Exercise 4: Address Resolution Protocol (ARP).

AIM: Simulate ARP using socket programming.

ALGORITHM
Server should perform the following:

1.   Consider the server as a host or a router.

2.   Enter hosts/routers' IP address and MAC address.

3.   Listen for any number of client (for broadcasting purpose).

4.   Enter the packet details received from a host or its own packet to send to a destination.

         The details are:

                   i.   Source IP address
                  ii.   Source MAC address
                 iii.   Destination IP address
                  iv.   16-bit data

Develop an ARP Request packet which is to be broadcasted to all clients. Query packet should contain

ARPOperation| SourceMAC | SourceIP | DestinationMAC | DestinationIP

5.   When an ARP Reply is received with the Destination MAC address, send the packet to the corresponding destination.

6.   Also check the validity of IP and MAC address.

Client should do the following:

1.   Can have any number of clients (depends on the backlog).

2.   Enter the clients own IP and MAC.

3.   When an ARP Request packet is received check whether the Destination IP is its own IP.

4.   If not no reply.

5.   If yes respond with ARP Reply packet.

         ARPOperation|SourceMAC | SourceIP | DestinationMAC | DestinationIP

6.   Then receive the packet from the server and display it.

Sample Input and Output
Server

Enter the details of packet received.

Destination IP :155.157.65.128

Source IP   :123.128.34.56

Source MAC   :AF-45-E5-00-97-12

16 bit data   :1011110000101010

Developing ARP Request packet

1|AF-45-E5-00-97-12 | 123.128.34.56 |00-00-00-00-00-00 | 155.157.65.128

The ARP Request packet is broadcasted.

Waiting for ARP Reply...

ARP Reply received

2 |45-DA-62-21-1A-B2 | 155.157.65.128 |123.128.34.56 | AF-45-E5-00-97-12

Sending the data packet to   : 45-DA-62-21-1A-B2

Client 1

Enter the IP address   : 165.43.158.158

Enter the Mac address: 09-DF-90-26-6C-09

ARP Request Received:

 1| AF-45-E5-00-97-12 | 123.128.34.56 |00-00-00-00-00-00 | 155.157.65.128

IP address does not match.

Client 2

Enter the IP address   : 155.157.65.128

Enter the Mac address: 45-DA-62-21-1A-B2

ARP Request Received:

1|AF-45-E5-00-97-12 | 123.128.34.56 |00-00-00-00-00-00 | 155.157.65.128

IP address matches

ARP Reply Sent:

2 |45-DA-62-21-1A-B2 | 155.157.65.128 |123.128.34.56 | AF-45-E5-00-97-12

Received data Packet from   : AF-45-E5-00-97-12

Client 3

Enter the IP address   : 15.143.158.18

Enter the Mac address   : 19-0F-01-63-C7-D4

ARP Request Received   :

1|AF-45-E5-00-97-12 | 123.128.34.56 |00-00-00-00-00-00 | 155.157.65.128

IP address does not match.