

System Programming

2024, Spring

Final |

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- **System Design**

- **Server Design**

- **Initialization and Resource Management**

- initialize_order_queue(int capacity): Initializes an order queue with a specified capacity.
 - initialize_ready_order_queue(int capacity): Initializes a queue for ready orders with a specified capacity.
 - initialize_cooks(int cook_pool_size): Initializes an array of cooks with default values.
 - initialize_delivery_people(int num_people): Initializes an array of delivery people with default values.

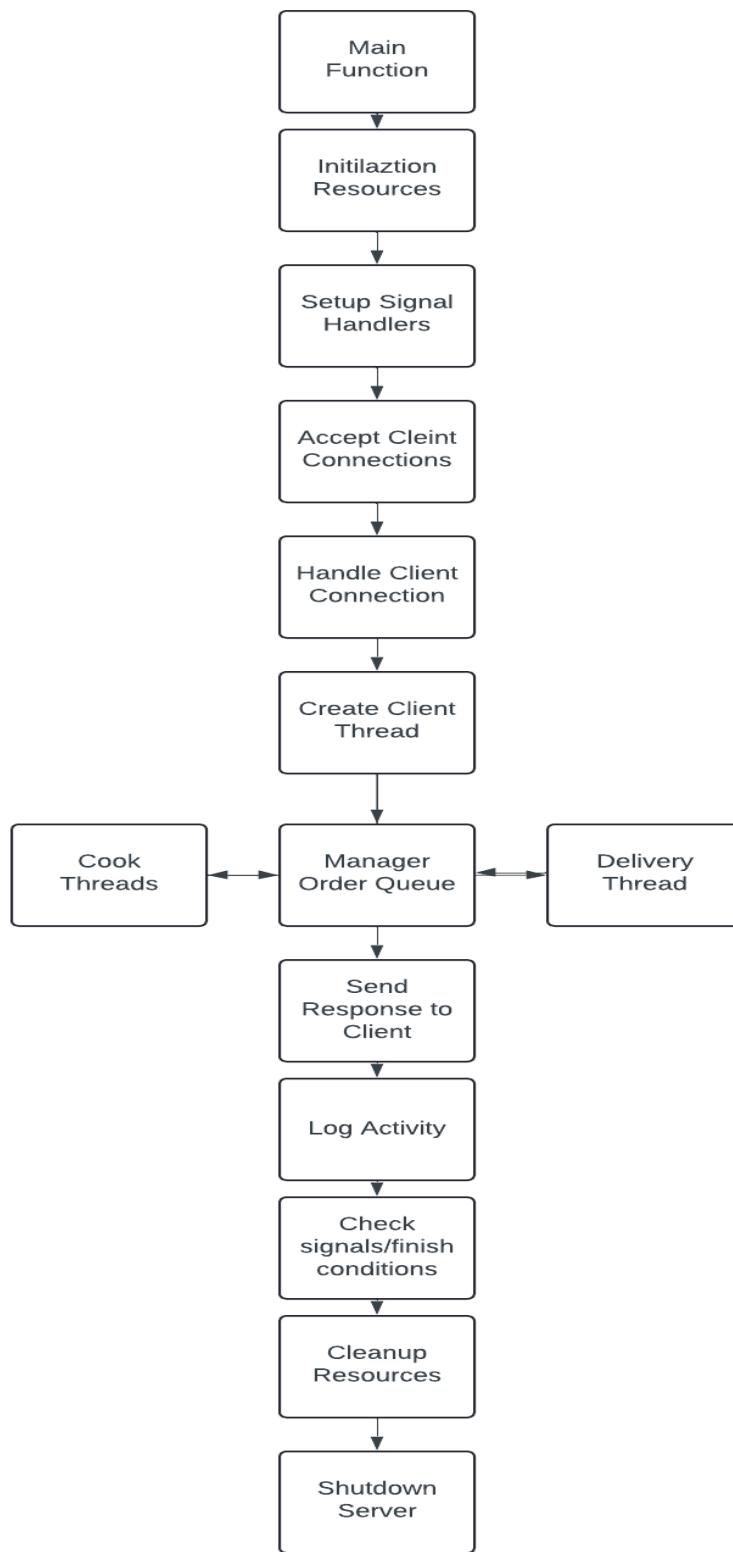
- **Order Handling**

- add_order_to_queue(OrderTask task): Adds a new order to the order queue, logging the event and signaling waiting threads.
 - add_ready_order_to_queue(OrderTask task): Adds a ready order to the queue, facilitating delivery preparation.
 - handle_new_order(int client_sock, Order order): Processes incoming orders from clients, assigns tasks to cooks, and logs the activity.
 - handle_order_ready(int client_sock, int order_id): Manages orders ready for delivery, removing them from the ready order queue and notifying the client.

- **Client Interaction**

- client_handler(void *arg): Thread function to handle client connections, continuously receiving and processing orders.

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- **Communication and Response**
 - send_response(int client_sock, const char *message): Sends formatted responses to clients, ensuring proper communication and error handling.
 - log_activity(int order_id, const char *message): Logs server activities to a file, utilizing file locks for synchronization and preventing data corruption.
 - **Signal Handling and Shutdown**
 - setup_signal_handlers(): Installs signal handlers for SIGINT and SIGTERM, ensuring graceful shutdown and resource cleanup.
 - handle_sigint(int sig): Signal handler for SIGINT, initiates cleanup procedures and orderly shutdown of server operations.
 - cleanup(): Frees allocated memory, cancels active threads, closes file descriptors, and releases resources upon server shutdown.
 - **Performance Analysis and Reporting**
 - give_promotion(): Provides detailed performance metrics at server shutdown, including the most productive cooks and delivery personnel based on cooked orders and delivered packages.
 - simulate_order_preparation(): Demonstrates a computational task (pseudo-inverse matrix calculation) to measure performance and ensure optimal resource allocation.
 - **Workflow**
 - First of all, the system creates and initializes variables-threads.
 - After initialization system run on 4 threads
 - Cook
 - If there is a new order it gets order and prepare it.
 - There is a lot of control: Important rules
 - If cook has a order in oven and if oven is full, it waits to cook and do not prepare another. It has a six slots.
 - Delivery
 - Delivery person get package from manager and deliver it.
 - Manager
 - Gets order and place it.
 - Main Function
 - **Workflow Chart**
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- o **Client Design**

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- The `client.c` program is a client application that connects to a server, generates multiple client instances, sends orders to the server, and handles responses from the server. It supports graceful shutdown on receiving specific signals.

- **Components**

- Client Structure (`Client`): Represents individual clients with unique IDs and coordinates `(x, y)`.
- Connection Structure (`Connection`): Manages the socket and server address information for establishing the connection to the server.
- Request and Response Structures (`Request` and `Response`): Define the formats for sending requests to and receiving responses from the server.
- Global Variables:
 - `num_clients`: Number of clients to be generated.
 - `is_finished`: A flag to indicate the completion of client operations.
 - `clients[]`: Array of `Client` structures holding client details.
 - `connection`: An instance of `Connection` structure for server communication.
 - `keep_running`: A volatile flag used for signal handling to manage the running state of the application.
- Mutex: `order_mutex` to protect shared resources, ensuring thread-safe operations.

- **Main Function**

- Parses command-line arguments
- Sets up signal handlers
- Call other Functions

- **Signal Handling:**

- `setup_signal_handlers()`: Configures handlers for `SIGINT` and `SIGTERM`.
- `handle_sigint(int sig)`: Handles signals for graceful shutdown, sending a cancel order.

- **Client Generation (`generate_clients(int num_clients, int p, int q)`):**

- Randomly generates client coordinates within the town size `(p, q)`.

- **Server Connection (`connect_to_server(const char *ip, int port)`):**

- Creates a socket and connects to the specified server IP and port.

■ Order Handling:

- `send_order(int client_id, int p, int q)`: Sends an order to the server.
- `cancel_order(int client_id)`: Sends a cancel order to the server.

■ Client Operations (`run_clients(int p, int q)`):

- Creates a thread to handle server responses.
- Sends orders for all generated clients.

■ Server Response Handling (`handle_connection(void* arg)`):

- Continuously receives and processes messages from the server.
- Updates `is_finished` to indicate completion.

