

1. Implement a **Router** to facilitate data switching between a sender and a receiver, assuming three clients are connected to the router. Utilize TCP sockets to establish communication among four processes: the Router functioning as the server and three client, all hosted on the same system. Ensure each client initializes a TCP connection with the server upon system startup, with clients assigned unique IDs (e.g., 1, 2, and 3). Define the data unit as a structured entity containing three fields: sender ID, receiver ID, and a string message. Incorporate a broadcasting feature where a receiver ID of 0 indicates that the message is sent to all clients, including the sender. For instance, a data unit may be represented as *(1, 2, "1 sends to 2")* or *(1, 0, "1 to all")*. Demonstrate the implementation with output matching the following provided example.

```
$ ./a.out
Please input the sender and the receiver: 1 2
Node 2 receives "1 sends to 2"
Please input the sender and the receiver: 1 0
Node 2 receives "1 sends to all"
Node 1 receives "1 sends to all"
Node 3 receives "1 sends to all"
```