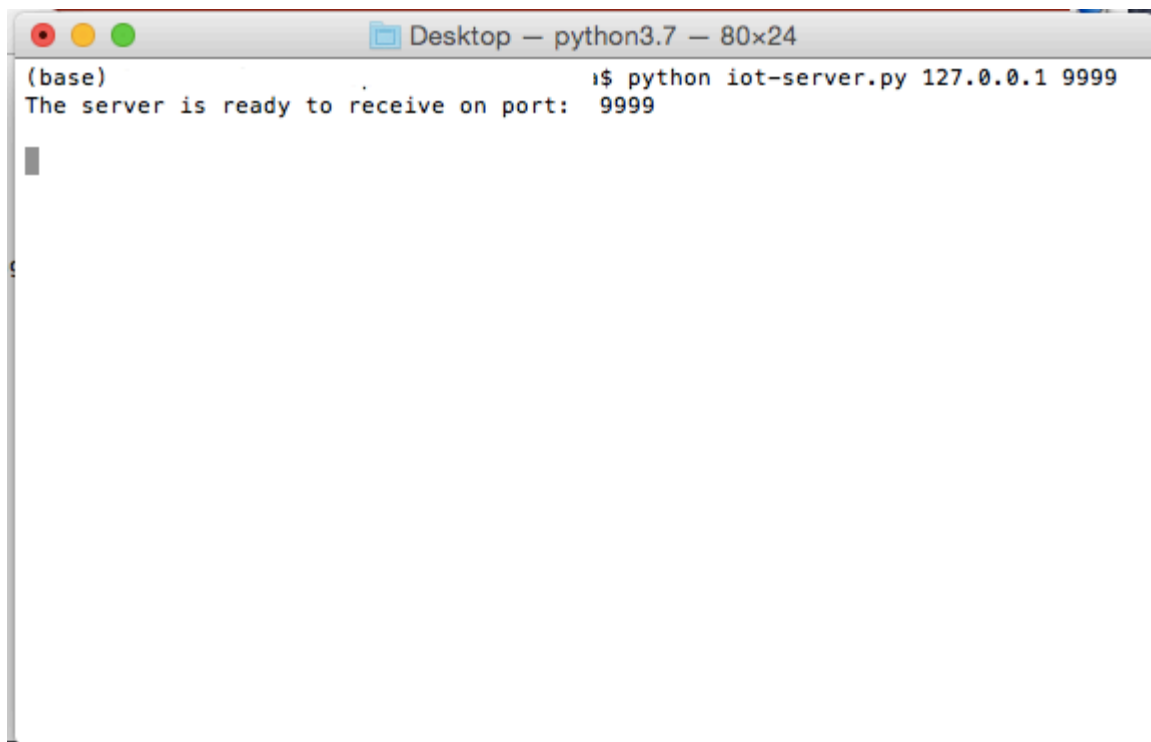
## Test Case 7: Demonstrate client operation when server not running



```
Desktop — bash — 86x17
Message Identifier: 21
Function Number: 1
Light Status: 0
Color Number 5644
(base) python iot-client.py 127.0.0.1 9999 1 4
Sending Request to 127.0.0.1, 9999:
Message Type: 1
Function Number: 1
Message ID: 63
Color Number: 4

Request timed out ....
Request timed out ....
Request timed out ....
Exiting Program
(base)
```

## Server:



```
Desktop — python3.7 — 80x24
(base) $ python iot-server.py 127.0.0.1 9999
The server is ready to receive on port: 9999
```