■ Work Flow



- Before Test Cases - Learn IPV4 Address INET

```

mens1s@mens1s:~/Desktop/socketProgrammingFastToFast$ ifconfig
enp6s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
      ether b4:a9:fc:6c:34:ce txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enx00e04c36ccc3: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
      ether 00:e0:4c:36:cc:c3 txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
      inet 127.0.0.1 netmask 255.0.0.0
      inet6 ::1 prefixlen 128 scopeid 0x10<host>
          loop txqueuelen 1000 (Local Loopback)
          RX packets 214946 bytes 19296115 (19.2 MB)
          RX errors 0 dropped 0 overruns 0 frame 0
          TX packets 214946 bytes 19296115 (19.2 MB)
          TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp0s20f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
      inet 192.168.1.101 netmask 255.255.255.0 broadcast 192.168.1.255
      inet6 fe80::b1bb:23f4:8ea6:d8a9 prefixlen 64 scopeid 0x20<link>
          ether 40:ec:99:1e:f5:af txqueuelen 1000 (Ethernet)
          RX packets 1155039 bytes 1313990130 (1.3 GB)
          RX errors 0 dropped 0 overruns 0 frame 0
          TX packets 341175 bytes 234253669 (234.2 MB)
          TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

mens1s@mens1s:~/Desktop/socketProgrammingFastToFast$ █
●  Server--1 COOKED 51 COOKED 24 ORDERS

```

- After getting inet address which is highlighted use this.
- Do not forget to change ip address in makefile or run the program.

- **Test Cases**

- **TEST-1**

- In same pc:
 - **./server 192.168.1.101 8091 111 23 80000**
 - **./client 192.168.1.101 8091 200 33 44**
 - **200 client - 33*44 km^2 - 111 cooks - 23 delivery personnel - 80000 meter/minute**

```

mensis@mensis:~/Desktop/socketProgrammingFastToFast$ make client --always-make
rm -f client
gcc client.c -pthread -o client -lm
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ ./server 192.168.1.101 8091 111 23 80000
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ ls
a.out client client.c logServer.txt main.c makefile server server.c
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ make server --always-make
gcc server.c -pthread -o server -lm
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ ./client 192.168.1.101 8091 200 33 44

```



```

Order id: 191 Order Time: 16:44:35 Cook Time: 16:44:36 Delivery Time: 16:47:21
Order id: 192 Order Time: 16:44:35 Cook Time: 16:44:36 Delivery Time: 16:47:29
There is no new order, so 8 delivery person goes to deliver packages.
Order id: 193 Order Time: 16:44:35 Cook Time: 16:44:36 Delivery Time: 16:47:49
Order id: 194 Order Time: 16:44:35 Cook Time: 16:44:36 Delivery Time: 16:48:25
Server shut down gracefully
***** Cook 0 cooked the most orders: 2 *****
***** Delivery person 2 delivered the most packages: 12 *****
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ cat logServer.txt
350 } Client 196 received: ORDER_DELIVERED
351 if(flg=Client 180 received: ORDER_DELIVERED
352 } b|Client 183 received: ORDER_DELIVERED
353 } Client 171 received: ORDER_DELIVERED
354 Client 177 received: ORDER_DELIVERED
355 return NULL
356 } Client 192 received: ORDER_DELIVERED
357 Client 195 received: ORDER_DELIVERED
358 > void *cook_thr|Client 199 received: ORDER_DELIVERED
414 Client 198 received: ORDER_DELIVERED
415 > void cook_over|Client 10 received: EXIT
456 Client shut down gracefully

```

- **Log Files**

```
Server--1 Cook infos
Server--1 ***** Cook 0 cooked the most orders: 2 *****
Server--1 Cook 0 cooked 2 orders
Server--1 Cook 1 cooked 2 orders
Server--1 Cook 2 cooked 2 orders
Server--1 Cook 3 cooked 2 orders
Server--1 Cook 4 cooked 2 orders
Server--1 Cook 5 cooked 2 orders
Server--1 Cook 6 cooked 2 orders
Server--1 Cook 7 cooked 2 orders
Server--1 Cook 8 cooked 2 orders
Server--1 Cook 9 cooked 2 orders
Server--1 Cook 10 cooked 2 orders
Server--1 Cook 11 cooked 2 orders
Server--1 Cook 12 cooked 2 orders
Server--1 Cook 13 cooked 2 orders
Server--1 Cook 14 cooked 2 orders
Server--1 Cook 15 cooked 2 orders
Server--1 Cook 16 cooked 2 orders
Server--1 Cook 17 cooked 2 orders
Server--1 Cook 18 cooked 2 orders
Server--1 Cook 19 cooked 2 orders
Server--1 Cook 20 cooked 2 orders
Server--1 Cook 21 cooked 2 orders
Server--1 Cook 22 cooked 2 orders
Server--1 Cook 23 cooked 2 orders
Server--1 Cook 24 cooked 2 orders
Server--1 Cook 25 cooked 2 orders
Server--1 Cook 26 cooked 2 orders
Server--1 Cook 27 cooked 2 orders
Server--1 Cook 28 cooked 2 orders
Server--1 Cook 29 cooked 2 orders
Server--1 Cook 30 cooked 2 orders
Server--1 Cook 31 cooked 2 orders
Server--1 Cook 32 cooked 2 orders
Server--1 Cook 33 cooked 2 orders
Server--1 Cook 34 cooked 2 orders
Server--1 Cook 35 cooked 2 orders
Server--1 Cook 36 cooked 2 orders
```

```
1718 Server--1 Delivery person infos
1719 Server--1 ***** Delivery person 2 delivered the most packages: 12 *****
1720 Server--1 Delivery person 0 delivered 9 packages, total distance: 125, total time: 125
1721 Server--1 Delivery person 1 delivered 9 packages, total distance: 131, total time: 131
1722 Server--1 Delivery person 2 delivered 12 packages, total distance: 156, total time: 156
1723 Server--1 Delivery person 3 delivered 12 packages, total distance: 163, total time: 163
1724 Server--1 Delivery person 4 delivered 9 packages, total distance: 166, total time: 166
1725 Server--1 Delivery person 5 delivered 12 packages, total distance: 164, total time: 164
1726 Server--1 Delivery person 6 delivered 9 packages, total distance: 142, total time: 142
1727 Server--1 Delivery person 7 delivered 9 packages, total distance: 174, total time: 174
1728 Server--1 Delivery person 8 delivered 8 packages, total distance: 172, total time: 172
1729 Server--1 Delivery person 9 delivered 6 packages, total distance: 130, total time: 130
1730 Server--1 Delivery person 10 delivered 9 packages, total distance: 141, total time: 141
1731 Server--1 Delivery person 11 delivered 9 packages, total distance: 128, total time: 128
1732 Server--1 Delivery person 12 delivered 9 packages, total distance: 124, total time: 124
1733 Server--1 Delivery person 13 delivered 9 packages, total distance: 160, total time: 160
1734 Server--1 Delivery person 14 delivered 9 packages, total distance: 148, total time: 148
1735 Server--1 Delivery person 15 delivered 6 packages, total distance: 123, total time: 123
1736 Server--1 Delivery person 16 delivered 6 packages, total distance: 143, total time: 143
1737 Server--1 Delivery person 17 delivered 9 packages, total distance: 142, total time: 142
1738 Server--1 Delivery person 18 delivered 9 packages, total distance: 163, total time: 163
1739 Server--1 Delivery person 19 delivered 9 packages, total distance: 164, total time: 164
1740 Server--1 Delivery person 20 delivered 9 packages, total distance: 122, total time: 122
1741 Server--1 Delivery person 21 delivered 6 packages, total distance: 139, total time: 139
1742 Server--1 Delivery person 22 delivered 6 packages, total distance: 117, total time: 117
```

- **test**

- TEST-2

- In same pc:
- **./server 192.168.1.101 8091 20 19 320000**
- **./client 192.168.1.101 8091 500 33 44**
- **500 client - 33*44 km^2 - 20 cooks - 19 delivery personnel - 320000 meter/minute**

The image shows two terminal windows side-by-side. The left window has the title "mens1s@mens1s: ~/Desktop/socketProgrammingFastToFast" and contains the command "mens1s@mens1s:~/Desktop/socketProgrammingFastToFast\$./server 192.168.1.101 8091 20 19 320000". The right window also has the title "mens1s@mens1s: ~/Desktop/socketProgrammingFastToFast" and contains the command "mens1s@mens1s:~/Desktop/socketProgrammingFastToFast\$./client 192.168.1.101 8091 500 33 44". Both windows show the command being typed.

