NAME: SHASHWAT SHAH
SAP ID: 60004220126
DIV/BATCH: C22

DISTRIBUTED COMPUTING (DC)
EXPERIMENT 06

AIM: To implement Name Resolution Protocol using JAVA.

CODE:
DNS_Server.java

```
import java.net.*;
import java.util.HashMap;

public class DNS_Server {
   public static void main(String[] args) {
      try {
         // Create a socket to listen on port 9876
         DatagramSocket serverSocket = new DatagramSocket(9876);

         // DNS records: Domain name -> IP address mapping
         HashMap<String, String> dnsRecords = new HashMap<>();
         dnsRecords.put("google.com", "142.250.182.78");
         dnsRecords.put("yahoo.com", "98.138.219.231");
         dnsRecords.put("example.com", "93.184.216.34");
         dnsRecords.put("facebook.com", "157.240.229.35");

         byte[] receiveBuffer = new byte[1024];
         byte[] sendBuffer;

         System.out.println("DNS Server is running...");

         while (true) {
            // Receive request from client
            DatagramPacket receivePacket = new DatagramPacket(receiveBuffer, receiveBuffer.length);
            serverSocket.receive(receivePacket);

            String domainName = new String(receivePacket.getData(), 0, receivePacket.getLength());
            System.out.println("Request received for domain: " + domainName);

            // Get IP address from DNS records
            String ipAddress = dnsRecords.getOrDefault(domainName, "Domain not found");

            // Send response to client
            sendBuffer = ipAddress.getBytes();
            InetAddress clientAddress = receivePacket.getAddress();
            int clientPort = receivePacket.getPort();

            DatagramPacket sendPacket = new DatagramPacket(sendBuffer, sendBuffer.length,
clientAddress, clientPort);
            serverSocket.send(sendPacket);
            serverSocket.close();
```

```
        }
      } catch (Exception e) {
        System.out.println("Error: " + e.getMessage());
      }
    }
}
```

DNS_Client.java

```
import java.net.*;
import java.util.Scanner;


public class DNS_Client {
   public static void main(String[] args) {
      try {
         // Create a socket to send and receive data
         DatagramSocket clientSocket = new DatagramSocket();
         InetAddress serverAddress = InetAddress.getByName("localhost");
         Scanner scanner = new Scanner(System.in);


         byte[] sendBuffer;
         byte[] receiveBuffer = new byte[1024];


         System.out.print("Enter domain name to resolve: ");
         String domainName = scanner.nextLine();


         // Send domain name to server
         sendBuffer = domainName.getBytes();
         DatagramPacket sendPacket = new DatagramPacket(sendBuffer, sendBuffer.length,
serverAddress, 9876);
         clientSocket.send(sendPacket);


         // Receive resolved IP address from server
         DatagramPacket receivePacket = new DatagramPacket(receiveBuffer, receiveBuffer.length);
         clientSocket.receive(receivePacket);
```

```
            String ipAddress = new String(receivePacket.getData(), 0, receivePacket.getLength());
            System.out.println("Resolved IP Address: " + ipAddress);

            // Close resources
            clientSocket.close();
            scanner.close();
        } catch (Exception e) {
            System.out.println("Error: " + e.getMessage());
        }
    }
}
```

OUTPUT:

```
Enter domain name to resolve: google.com
Resolved IP Address: 142.250.182.78
```