3.Implement system calls

What is a System Call?

A system call is a mechanism by which user-level applications request services from the operating system's kernel. These calls allow programs to perform low-level operations such as creating processes, accessing hardware, managing memory, and performing network communications.

SYSTEM CALL IMPLEMENTATION – accept() in Windows Server 2022

In Windows Server 2022, the accept() system call is a key function used in network programming. It is part of the Windows Sockets API (Winsock) and allows a server application to accept an incoming connection from a client. This system call creates a new socket specifically for communicating with the connected client, while the original socket continues to listen for new connections. It is commonly used in server-side applications like web servers and chat servers. Below is a simple

```
#include <winsock2.h>

#include <stdio.h>


#pragma comment(lib, "ws2_32.lib")


int main() {

    WSADATA wsaData;

    SOCKET serverSocket, clientSocket;

    struct sockaddr_in server, client;
```

```
int clientSize = sizeof(client);

// Step 1: Initialize Winsock
WSAStartup(MAKEWORD(2, 2), &wsaData);

// Step 2: Create a socket
serverSocket = socket(AF_INET, SOCK_STREAM, 0);

// Step 3: Setup the server address
server.sin_family = AF_INET;
server.sin_addr.s_addr = INADDR_ANY;
server.sin_port = htons(1234);

// Step 4: Bind the socket
bind(serverSocket, (struct sockaddr*)&server, sizeof(server));

// Step 5: Start listening for connections
listen(serverSocket, 1);
printf("Server is waiting for connections...\n");

// Step 6: Accept a connection
```

```
    clientSocket = accept(serverSocket, (struct sockaddr*)&client, &clientSize);
    if (clientSocket != INVALID_SOCKET) {
        printf("Client connected!\n");
    }

    // Step 7: Clean up
    closesocket(clientSocket);
    closesocket(serverSocket);
    WSACleanup();
    return 0;
}
```

I implemented a simple program where the server listens on port 1234 using the accept() system call. When a client connects, the server prints a confirmation message like “Client connected!” to show the connection was successful. After that, both the client and server sockets are closed properly to clean up resources. This helped me understand how servers handle client connections in Windows using Winsock. It’s a practical example of how accept() works in real network communication.