**DHCP SERVER**

import java.io.\*;

import java.net.\*;

public class IPAddressServer {

private static final int PORT = 12345; // Port number for the server

private static final String[] ipAddressPool = {

"192.168.1.1", "192.168.1.2", "192.168.1.3", "192.168.1.4"

};

private static int availableCount = ipAddressPool.length;

public static void main(String[] args) {

try (ServerSocket serverSocket = new ServerSocket(PORT)) {

System.out.println("Server is listening on port " + PORT);

while (true) {

try (Socket socket = serverSocket.accept();

PrintWriter out = new PrintWriter(socket.getOutputStream(), true);

BufferedReader in = new BufferedReader(new InputStreamReader(socket.getInputStream()))) {

System.out.println("Client connected");

// Process client request

String request = in.readLine();

if ("REQUEST\_IP".equals(request)) {

String allocatedIp = allocateIpAddress();

out.println(allocatedIp);

} else {

out.println("Invalid request");

}

} catch (IOException e) {

System.out.println("Error handling client: " + e.getMessage());

}

}

} catch (IOException e) {

System.out.println("Server error: " + e.getMessage());

}

}

private static synchronized String allocateIpAddress() {

if (availableCount == 0) {

return "No IP addresses available";

}

String allocatedIp = ipAddressPool[0];

// Shift elements to the left

for (int i = 0; i < availableCount - 1; i++) {

ipAddressPool[i] = ipAddressPool[i + 1];

}

ipAddressPool[availableCount - 1] = null;

availableCount--;

return allocatedIp;

}

}

**DHCP Client**

import java.io.\*;

import java.net.\*;

public class IPAddressClient {

private static final String SERVER\_ADDRESS = "localhost"; // Server address

private static final int PORT = 12345; // Port number for the server

public static void main(String[] args) {

try (Socket socket = new Socket(SERVER\_ADDRESS, PORT);

PrintWriter out = new PrintWriter(socket.getOutputStream(), true);

BufferedReader in = new BufferedReader(new InputStreamReader(socket.getInputStream()))) {

// Send request to server

out.println("REQUEST\_IP");

// Receive response from server

String response = in.readLine();

System.out.println("Received IP address: " + response);

} catch (IOException e) {

System.out.println("Client error: " + e.getMessage());

}

}

}