Ex 4:

Simulation of DNS using UDP sockets.

Program:

DNS Server:

```
package computernetworks;
import java.net.*;
import java.util.*;
public class DNSServer {
 public static void main(String[] args) throws Exception {
    DatagramSocket serverSocket = new DatagramSocket(9876);
    byte[] receiveData = new byte[1024];
    byte[] sendData;
    // Sample DNS records
    Map<String, String> dnsTable = new HashMap<>();
    dnsTable.put("google.com", "142.250.192.14");
    dnsTable.put("yahoo.com", "98.137.11.163");
    dnsTable.put("example.com", "93.184.216.34");
    System.out.println("DNS Server is running...");
    while (true) {
       DatagramPacket receivePacket = new DatagramPacket(receiveData,
receiveData.length);
       serverSocket.receive(receivePacket);
       String domain = new String(receivePacket.getData(), 0, receivePacket.getLength());
       System.out.println("Received request for: " + domain);
       String ip = dnsTable.getOrDefault(domain, "Domain not found");
       sendData = ip.getBytes();
       InetAddress clientIP = receivePacket.getAddress();
       int clientPort = receivePacket.getPort();
```

```
        DatagramPacket sendPacket = new DatagramPacket(sendData, sendData.length,
clientIP, clientPort);
        serverSocket.send(sendPacket);
    }
 }
}
```

Output:

DNS Server is running...

Received request for: google.com

Received request for: example.com

Received request for: unknown.com

DNS Client:

```
package computernetworks;
import java.net.*;
import java.util.Scanner;
public class DNSClient {
 public static void main(String[] args) throws Exception {
    DatagramSocket clientSocket = new DatagramSocket();
    InetAddress serverAddress = InetAddress.getByName("localhost");
    byte[] sendData;
    byte[] receiveData = new byte[1024];
    Scanner scanner = new Scanner(System.in);
    System.out.print("Enter domain name to resolve: ");
    String domain = scanner.nextLine();
    sendData = domain.getBytes();
    DatagramPacket sendPacket = new DatagramPacket(sendData, sendData.length,
serverAddress, 9876);
    clientSocket.send(sendPacket);
    DatagramPacket receivePacket = new DatagramPacket(receiveData, receiveData.length);
```

```
        clientSocket.receive(receivePacket);
        String ip = new String(receivePacket.getData(), 0, receivePacket.getLength());
        System.out.println("IP Address: " + ip);
        clientSocket.close();
        scanner.close();
    }
}
```

Output:

Enter domain name to resolve: google.com
IP Address: 142.250.192.14

Enter domain name to resolve: example.com
IP Address: 93.184.216.34

Enter domain name to resolve: unknown.com
IP Address: Domain not found