- Random Time

The image shows a single terminal window with the title "mens1s@mens1s: ~/Desktop/socketProgrammingFastToFast". It displays the logs from both the server and client programs. The server log on the left shows messages like "Cook 0 is ready for delivery order 180" and "Received new order: ID=390". The client log on the right shows messages like "Client 183 received: ORDER_READY" and "Client 203 received: ORDER_PREPARING". The logs are interleaved, indicating simultaneous activity between the two programs.

```
Cook 0 is ready for delivery order 180
Received new order: ID=390
Cook 1 is ready for delivery order 181
Received new order: ID=391
Cook 2 is ready for delivery order 182
Received new order: ID=392
Cook 3 is ready for delivery order 183
Received new order: ID=393
Cook 4 is ready for delivery order 184
Received new order: ID=394
Cook 5 is ready for delivery order 185
Received new order: ID=395
Cook 6 is ready for delivery order 186
Received new order: ID=396
Cook 7 is ready for delivery order 187
Received new order: ID=397
Cook 8 is ready for delivery order 188
Received new order: ID=398
Cook 9 is ready for delivery order 189
Received new order: ID=399
Cook 10 is ready for delivery order 190
Received new order: ID=400
Cook 11 is ready for delivery order 191
Client 183 received: ORDER_READY
Client 203 received: ORDER_PREPARING
Client 393 received: ORDER_RECEIVED
Client 184 received: ORDER_READY
Client 204 received: ORDER_PREPARING
Client 394 received: ORDER_RECEIVED
Client 185 received: ORDER_READY
Client 205 received: ORDER_PREPARING
Client 395 received: ORDER_RECEIVED
Client 186 received: ORDER_READY
Client 206 received: ORDER_PREPARING
Client 396 received: ORDER_RECEIVED
Client 187 received: ORDER_READY
Client 207 received: ORDER_PREPARING
Client 397 received: ORDER_RECEIVED
Client 188 received: ORDER_READY
Client 208 received: ORDER_PREPARING
Client 398 received: ORDER_RECEIVED
Client 189 received: ORDER_READY
Client 209 received: ORDER_PREPARING
Client 399 received: ORDER_RECEIVED
Client 190 received: ORDER_READY
Client 210 received: ORDER_PREPARING
```

```

Order id: 493 Order Time: 16:53:5 Cook Time: 16:53:18 Delivery Time: 16:54:39
Order id: 468 Order Time: 16:53:5 Cook Time: 16:53:17 Delivery Time: 16:54:39
Order id: 492 Order Time: 16:53:5 Cook Time: 16:53:18 Delivery Time: 16:54:44
There is no new order, so 16 delivery person goes to deliver packages.
Order id: 499 Order Time: 16:53:5 Cook Time: 16:53:18 Delivery Time: 16:54:45
Order id: 498 Order Time: 16:53:5 Cook Time: 16:53:18 Delivery Time: 16:54:47
Server shut down gracefully
***** Cook 0 cooked the most orders: 25 *****
***** Delivery person 15 delivered the most packages: 33 *****
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ 
2050 OrderI Client 405 received: ORDER_DELIVERED
2051 OrderI Client 483 received: ORDER_DELIVERED
2052 OrderI Client 493 received: ORDER_DELIVERED
2053 OrderI Client 468 received: ORDER_DELIVERED
2054 OrderI Client 492 received: ORDER_DELIVERED
2055 OrderI Client 499 received: ORDER_DELIVERED
2056 OrderI Client 498 received: ORDER_DELIVERED
2057 OrderI Client 10 received: EXIT
2058 OrderI Client shut down gracefully
2059 OrderI Client 10 received: EXIT
2060 OrderI mensis@mensis:~/Desktop/socketProgrammingFastToFast$ 
2061 OrderI Client 312 Cook 2 is preparing order 312

```

- **Log File**

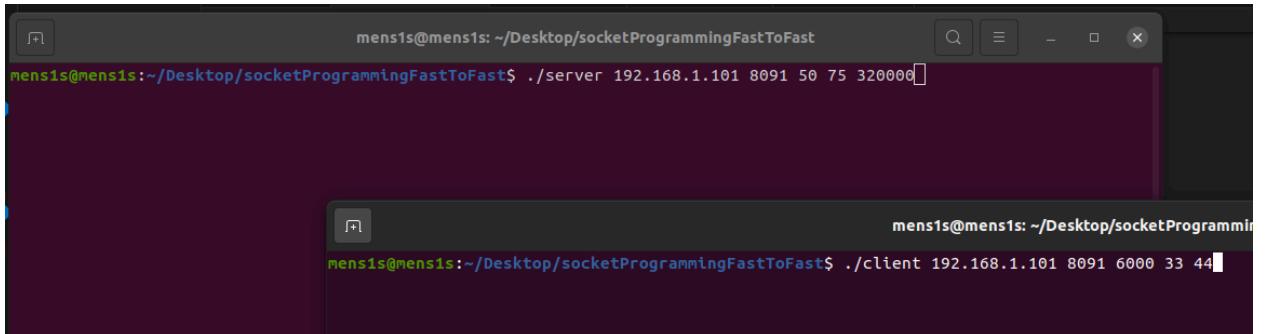
```

4005 Server--1 Cook infos
4006 Server--1 ***** Cook 0 cooked the most orders: 25 *****
4007 Server--1 Cook 0 cooked 25 orders
4008 Server--1 Cook 1 cooked 25 orders
4009 Server--1 Cook 2 cooked 25 orders
4010 Server--1 Cook 3 cooked 25 orders
4011 Server--1 Cook 4 cooked 25 orders
4012 Server--1 Cook 5 cooked 25 orders
4013 Server--1 Cook 6 cooked 25 orders
4014 Server--1 Cook 7 cooked 25 orders
4015 Server--1 Cook 8 cooked 25 orders
4016 Server--1 Cook 9 cooked 25 orders
4017 Server--1 Cook 10 cooked 25 orders
4018 Server--1 Cook 11 cooked 25 orders
4019 Server--1 Cook 12 cooked 25 orders
4020 Server--1 Cook 13 cooked 25 orders
4021 Server--1 Cook 14 cooked 25 orders
4022 Server--1 Cook 15 cooked 25 orders
4023 Server--1 Cook 16 cooked 25 orders
4024 Server--1 Cook 17 cooked 25 orders
4025 Server--1 Cook 18 cooked 25 orders
4026 Server--1 Cook 19 cooked 25 orders
4027 Server--1 Delivery person infos
4028 Server--1 ***** Delivery person 15 delivered the most packages: 33 *****
4029 Server--1 Delivery person 0 delivered 27 packages, total distance: 474, total time: 82
4030 Server--1 Delivery person 1 delivered 30 packages, total distance: 486, total time: 84
4031 Server--1 Delivery person 2 delivered 24 packages, total distance: 486, total time: 87
4032 Server--1 Delivery person 3 delivered 24 packages, total distance: 514, total time: 92
4033 Server--1 Delivery person 4 delivered 27 packages, total distance: 487, total time: 88
4034 Server--1 Delivery person 5 delivered 27 packages, total distance: 483, total time: 84
4035 Server--1 Delivery person 6 delivered 24 packages, total distance: 476, total time: 86
4036 Server--1 Delivery person 7 delivered 24 packages, total distance: 506, total time: 90
4037 Server--1 Delivery person 8 delivered 27 packages, total distance: 510, total time: 91
4038 Server--1 Delivery person 9 delivered 30 packages, total distance: 471, total time: 80
4039 Server--1 Delivery person 10 delivered 27 packages, total distance: 486, total time: 89
4040 Server--1 Delivery person 11 delivered 27 packages, total distance: 463, total time: 80
4041 Server--1 Delivery person 12 delivered 27 packages, total distance: 488, total time: 86
4042 Server--1 Delivery person 13 delivered 27 packages, total distance: 531, total time: 93
4043 Server--1 Delivery person 14 delivered 24 packages, total distance: 464, total time: 85
4044 Server--1 Delivery person 15 delivered 33 packages, total distance: 487, total time: 85
4045 Server--1 Delivery person 16 delivered 26 packages, total distance: 470, total time: 83
4046 Server--1 Delivery person 17 delivered 21 packages, total distance: 474, total time: 88
4047 Server--1 Delivery person 18 delivered 24 packages, total distance: 471, total time: 83
4048

