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Distributed System (CS17201)
B.Tech (CSE) – VII Sem Lab 7

Q1. Implement RPC mechanism for a file transfer across a network in 'C'.
Code :
Client.c

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <netinet/in.h>
#include <arpa/inet.h>

#define SERVER_IP "127.0.0.1"  // Change this to the server's IP address
#define PORT 12345

void receive_file(int server_socket) {
    FILE *file = fopen("received_file.txt", "wb");
    if (file == NULL) {
        perror("File create error");
        exit(1);
    }

    char buffer[1024];
    int bytesRead;

    while ((bytesRead = recv(server_socket, buffer, sizeof(buffer), 0)) > 0) {
        fwrite(buffer, 1, bytesRead, file);
    }

    fclose(file);
}

int main() {
    int client_socket;
```

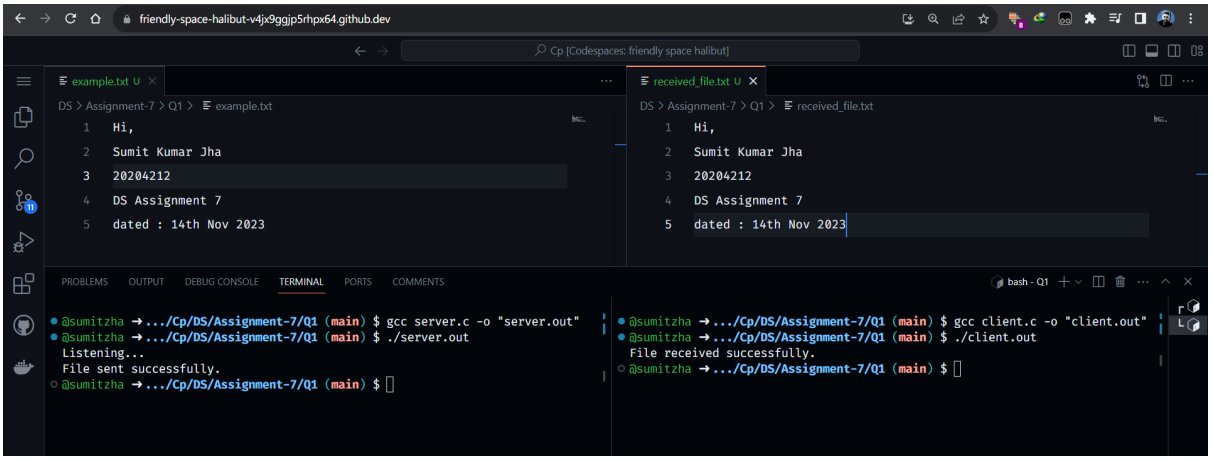
```
    struct sockaddr_in server_addr;

    client_socket = socket(AF_INET, SOCK_STREAM, 0);
    if (client_socket < 0) {
        perror("Socket creation error");
        exit(1);
    }

    server_addr.sin_family = AF_INET;
    server_addr.sin_port = htons(PORT);
    server_addr.sin_addr.s_addr = inet_addr(SERVER_IP);

    if (connect(client_socket, (struct sockaddr*)&server_addr,
sizeof(server_addr)) < 0) {
        perror("Connection error");
        exit(1);
    }

    receive_file(client_socket);
    printf("File received successfully.\n");

    close(client_socket);
    return 0;
}
```

Server.c

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <netinet/in.h>
#include <arpa/inet.h>

#define PORT 12345

void transfer_file(int client_socket) {
    FILE *file = fopen("example.txt", "rb");
    if (file == NULL) {
        perror("File open error");
        exit(1);
```

```
    }

    char buffer[1024];
    size_t bytesRead;

    while ((bytesRead = fread(buffer, 1, sizeof(buffer), file)) > 0) {
        send(client_socket, buffer, bytesRead, 0);
    }

    fclose(file);
}

int main() {
    int server_socket, client_socket;
    struct sockaddr_in server_addr, client_addr;
    socklen_t addr_size;

    server_socket = socket(AF_INET, SOCK_STREAM, 0);
    if (server_socket < 0) {
        perror("Socket creation error");
        exit(1);
    }

    server_addr.sin_family = AF_INET;
    server_addr.sin_port = htons(PORT);
    server_addr.sin_addr.s_addr = INADDR_ANY;

    if (bind(server_socket, (struct sockaddr*)&server_addr,
sizeof(server_addr)) < 0) {
        perror("Binding error");
        exit(1);
    }

    if (listen(server_socket, 10) == 0) {
        printf("Listening...\n");
    } else {
        perror("Listening error");
        exit(1);
    }
```

```
    addr_size = sizeof(client_addr);
    client_socket = accept(server_socket, (struct sockaddr*)&client_addr,
&addr_size);

    transfer_file(client_socket);
    printf("File sent successfully.\n");

    close(client_socket);
    close(server_socket);
    return 0;
}
```



Q2. Implement ‘Java RMI’ mechanism for accessing methods of remote systems.
Client.c

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <netinet/in.h>

int main() {
    int client_socket;
    struct sockaddr_in server_addr;

    client_socket = socket(AF_INET, SOCK_STREAM, 0);
    if (client_socket < 0) {
        perror("Socket creation error");
        exit(1);
    }

    server_addr.sin_family = AF_INET;
    server_addr.sin_port = htons(12345);
    server_addr.sin_addr.s_addr = INADDR_ANY;

    if (connect(client_socket, (struct sockaddr*)&server_addr,
sizeof(server_addr)) < 0) {
        perror("Connection error");
        exit(1);
    }

    int a = 5, b = 3, result;

    send(client_socket, &a, sizeof(a), 0);
    send(client_socket, &b, sizeof(b), 0);

    recv(client_socket, &result, sizeof(result), 0);

    printf("\nResult: %d\n", result);
    close(client_socket);
    return 0;
}
```

Server.c

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <netinet/in.h>

int add(int a, int b) {
    return a + b;
}

int main() {
    int server_socket, client_socket;
    struct sockaddr_in server_addr, client_addr;
    socklen_t addr_size;

    server_socket = socket(AF_INET, SOCK_STREAM, 0);
    if (server_socket < 0) {
        perror("Socket creation error");
        exit(1);
    }

    server_addr.sin_family = AF_INET;
    server_addr.sin_port = htons(12345);
    server_addr.sin_addr.s_addr = INADDR_ANY;

    if (bind(server_socket, (struct sockaddr*)&server_addr,
sizeof(server_addr)) < 0) {
        perror("Binding error");
        exit(1);
    }

    if (listen(server_socket, 10) == 0) {
        printf("Listening...\n");
    } else {
        perror("Listening error");
        exit(1);
    }
```

```
    addr_size = sizeof(client_addr);
    client_socket = accept(server_socket, (struct sockaddr*)&client_addr,
&addr_size);

    int a, b, result;
    recv(client_socket, &a, sizeof(a), 0);
    recv(client_socket, &b, sizeof(b), 0);

    result = add(a, b);
    send(client_socket, &result, sizeof(result), 0);

    close(client_socket);
    close(server_socket);
    return 0;
}
```