The client will perform the following functions:

1. Read in 3 arguments from command line
    a. IP address of the server
    b. Port of the server
    c. Hostname
    d. Color (see valid colors below)
2. Send request to the server using the message format specified later below
3. Wait for response using 1 second timeout period
    a. If response arrives within the specified time, the lightbulb should have changed color**.** You can simply simulate it turning green by printing out the lightbulb turns green.
    b. If not, resend the message up to 3 times before exiting the program.

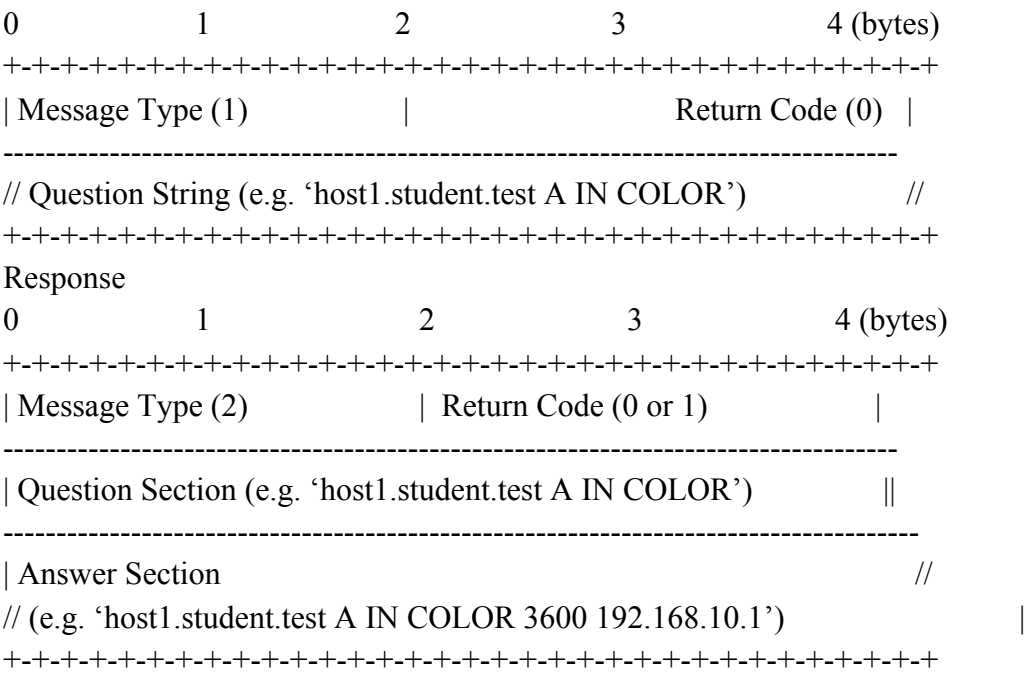
The server will perform the following functions:

1. Read in 2 arguments from command line
    a. IP address of the server
    b. Port of the server
2. Get ready to receive a response from the client.
3. Read in a dns-master.txt file. (Contains your own set of hostnames, type, **color**, ip address, etc.) Ex: "host1.student.test A IN Blue … ".
4. Store the resource record in data structure in main memory suitable for searching
5. Respond to request from the client using the message format specified later below
6. If the server receives a valid request, change the color according to the color specified (if color is valid too).
7. Return error if queried does not exist in the domain. If the color is not supported, print out the color is not supported.
8. The program should still work if the dns-master.txt file is modified.

Additional Clarifications:

1. Printing out the color should be done on the client side. If you receive a response back from the server, print out "The lightbulb is on, color: (your color)"
2. If you didn't receive a response back "The lightbulb is off, no color".
3. If you didn't receive a response back after attempting to send the request up to 3 times, you also need to print out "The light bulb is off, no color".
4. Light bulb is off by default.
5. If you want to turn off the lightbulb, you can send the request color Black to turn the lightbulb off. Otherwise, sending a request for any other colors should turn it on with that color.
6. The color Blue, Green, Yellow is valid and lightbulb is on. Black is off. Any other color is not supported and will display Red after telling the client the color isn't supported.

Request



Response

Message Type (16 bits): 1 on request; 2 on response

Return Code (16 bits) : 0 on request ; in response, 0 if name found, 1 if name does not exist
You can use this to determine whether the lights turn on or off.

Question Section (Variable length) In request, String carrying Question in the form of a DNS resource record containing hostname, ‘A’ and ‘IN’ separated by a single space e.g. ‘host1.student.test A IN COLOR’); Echoed back in server response

Answer Section (variable length): In request, there is no answer section. In response, the server includes the DNS record containing the IP address of the hostname in the request. e.g. ‘host1.student.test A IN COLOR 3600 192.168.10.1’). Empty, if not known.

COLOR represents the color of your choice.

After printing out the question and answer section, you print out whether or not the light turned on/off along with the color.