```

• TEST-3

- In same pc: BIG-NUMBER
 - `./server 192.168.1.101 8091 50 75 320000`
 - `./client 192.168.1.101 8091 6000 33 44`
 - **6000 client - 33*44 km² - 50 cooks - 75 delivery personnel - 320000 meter/minute**



• [Home](#)

```
Cook 11 is ready for delivery order 411
Received new order: ID=450
Cook 12 is ready for delivery order 412
Received new order: ID=451
Order id: 175 Order Time: 16:57:16 Cook Time: 16:57:17 Delivery Time: 16:57:23
Cook 13 is ready for delivery order 413
Received new order: ID=452
Cook 14 is ready for delivery order 414
Received new order: ID=453
Cook 15 is ready for delivery order 415
Received new order: ID=454
Order id: 236 Order Time: 16:57:18 Cook Time: 16:57:19 Delivery Time: 16:57:24
Cook 16 is ready for delivery order 416
Received new order: ID=455
Cook 17 is ready for delivery order 417
Received new order: ID=456
Order id: 60 Order Time: 16:57:19 Cook Time: 16:57:20 Delivery Time: 16:57:25
Cook 18 is ready for delivery order 418
Received new order: ID=457
Order id: 166 Order Time: 16:57:20 Cook Time: 16:57:21 Delivery Time: 16:57:26
Cook 19 is ready for delivery order 419
Received new order: ID=458
Client 413 received: ORDER_READY
Client 452 received: ORDER RECEIVED
Client 452 received: ORDER PREPARING
Client 414 received: ORDER READY
Client 453 received: ORDER RECEIVED
Client 453 received: ORDER PREPARING
Client 415 received: ORDER READY
Client 454 received: ORDER RECEIVED
Client 454 received: ORDER PREPARING
Client 236 received: ORDER DELIVERED
Client 416 received: ORDER READY
Client 455 received: ORDER RECEIVED
Client 455 received: ORDER PREPARING
Client 417 received: ORDER READY
Client 456 received: ORDER RECEIVED
Client 456 received: ORDER PREPARING
Client 60 received: ORDER DELIVERED
Client 418 received: ORDER READY
Client 457 received: ORDER RECEIVED
Client 457 received: ORDER PREPARING
Client 166 received: ORDER DELIVERED
Client 419 received: ORDER READY
Client 210 received: ORDER DELIVERED
```

- **Final**

```

Order id: 5964 Order Time: 16:59:45 Cook Time: 16:59:46 Delivery Time: 17:2:16
Order id: 5898 Order Time: 16:59:43 Cook Time: 16:59:44 Delivery Time: 17:2:17
Order id: 5991 Order Time: 16:59:46 Cook Time: 16:59:47 Delivery Time: 17:2:17
Order id: 5988 Order Time: 16:59:46 Cook Time: 16:59:47 Delivery Time: 17:2:18
Order id: 5919 Order Time: 16:59:44 Cook Time: 16:59:45 Delivery Time: 17:2:18
Order id: 5949 Order Time: 16:59:45 Cook Time: 16:59:46 Delivery Time: 17:2:18
Order id: 5973 Order Time: 16:59:45 Cook Time: 16:59:46 Delivery Time: 17:2:18
Order id: 5928 Order Time: 16:59:44 Cook Time: 16:59:45 Delivery Time: 17:2:18
Order id: 5910 Order Time: 16:59:44 Cook Time: 16:59:45 Delivery Time: 17:2:19
Order id: 5979 Order Time: 16:59:45 Cook Time: 16:59:46 Delivery Time: 17:2:20
Server shut down gracefully
***** Cook 0 cooked the most orders: 120 *****
***** Delivery person 58 delivered the most packages: 90 *****
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ █
    4027 Serve Client 5988 received: ORDER_DELIVERED
    4028 Order Client 5919 received: ORDER_DELIVERED
    4029 Order Client 5949 received: ORDER_DELIVERED
    4030 Order Client 5973 received: ORDER_DELIVERED
    4031 Order Client 5928 received: ORDER_DELIVERED
    4032 Serve Client 5910 received: ORDER_DELIVERED
    4033 Order Client 5979 received: ORDER_DELIVERED
    4034 Order Client 10 received: EXIT
    4035 Order Client shut down gracefully
    4036 Order Client 5910 received: ORDER_DELIVERED
    4037 Serve mensis@mensis:~/Desktop/socketProgrammingFastToFast$ █
  
```

- **Log File First 50 Cook and Delivery Personnel**

```

48004 Server--1 Cook infos
48005 Server--1 ***** Cook 0 cooked the most orders: 120 *****
48006 Server--1 Cook 0 cooked 120 orders
48007 Server--1 Cook 1 cooked 120 orders
48008 Server--1 Cook 2 cooked 120 orders
48009 Server--1 Cook 3 cooked 120 orders
48010 Server--1 Cook 4 cooked 120 orders
48011 Server--1 Cook 5 cooked 120 orders
48012 Server--1 Cook 6 cooked 120 orders
48013 Server--1 Cook 7 cooked 120 orders
48014 Server--1 Cook 8 cooked 120 orders
48015 Server--1 Cook 9 cooked 120 orders
48016 Server--1 Cook 10 cooked 120 orders
48017 Server--1 Cook 11 cooked 120 orders
48018 Server--1 Cook 12 cooked 120 orders
48019 Server--1 Cook 13 cooked 120 orders
48020 Server--1 Cook 14 cooked 120 orders
48021 Server--1 Cook 15 cooked 120 orders
48022 Server--1 Cook 16 cooked 120 orders
48023 Server--1 Cook 17 cooked 120 orders
48024 Server--1 Cook 18 cooked 120 orders
48025 Server--1 Cook 19 cooked 120 orders
48026 Server--1 Cook 20 cooked 120 orders
48027 Server--1 Cook 21 cooked 120 orders
48028 Server--1 Cook 22 cooked 120 orders
48029 Server--1 Cook 23 cooked 120 orders
48030 Server--1 Cook 24 cooked 120 orders
48031 Server--1 Cook 25 cooked 120 orders
48032 Server--1 Cook 26 cooked 120 orders
48033 Server--1 Cook 27 cooked 120 orders
48034 Server--1 Cook 28 cooked 120 orders
48035 Server--1 Cook 29 cooked 120 orders
48036 Server--1 Cook 30 cooked 120 orders
48037 Server--1 Cook 31 cooked 120 orders
48038 Server--1 Cook 32 cooked 120 orders
48039 Server--1 Cook 33 cooked 120 orders
48040 Server--1 Cook 34 cooked 120 orders
48041 Server--1 Cook 35 cooked 120 orders
48042 Server--1 Cook 36 cooked 120 orders
48043 Server--1 Cook 37 cooked 120 orders
48044 Server--1 Cook 38 cooked 120 orders
48045 Server--1 Cook 39 cooked 120 orders
48046 Server--1 Cook 40 cooked 120 orders
48047 Server--1 Cook 41 cooked 120 orders
48048 Server--1 Cook 42 cooked 120 orders
48049 Server--1 Cook 43 cooked 120 orders
48050 Server--1 Cook 44 cooked 120 orders
48051 Server--1 Cook 45 cooked 120 orders
48052 Server--1 Cook 46 cooked 120 orders
48053 Server--1 Cook 47 cooked 120 orders
48054 Server--1 Cook 48 cooked 120 orders
48055 Server--1 Cook 49 cooked 120 orders
48056 Server--1 Delivery person infos
48057 Server--1 ***** Delivery person 58 delivered the most packages: 90 *****
  
