

### **Average Response time:**

#### **Seller (1 instance | 10 instances | 100 instances):**

1. Create an account - 125.6 ms | 87.1 ms | 82.4 ms
2. Login - 206.5 ms | 165.9 ms | 159.3 ms
3. Logout - 165.6 ms | 130.4 ms | 132 ms
4. Get seller rating - 149.2 ms | 128.4 ms | 121.7 ms
5. Put an item for sale - 152 ms | 144.8 ms | 138.7 ms
6. Change the sale price - 164.4 ms | 148.1 ms | 145.7 ms
7. Remove an item - 97.3 ms | 90.8 ms | 89.2 ms
8. Display items - 330 ms | 294.5 ms | 302.8 ms

#### **Buyer (1 instance | 10 instances | 100 instances):**

1. Create an account - 121.3 ms | 82.6 ms | 85.8 ms
2. Login - 142.5 ms | 127.6 ms | 124.8 ms
3. Logout - 152.4 ms | 134.5 ms | 122.8 ms
4. Add item to the shopping cart - 260.4 ms | 241.6 ms | 238.3 ms
5. Remove item from the shopping cart - 164.7 ms | 147.3 ms | 139.7 ms
6. Clear the shopping cart - 126.6 ms | 110.4 ms | 106.9 ms
7. Display shopping cart - 123.1 ms | 108.9 ms | 103.6 ms
8. Provide feedback - 42.3 ms | 37.6 ms | 35.8 ms
9. Get seller rating - 98.5 ms | 77.4 ms | 74.9 ms
10. Search for Item - 540.6 ms | 410.9 ms | 390.2 ms
11. Get Purchase History - 191.7 ms | 165.9 ms | 158.9 ms

With the increase in no of clients, since both servers used threading to handle multiple clients and provide response, there is a trend of faster response time for many of the functions.

### **Average Throughputs:**

1. Seller Server:
  - a. 1 instance of client - 6.39 operations per second
  - b. 10 instances of client - 9.81 operations per second
  - c. 100 instances of client - 10.99 operations per second
2. Buyer Server:
  - a. 1 instance of client - 5.99 operations per second
  - b. 10 instances of client - 8.39 operations per second
  - c. 100 instances of client - 9.48 operations per second

We can observe that with an increase in the number of clients, both the servers are able to perform more operations per second, thus increasing the throughput.

This increase in throughput is due to the ability of using multithreading while responding to client requests.