DNS Lookup (Client-Side Program) Report

1. Java Program Code (09_7315_dnsLookUp.java)

```java
// 09_7315_dnsLookUp.java
// Author: Ashish Kumar
// Roll No: 7315
// Class: TE Computer (B)
// Subject: Computer Networks and Security
// Assignment 9: DNS Lookup using Java

import java.net.InetAddress;
import java.net.UnknownHostException;
import java.util.Scanner;

class DNSLookup {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("===== DNS Lookup Program =====");
        System.out.print("Enter an IP address or hostname: ");
        String input = scanner.nextLine().trim();

        if (isIPAddress(input)) {
            try {
                InetAddress inet = InetAddress.getByName(input);
                System.out.println("----------------------------------");
                System.out.println("IP Address   : " + input);
                System.out.println("Host Name    : " + inet.getCanonicalHostName());
                System.out.println("----------------------------------");
            } catch (UnknownHostException e) {
                    System.out.println("Error: Could not resolve hostname for IP: " +
input);
            }
        } else {
            try {
                InetAddress inet = InetAddress.getByName(input);
                System.out.println("----------------------------------");
                System.out.println("Host Name    : " + input);
                System.out.println("IP Address   : " + inet.getHostAddress());
                System.out.println("----------------------------------");
            } catch (UnknownHostException e) {
                    System.out.println("Error: Could not resolve IP for hostname: " +
input);
            }
```

```
        }

        scanner.close();

    }


    private static boolean isIPAddress(String input) {

        return input.matches("\\b(?:\\d{1,3}\\.){3}\\d{1,3}\\b");

    }

}
```

2. Execution Outputs and Wireshark Capture

```
1068 156.750622   192.168.204.107    192.168.204.62      DNS       74 Standard query 0xc87c A www.google.com
1069 156.750796   192.168.204.107    192.168.204.62      DNS       74 Standard query 0x4e06 AAAA www.google.com
1070 156.776831   192.168.204.62     192.168.204.107     DNS       90 Standard query response 0xc87c A www.google.com A 142.250.192.100
1071 156.777342   192.168.204.62     192.168.204.107     DNS      102 Standard query response 0x4e06 AAAA www.google.com AAAA 2404:6800:4009:829::2004
```

```
3414 576.538076   192.168.204.107     192.168.204.62      DNS       80 Standard query 0x150b PTR 8.8.8.8.in-addr.arpa
3415 576.575882   2409:40c2:1043:d419… 2409:40c2:1043:d419… DNS     100 Standard query 0x150b PTR 8.8.8.8.in-addr.arpa
3416 576.576029   192.168.204.62      192.168.204.107     DNS      104 Standard query response 0x150b PTR 8.8.8.8.in-addr.arpa PTR dns.google
3417 576.578369   2409:40c2:1043:d419… 2409:40c2:1043:d419… DNS     124 Standard query response 0x150b PTR 8.8.8.8.in-addr.arpa PTR dns.google
3418 576.586227   192.168.204.107     192.168.204.62      DNS       70 Standard query 0xb94d A dns.google
3419 576.586998   192.168.204.107     192.168.204.62      DNS       70 Standard query 0x0f0f AAAA dns.google
3420 576.615384   192.168.204.62      192.168.204.107     DNS      102 Standard query response 0xb94d A dns.google A 8.8.8.8 A 8.8.4.4
3421 576.616162   192.168.204.62      192.168.204.107     DNS      126 Standard query response 0x0f0f AAAA dns.google AAAA 2001:4860:4860::8888 AAAA 2001:4860:4860::8844
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS

psssa@ASHISH-HP-VICTUS-i7:/mnt/c/Users/psssa/OneDrive/Documents/ACADEMIC TE/CNSL$ javac 09_7315_dnsLookUp.java
psssa@ASHISH-HP-VICTUS-i7:/mnt/c/Users/psssa/OneDrive/Documents/ACADEMIC TE/CNSL$ java DNSLookup
===== DNS Lookup Program =====
Enter an IP address or hostname: www.google.com
------------------------------------
Host Name    : www.google.com
IP Address   : 142.250.192.100
------------------------------------
psssa@ASHISH-HP-VICTUS-i7:/mnt/c/Users/psssa/OneDrive/Documents/ACADEMIC TE/CNSL$ java DNSLookup
===== DNS Lookup Program =====
Enter an IP address or hostname: 8.8.8.8
------------------------------------
IP Address   : 8.8.8.8
Host Name    : dns.google
------------------------------------
psssa@ASHISH-HP-VICTUS-i7:/mnt/c/Users/psssa/OneDrive/Documents/ACADEMIC TE/CNSL$
```