```

```
48056 Server--1 Delivery person infos
48057 Server--1 ***** Delivery person 58 delivered the most packages: 90 *****
48058 Server--1 Delivery person 0 delivered 87 packages, total distance: 1424, total time: 253
48059 Server--1 Delivery person 1 delivered 87 packages, total distance: 1438, total time: 251
48060 Server--1 Delivery person 2 delivered 84 packages, total distance: 1428, total time: 258
48061 Server--1 Delivery person 3 delivered 78 packages, total distance: 1438, total time: 255
48062 Server--1 Delivery person 4 delivered 81 packages, total distance: 1425, total time: 251
48063 Server--1 Delivery person 5 delivered 78 packages, total distance: 1431, total time: 260
48064 Server--1 Delivery person 6 delivered 78 packages, total distance: 1455, total time: 261
48065 Server--1 Delivery person 7 delivered 78 packages, total distance: 1434, total time: 260
48066 Server--1 Delivery person 8 delivered 75 packages, total distance: 1426, total time: 255
48067 Server--1 Delivery person 9 delivered 81 packages, total distance: 1456, total time: 257
48068 Server--1 Delivery person 10 delivered 78 packages, total distance: 1428, total time: 257
48069 Server--1 Delivery person 11 delivered 81 packages, total distance: 1435, total time: 255
48070 Server--1 Delivery person 12 delivered 78 packages, total distance: 1439, total time: 260
48071 Server--1 Delivery person 13 delivered 81 packages, total distance: 1463, total time: 257
48072 Server--1 Delivery person 14 delivered 81 packages, total distance: 1489, total time: 262
48073 Server--1 Delivery person 15 delivered 87 packages, total distance: 1474, total time: 259
48074 Server--1 Delivery person 16 delivered 81 packages, total distance: 1474, total time: 260
48075 Server--1 Delivery person 17 delivered 78 packages, total distance: 1438, total time: 259
48076 Server--1 Delivery person 18 delivered 84 packages, total distance: 1476, total time: 263
48077 Server--1 Delivery person 19 delivered 87 packages, total distance: 1425, total time: 248
48078 Server--1 Delivery person 20 delivered 75 packages, total distance: 1483, total time: 268
48079 Server--1 Delivery person 21 delivered 75 packages, total distance: 1425, total time: 257
48080 Server--1 Delivery person 22 delivered 78 packages, total distance: 1441, total time: 258
48081 Server--1 Delivery person 23 delivered 75 packages, total distance: 1445, total time: 262
48082 Server--1 Delivery person 24 delivered 84 packages, total distance: 1417, total time: 246
48083 Server--1 Delivery person 25 delivered 69 packages, total distance: 1427, total time: 262
48084 Server--1 Delivery person 26 delivered 84 packages, total distance: 1417, total time: 250
48085 Server--1 Delivery person 27 delivered 75 packages, total distance: 1426, total time: 255
48086 Server--1 Delivery person 28 delivered 69 packages, total distance: 1439, total time: 257
48087 Server--1 Delivery person 29 delivered 87 packages, total distance: 1429, total time: 251
48088 Server--1 Delivery person 30 delivered 78 packages, total distance: 1407, total time: 251
48089 Server--1 Delivery person 31 delivered 84 packages, total distance: 1444, total time: 253
48090 Server--1 Delivery person 32 delivered 78 packages, total distance: 1473, total time: 265
48091 Server--1 Delivery person 33 delivered 75 packages, total distance: 1448, total time: 262
48092 Server--1 Delivery person 34 delivered 72 packages, total distance: 1428, total time: 254
48093 Server--1 Delivery person 35 delivered 81 packages, total distance: 1413, total time: 250
48094 Server--1 Delivery person 36 delivered 75 packages, total distance: 1435, total time: 255
48095 Server--1 Delivery person 37 delivered 87 packages, total distance: 1404, total time: 247
48096 Server--1 Delivery person 38 delivered 81 packages, total distance: 1454, total time: 259
48097 Server--1 Delivery person 39 delivered 81 packages, total distance: 1469, total time: 255
48098 Server--1 Delivery person 40 delivered 87 packages, total distance: 1402, total time: 245
48099 Server--1 Delivery person 41 delivered 72 packages, total distance: 1438, total time: 257
48100 Server--1 Delivery person 42 delivered 81 packages, total distance: 1418, total time: 254
48101 Server--1 Delivery person 43 delivered 81 packages, total distance: 1435, total time: 256
48102 Server--1 Delivery person 44 delivered 78 packages, total distance: 1453, total time: 261
48103 Server--1 Delivery person 45 delivered 78 packages, total distance: 1429, total time: 254
48104 Server--1 Delivery person 46 delivered 81 packages, total distance: 1432, total time: 253
48105 Server--1 Delivery person 47 delivered 81 packages, total distance: 1421, total time: 255
48106 Server--1 Delivery person 48 delivered 84 packages, total distance: 1464, total time: 261
48107 Server--1 Delivery person 49 delivered 81 packages, total distance: 1435, total time: 258
48108 Server--1 Delivery person 50 delivered 75 packages, total distance: 1427, total time: 253
```

- TEST-4

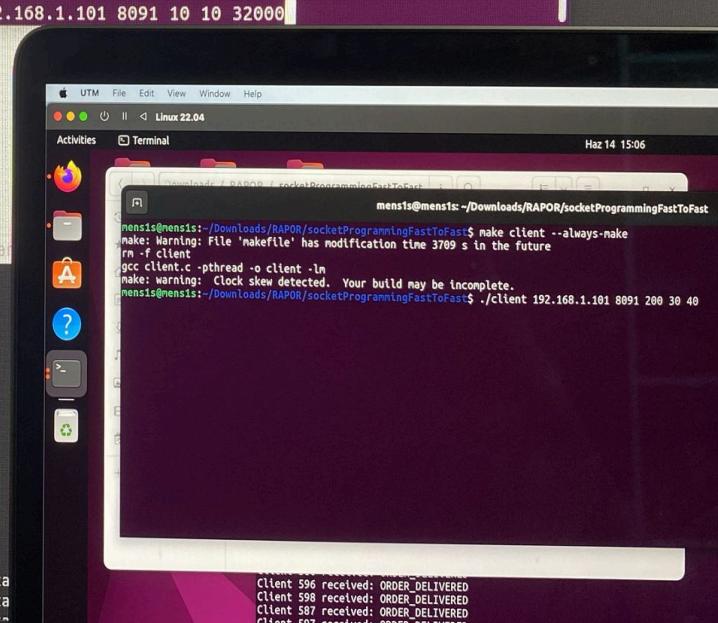
- DIFFERENT pc:
- **./server 192.168.1.101 8091 10 10 32000**
- **./client 192.168.1.101 8091 200 30 40**
- **200 client - 33*44 km^2 - 10 cooks - 10 delivery personnel - 32000 meter/minute**

```
Order id: 5982 Order Time: 16:59:46 Cook Time: 16:59:47 Delivery Time: 17:2:16
Order id: 5970 Order Time: 16:59:45 Cook Time: 16:59:46 Delivery Time: 17:2:16
Order id: 5964 Order Time: 16:59:45 Cook Time: 16:59:46 Delivery Time: 17:2:16
Order id: 5988 Order Time: 16:59:43 Cook Time: 16:59:44 Delivery Time: 17:2:17
Order id: 5991 Order Time: 16:59:46 Cook Time: 16:59:47 Delivery Time: 17:2:17
Order id: 5988 Order Time: 16:59:46 Cook Time: 16:59:47 Delivery Time: 17:2:18
Order id: 5919 Order Time: 16:59:44 Cook Time: 16:59:45 Delivery Time: 17:2:18
Order id: 5949 Order Time: 16:59:45 Cook Time: 16:59:46 Delivery Time: 17:2:18
Order id: 5973 Order Time: 16:59:45 Cook Time: 16:59:46 Delivery Time: 17:2:18
Order id: 5928 Order Time: 16:59:44 Cook Time: 16:59:45 Delivery Time: 17:2:18
Order id: 5910 Order Time: 16:59:44 Cook Time: 16:59:45 Delivery Time: 17:2:19
Order id: 5979 Order Time: 16:59:45 Cook Time: 16:59:46 Delivery Time: 17:2:20
Server shut down gracefully
***** Cook 0 cooked the most orders: 120 *****
***** Delivery person 58 delivered the most packages: 90 *****
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ ./server 192.168.1.101 8091 10 10 32000
```

