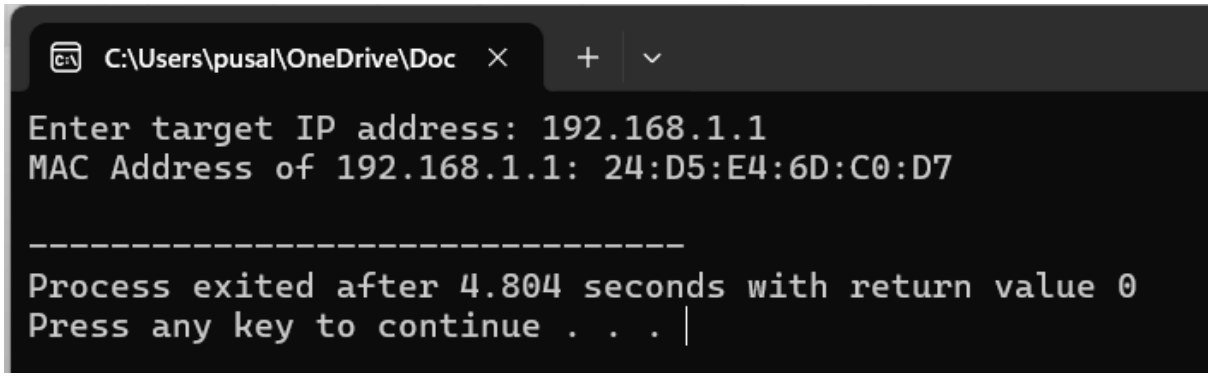
31. Implementing ARP protocols in java/C.

```
#include <stdio.h>
#include <stdlib.h>
#include <winsock2.h>
#include <windows.h>  // Required before iphlpapi.h
#include <iphlpapi.h>

#pragma comment(lib, "ws2_32.lib")   // Link Winsock library
#pragma comment(lib, "iphlpapi.lib") // Link IP Helper API

void getMACAddress(const char *ipAddress) {
    DWORD dwRetVal;
    ULONG MacAddr[2];  // Buffer for the MAC address
    ULONG PhysAddrLen = 6;  // MAC address length

    memset(MacAddr, 0, sizeof(MacAddr));  // Initialize buffer

    struct in_addr DestIP;
    DestIP.s_addr = inet_addr(ipAddress);

    dwRetVal = SendARP(DestIP.s_addr, 0, MacAddr, &PhysAddrLen);

    if (dwRetVal == NO_ERROR && PhysAddrLen >= 6) {
        unsigned char *mac = (unsigned char *)MacAddr;
        printf("MAC Address of %s: %02X:%02X:%02X:%02X:%02X:%02X\n",
               ipAddress, mac[0], mac[1], mac[2], mac[3], mac[4], mac[5]);
    } else {
        printf("Failed to get MAC Address for %s. Ensure the IP is on the same network.\n", ipAddress);
    }
}

int main() {
    WSADATA wsaData;
    if (WSAStartup(MAKEWORD(2, 2), &wsaData) != 0) {
        printf("WSAStartup failed.\n");
        return 1;
    }

    char targetIP[16];
    printf("Enter target IP address: ");
    scanf("%15s", targetIP);  // Ensures input safety

    getMACAddress(targetIP);

    WSACleanup();
    return 0;
}
```


C:\Users\pusal\OneDrive\Doc
Enter target IP address: 192.168.1.1
MAC Address of 192.168.1.1: 24:D5:E4:6D:C0:D7

Process exited after 4.804 seconds with return value 0
Press any key to continue . . .