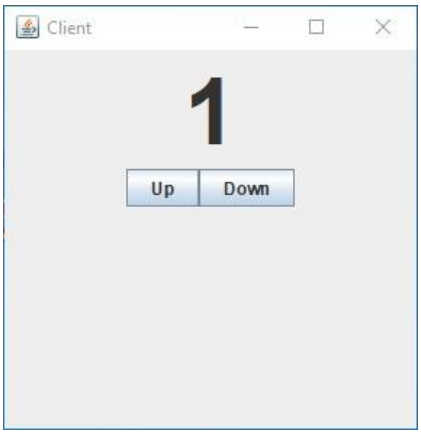
# COMP2396B Tutorial 9

**Java Web Socket server/clients communication and Multithreading.**

In this tutorial, we are going to create a system that supports one server and multiple clients. This system contains an integer counter in the server and allows clients to increment and decrement the counter. When the counter is updated by one client, the value displayed on all client programs will be updated accordingly.

**User-Interface**

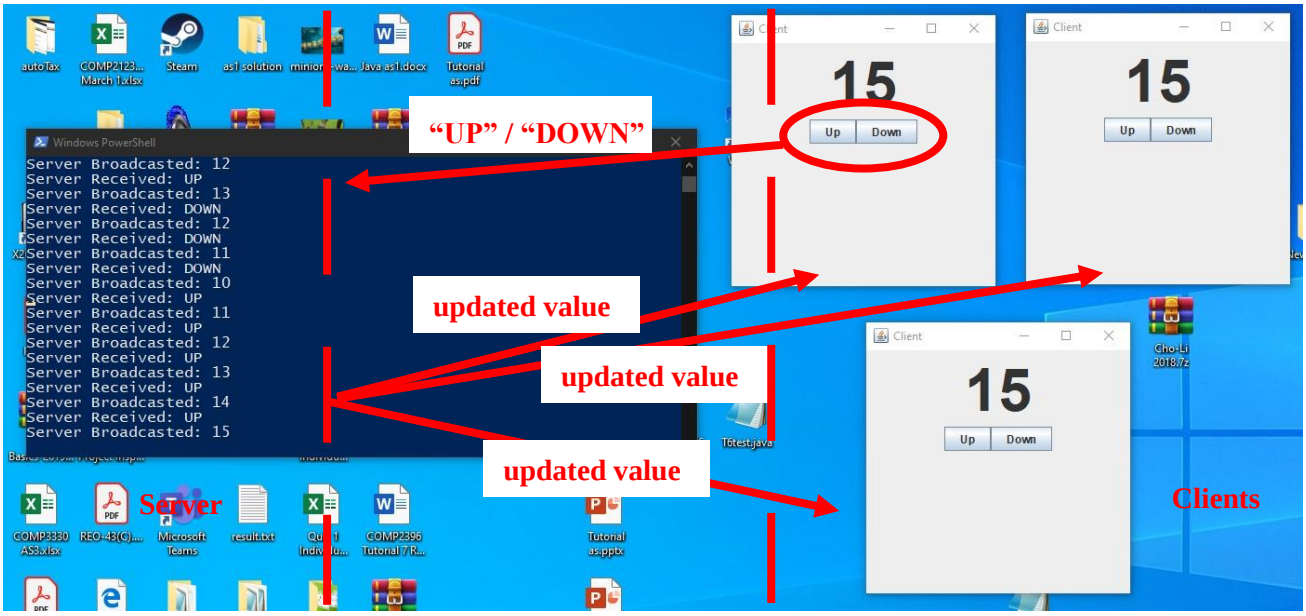
This is how the client program looks like. A label displays the value of the counter, which is received from the server. The "Up"/ "Down" buttons are used to send the "UP" command and the "DOWN" command to the server.




**Sever/clients communication protocol**

When the server received the "UP"/"DOWN" command. The server will increment/decrement the value accordingly and send the updated value to all connected clients.

1. One client sends the "UP" or "DOWN" command to the server.
2. The server updates the counter accordingly.
3. The server sends the updated value to all connected clients.


"UP" / "DOWN"
updated value
updated value
updated value
Server
Clients
Windows PowerShell
Server Broadcasted: 12
Server Received: UP
Server Broadcasted: 13
Server Received: DOWN
Server Broadcasted: 12
Server Received: DOWN
Server Broadcasted: 11
Server Received: DOWN
Server Broadcasted: 10
Server Received: UP
Server Broadcasted: 11
Server Received: UP
Server Broadcasted: 12
Server Received: UP
Server Broadcasted: 13
Server Received: UP
Server Broadcasted: 14
Server Received: UP
Server Broadcasted: 15
Client
15
Up
Down