Locations

RAPOR.txt

```
48043 Server--1 Cook 37 cooked 120 orders
48044 Server--1 Cook 38 cooked 120 orders
48045 Server--1 Cook 39 cooked 120 orders
48046 Server--1 Cook 40 cooked 120 orders
48047 Server--1 Cook 41 cooked 120 orders
48048 Server--1 Cook 42 cooked 120 orders
48049 Server--1 Cook 43 cooked 120 orders
48050 Server--1 Cook 44 cooked 120 orders
48051 Server--1 Cook 45 cooked 120 orders
48052 Server--1 Cook 46 cooked 120 orders
48053 Server--1 Cook 47 cooked 120 orders
48054 Server--1 Cook 48 cooked 120 orders
48055 Server--1 Cook 49 cooked 120 orders
48056 Server--1 Delivery person infos
48057 Server--1 ***** Delivery person 58 delivered the most packages: 90 *****
48058 Server--1 Delivery person 0 delivered 87 packages, total distance: 1424, tota
48059 Server--1 Delivery person 1 delivered 87 packages, total distance: 1438, tota
0 Client 596 received: ORDER_DELIVERED
Client 598 received: ORDER_DELIVERED
Client 587 received: ORDER_DELIVERED
Client 597 received: ORDER_DELIVERED
```



```

1 Order id: 65 Order Time: 17:10:45 Cook Time: 17:10:50 Delivery Time: 17:10:51
2 Cook 6 is ready for delivery order 66
3 Cook 7 is ready for delivery order 67
4 Cook 8 is ready for delivery order 68
5 Order id: 68 Order Time: 17:10:45 Cook Time: 17:10:51 Delivery Time: 17:10:51
6 Order id: 67 Order Time: 17:10:45 Cook Time: 17:10:51 Delivery Time: 17:10:51
7 Order id: 66 Order Time: 17:10:45 Cook Time: 17:10:51 Delivery Time: 17:10:51
8 Cook 9 is ready for delivery order 69
9 Cook 0 is ready for delivery order 70
10 Cook 2 is ready for delivery order 71
11 Order id: 71 Order Time: 17:10:45 Cook Time: 17:10:51 Delivery Time: 17:10:51
12 Order id: 70 Order Time: 17:10:45 Cook Time: 17:10:51 Delivery Time: 17:10:51
13 Order id: 69 Order Time: 17:10:45 Cook Time: 17:10:51 Delivery Time: 17:10:51
14 Cook 1 is ready for delivery order 72
15 Cook 3 is ready for delivery order 73
16 Cook 4 is ready for delivery order 74
17 Order id: 74 Order Time: 17:10:46 Cook Time: 17:10:51 Delivery Time: 17:10:51
18 Order id: 73 Order Time: 17:10:46 Cook Time: 17:10:51 Delivery Time: 17:10:51
19 Order id: 72 Order Time: 17:10:45 Cook Time: 17:10:51 Delivery Time: 17:10:51

Server--1 Received new order: ID=19, Position=(15.59, 38.95)
Server--1 Received new order: ID=20, Position=(19.31, 21.22)
Server--1 Received new order: ID=21, Position=(28.91, 28.23)
Server--1 Received new order: ID=22, Position=(8.94, 23.85)
Server--1 Received new order: ID=23, Position=(5.85, 8.31)
Server--1 Received new order: ID=24, Position=(25.69, 11.85)
Server--1 Received new order: ID=25, Position=(27.64, 21.12)
Server--1 Received new order: ID=26, Position=(14.48, 20.78)
Server--1 Received new order: ID=27, Position=(11.88, 28.65)
Server--1 Received new order: ID=28, Position=(8.73, 15.73)
Server--1 Received new order: ID=29, Position=(28.68, 7.57)
Server--1 Received new order: ID=30, Position=(14.23, 34.99)
Server--1 Received new order: ID=31, Position=(9.93, 0.47)
Server--1 Received new order: ID=32, Position=(13.47, 18.63)
Server--1 Received new order: ID=33, Position=(14.12, 37.44)
Server--1 Received new order: ID=34, Position=(19.06, 39.61)
OrderId-0 ORDER_COOKING 0
OrderId-0 Cook 0 is getting 0. the order from oven
OrderId-0 ORDER_READY 0
OrderId-10 Cook 0 is preparing order 10
Server--1 Manager assigned order: 0 to 0 delivery person
Server--1 Received new order: ID=35, Position=(27.30, 11.17)
OrderId-1 ORDER_COOKING 1
OrderId-1 Cook 2 is getting 1. the order from oven
OrderId-1 ORDER_READY 1
OrderId-11 Cook 2 is preparing order 11
Server--1 Manager assigned order: 1 to 0 delivery person
Server--1 Received new order: ID=36, Position=(15.63, 34.94)
OrderId-2 ORDER_COOKING 2

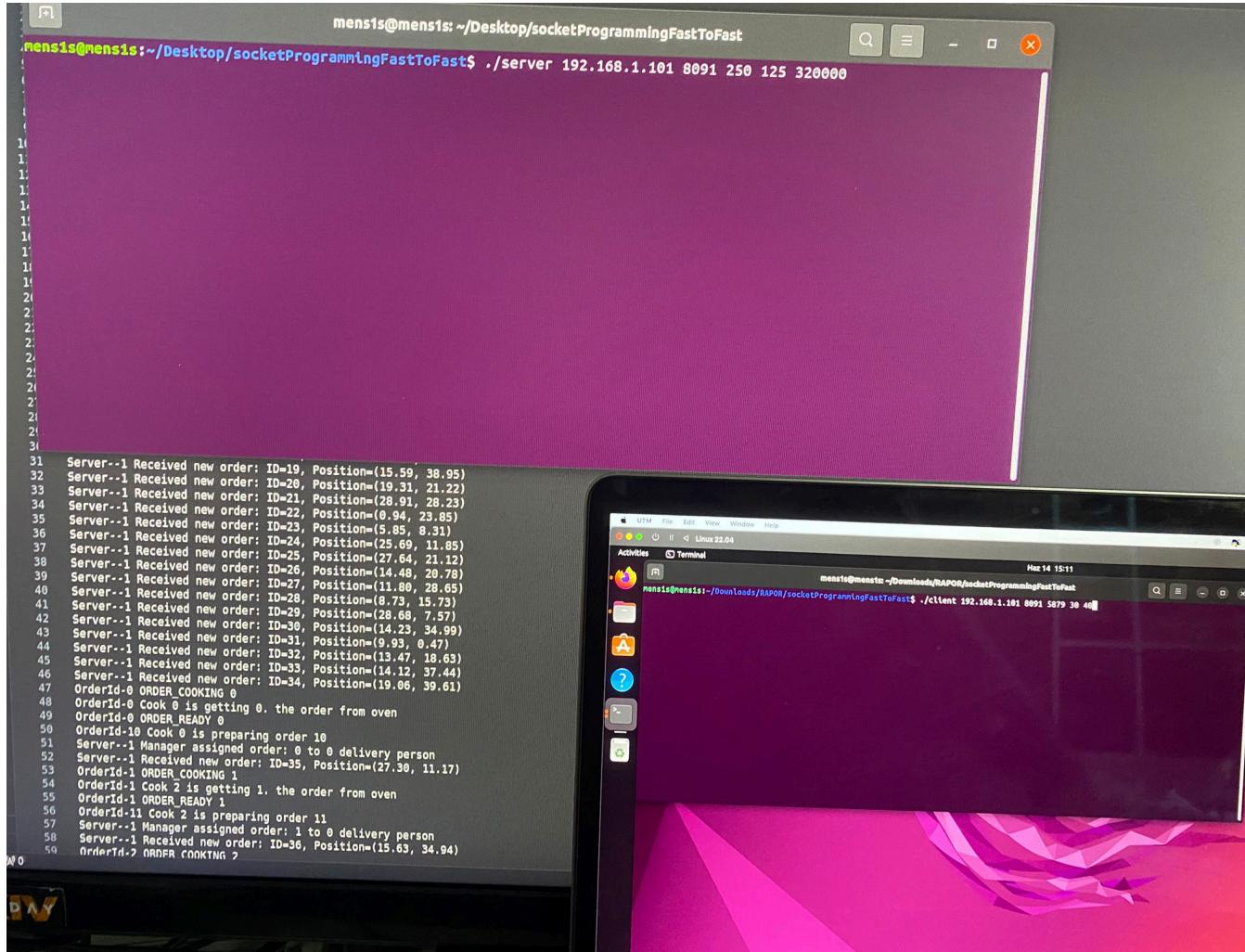
1 Order id: 194 Order Time: 17:10:49 Cook Time: 17:11:3 Delivery Time: 17:11:3
2 Order id: 193 Order Time: 17:10:49 Cook Time: 17:11:3 Delivery Time: 17:11:3
3 Order id: 192 Order Time: 17:10:49 Cook Time: 17:11:3 Delivery Time: 17:11:3
4 Cook 5 is ready for delivery order 195
5 Cook 6 is ready for delivery order 196
6 Cook 7 is ready for delivery order 197
7 Order id: 197 Order Time: 17:10:49 Cook Time: 17:11:4 Delivery Time: 17:11:4
8 Order id: 196 Order Time: 17:10:49 Cook Time: 17:11:4 Delivery Time: 17:11:4
9 Order id: 195 Order Time: 17:10:49 Cook Time: 17:11:4 Delivery Time: 17:11:4
10 Cook 8 is ready for delivery order 198
11 There is no new order, so 0 delivery person goes to deliver packages.
12 Order id: 198 Order Time: 17:10:49 Cook Time: 17:11:4 Delivery Time: 17:11:4
13 Cook 9 is ready for delivery order 199
14 There is no new order, so 0 delivery person goes to deliver packages.
15 Order id: 199 Order Time: 17:10:49 Cook Time: 17:11:4 Delivery Time: 17:11:4
16 Server shut down gracefully
17 ***** Cook 0 cooked the most orders: 20 *****
18 ***** Delivery person 0 delivered the most packages: 200 *****
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ 

31 Server--1 Received new order: ID=19, Position=(15.59, 38.95)
32 Server--1 Received new order: ID=20, Position=(19.31, 21.22)
33 Server--1 Received new order: ID=21, Position=(28.91, 28.23)
34 Server--1 Received new order: ID=22, Position=(8.94, 23.85)
35 Server--1 Received new order: ID=23, Position=(5.85, 8.31)
36 Server--1 Received new order: ID=24, Position=(25.69, 11.85)
37 Server--1 Received new order: ID=25, Position=(27.64, 21.12)
38 Server--1 Received new order: ID=26, Position=(14.48, 20.78)
39 Server--1 Received new order: ID=27, Position=(11.88, 28.65)
40 Server--1 Received new order: ID=28, Position=(8.73, 15.73)
41 Server--1 Received new order: ID=29, Position=(28.68, 7.57)
42 Server--1 Received new order: ID=30, Position=(14.23, 34.99)
43 Server--1 Received new order: ID=31, Position=(9.93, 0.47)
44 Server--1 Received new order: ID=32, Position=(13.47, 18.63)
45 Server--1 Received new order: ID=33, Position=(14.12, 37.44)
46 Server--1 Received new order: ID=34, Position=(19.06, 39.61)
47 OrderId-0 ORDER_COOKING 0
48 OrderId-0 Cook 0 is getting 0. the order from oven
49 OrderId-0 ORDER_READY 0
50 OrderId-10 Cook 0 is preparing order 10
51 Server--1 Manager assigned order: 0 to 0 delivery person
52 Server--1 Received new order: ID=35, Position=(27.30, 11.17)
53 OrderId-1 ORDER_COOKING 1
54 OrderId-1 Cook 2 is getting 1. the order from oven
55 OrderId-1 ORDER_READY 1
56 OrderId-11 Cook 2 is preparing order 11
57 Server--1 Manager assigned order: 1 to 0 delivery person
58 Server--1 Received new order: ID=36, Position=(15.63, 34.94)
59 OrderId-2 ORDER_COOKING 2

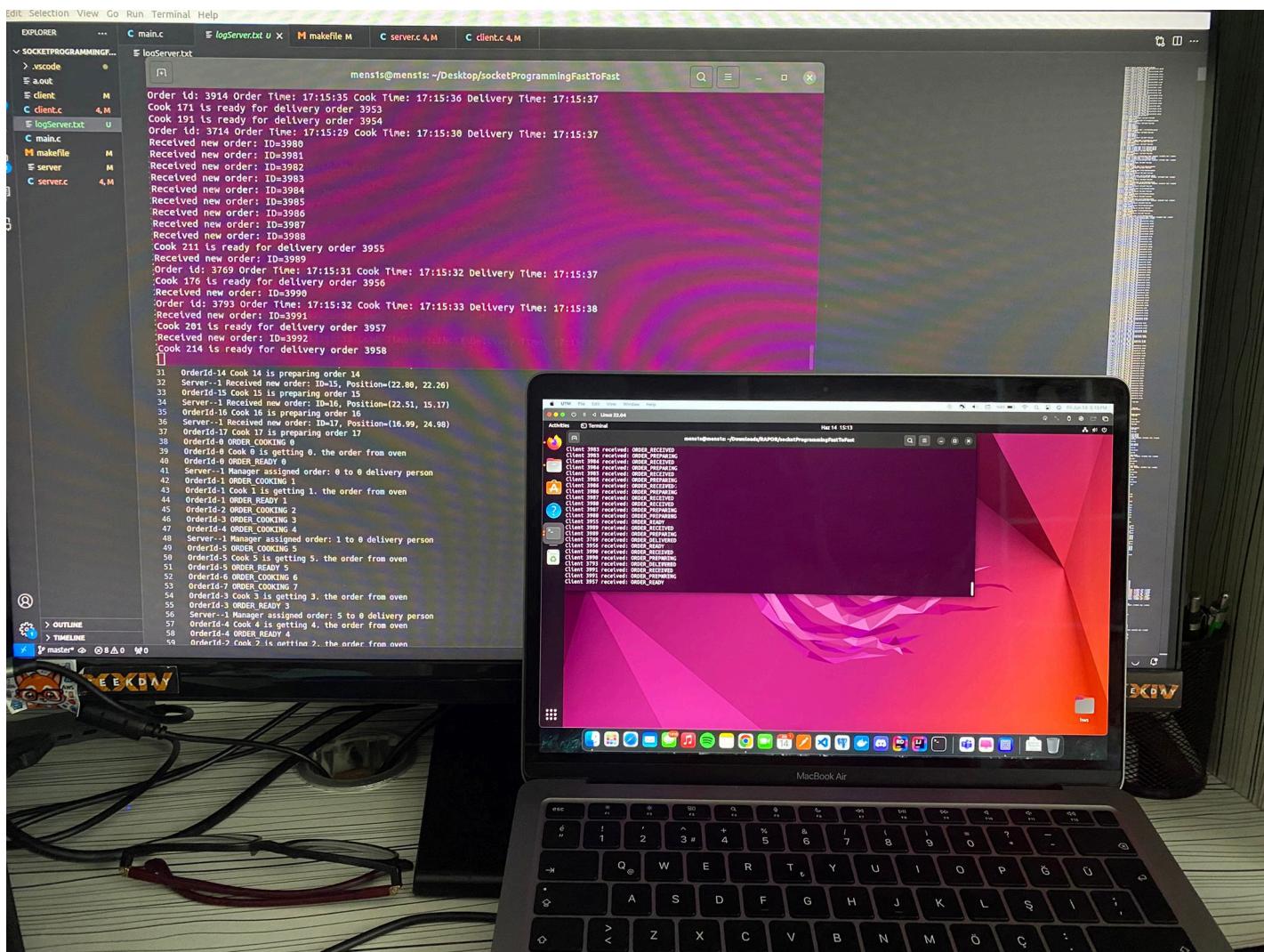
```

• TEST-5

- DIFFERENT pc: BIG-NUMBER
 - ./server 192.168.1.101 8091 250 125 320000
 - ./client 192.168.1.101 8091 5879 30 40
 - 5879 client - $33 \times 44 \text{ km}^2$ - 63 cooks - 125 delivery personnel - 320000 meter/minute



● Random Time



- Final Foto

```
Order id: 5859 Order Time: 17:16:33 Cook Time: 17:16:34 Delivery Time: 17:16:48
Order id: 5823 Order Time: 17:16:32 Cook Time: 17:16:33 Delivery Time: 17:16:48
Order id: 5730 Order Time: 17:16:30 Cook Time: 17:16:31 Delivery Time: 17:16:48
Order id: 5757 Order Time: 17:16:30 Cook Time: 17:16:31 Delivery Time: 17:16:49
Order id: 5847 Order Time: 17:16:33 Cook Time: 17:16:34 Delivery Time: 17:16:50
Order id: 5841 Order Time: 17:16:33 Cook Time: 17:16:34 Delivery Time: 17:16:50
Order id: 5874 Order Time: 17:16:34 Cook Time: 17:16:35 Delivery Time: 17:16:54
There is no new order, so 35 delivery person goes to deliver packages.
Order id: 5878 Order Time: 17:16:34 Cook Time: 17:16:35 Delivery Time: 17:16:55
Order id: 5877 Order Time: 17:16:34 Cook Time: 17:16:35 Delivery Time: 17:16:56
Server shut down gracefully
***** Cook 70 cooked the most orders: 26 *****
***** Delivery person 61 delivered the most packages: 63 *****
mensis@mensis:~/Desktop/socketProgrammingFastToFast$ 
```

31 orderId-14 Cook 14 is preparing order 14
32 Server--1 Received new order: ID=19, Position=(22.80, 22.26)
33 orderId-15 Cook 15 is preparing order 15
34 Server--1 Received new order: ID=16, Position=(22.51, 15.17)
35 orderId-16 Cook 16 is preparing order 16
36 Server--1 Received new order: ID=17, Position=(16.99, 24.98)
37 orderId-17 Cook 17 is preparing order 17
38 orderId-0 ORDER COOKING 0
39 orderId-0 Cook 0 is getting 0. the order from oven
40 orderId-0 ORDER READY 0
41 Server--1 Manager assigned order: 0 to 0 delivery person
42 orderId-1 ORDER COOKING 1
43 orderId-1 Cook 1 is getting 1. the order from oven
44 orderId-1 ORDER READY 1
45 orderId-2 ORDER COOKING 2
46 orderId-3 ORDER COOKING 3
47 orderId-4 ORDER COOKING 4
48 Server--1 Manager assigned order: 1 to 0 delivery person
49 orderId-5 ORDER COOKING 5
50 orderId-5 Cook 5 is getting 5. the order from oven
51 orderId-5 ORDER READY 5
52 orderId-6 ORDER COOKING 6
53 orderId-7 ORDER COOKING 7
54 orderId-3 Cook 3 is getting 3. the order from oven
55 orderId-3 ORDER READY 3
56 Server--1 Manager assigned order: 5 to 0 delivery person
57 orderId-4 Cook 4 is getting 4. the order from oven
58 orderId-4 ORDER READY 4



- Cooker Log File

```
47037 Server--1 Cook infos
47038 Server--1 ***** Cook 70 cooked the most orders: 26 *****
47039 Server--1 Cook 0 cooked 25 orders
47040 Server--1 Cook 1 cooked 24 orders
47041 Server--1 Cook 2 cooked 24 orders
47042 Server--1 Cook 3 cooked 24 orders
47043 Server--1 Cook 4 cooked 24 orders
47044 Server--1 Cook 5 cooked 24 orders
47045 Server--1 Cook 6 cooked 24 orders
47046 Server--1 Cook 7 cooked 23 orders
47047 Server--1 Cook 8 cooked 24 orders
47048 Server--1 Cook 9 cooked 25 orders
47049 Server--1 Cook 10 cooked 24 orders
47050 Server--1 Cook 11 cooked 24 orders
47051 Server--1 Cook 12 cooked 25 orders
47052 Server--1 Cook 13 cooked 24 orders
47053 Server--1 Cook 14 cooked 24 orders
47054 Server--1 Cook 15 cooked 24 orders
47055 Server--1 Cook 16 cooked 24 orders
47056 Server--1 Cook 17 cooked 24 orders
47057 Server--1 Cook 18 cooked 24 orders
47058 Server--1 Cook 19 cooked 24 orders
47059 Server--1 Cook 20 cooked 24 orders
47060 Server--1 Cook 21 cooked 24 orders
47061 Server--1 Cook 22 cooked 24 orders
47062 Server--1 Cook 23 cooked 24 orders
47063 Server--1 Cook 24 cooked 24 orders
47064 Server--1 Cook 25 cooked 24 orders
47065 Server--1 Cook 26 cooked 24 orders
47066 Server--1 Cook 27 cooked 24 orders
47067 Server--1 Cook 28 cooked 24 orders
47068 Server--1 Cook 29 cooked 23 orders
47069 Server--1 Cook 30 cooked 24 orders
```

- **Delivery Person Log File**

```
47290 Server--1 ***** Delivery person 61 delivered the most packages: 63 *****
47291 Server--1 Delivery person 0 delivered 48 packages, total distance: 855, total time: 151
47292 Server--1 Delivery person 1 delivered 54 packages, total distance: 873, total time: 152
47293 Server--1 Delivery person 2 delivered 45 packages, total distance: 872, total time: 155
47294 Server--1 Delivery person 3 delivered 51 packages, total distance: 871, total time: 155
47295 Server--1 Delivery person 4 delivered 48 packages, total distance: 841, total time: 148
47296 Server--1 Delivery person 5 delivered 51 packages, total distance: 883, total time: 156
47297 Server--1 Delivery person 6 delivered 51 packages, total distance: 884, total time: 156
47298 Server--1 Delivery person 7 delivered 57 packages, total distance: 855, total time: 146
47299 Server--1 Delivery person 8 delivered 57 packages, total distance: 866, total time: 150
47300 Server--1 Delivery person 9 delivered 51 packages, total distance: 891, total time: 156
47301 Server--1 Delivery person 10 delivered 48 packages, total distance: 878, total time: 159
47302 Server--1 Delivery person 11 delivered 57 packages, total distance: 849, total time: 148
47303 Server--1 Delivery person 12 delivered 51 packages, total distance: 859, total time: 153
47304 Server--1 Delivery person 13 delivered 51 packages, total distance: 840, total time: 147
47305 Server--1 Delivery person 14 delivered 51 packages, total distance: 828, total time: 146
47306 Server--1 Delivery person 15 delivered 48 packages, total distance: 858, total time: 153
47307 Server--1 Delivery person 16 delivered 51 packages, total distance: 838, total time: 148
47308 Server--1 Delivery person 17 delivered 51 packages, total distance: 916, total time: 161
47309 Server--1 Delivery person 18 delivered 54 packages, total distance: 814, total time: 143
47310 Server--1 Delivery person 19 delivered 48 packages, total distance: 846, total time: 150
47311 Server--1 Delivery person 20 delivered 54 packages, total distance: 854, total time: 147
47312 Server--1 Delivery person 21 delivered 54 packages, total distance: 845, total time: 149
47313 Server--1 Delivery person 22 delivered 57 packages, total distance: 836, total time: 148
47314 Server--1 Delivery person 23 delivered 54 packages, total distance: 848, total time: 149
47315 Server--1 Delivery person 24 delivered 51 packages, total distance: 834, total time: 149
47316 Server--1 Delivery person 25 delivered 48 packages, total distance: 879, total time: 155
47317 Server--1 Delivery person 26 delivered 54 packages, total distance: 884, total time: 156
47318 Server--1 Delivery person 27 delivered 51 packages, total distance: 832, total time: 145
47319 Server--1 Delivery person 28 delivered 54 packages, total distance: 856, total time: 147
47320 Server--1 Delivery person 29 delivered 57 packages, total distance: 828, total time: 145
47321 Server--1 Delivery person 30 delivered 51 packages, total distance: 851, total time: 148
47322 Server--1 Delivery person 31 delivered 51 packages, total distance: 818, total time: 141
47323 Server--1 Delivery person 32 delivered 42 packages, total distance: 821, total time: 145
47324 Server--1 Delivery person 33 delivered 57 packages, total distance: 870, total time: 153
47325 Server--1 Delivery person 34 delivered 54 packages, total distance: 856, total time: 150
47326 Server--1 Delivery person 35 delivered 56 packages, total distance: 819, total time: 143
47327 Server--1 Delivery person 36 delivered 45 packages, total distance: 830, total time: 148
47328 Server--1 Delivery person 37 delivered 48 packages, total distance: 852, total time: 149
47329 Server--1 Delivery person 38 delivered 51 packages, total distance: 812, total time: 140
47330 Server--1 Delivery person 39 delivered 51 packages, total distance: 808, total time: 145
47331 Server--1 Delivery person 40 delivered 48 packages, total distance: 832, total time: 148
47332 Server--1 Delivery person 41 delivered 54 packages, total distance: 839, total time: 147
47333 Server--1 Delivery person 42 delivered 54 packages, total distance: 871, total time: 153
47334 Server--1 Delivery person 43 delivered 51 packages, total distance: 875, total time: 154
47335 Server--1 Delivery person 44 delivered 48 packages, total distance: 825, total time: 148
47336 Server--1 Delivery person 45 delivered 51 packages, total distance: 807, total time: 140
47337 Server--1 Delivery person 46 delivered 51 packages, total distance: 809, total time: 141
47338 Server--1 Delivery person 47 delivered 51 packages, total distance: 822, total time: 144
47339 Server--1 Delivery person 48 delivered 51 packages, total distance: 818, total time: 142
47340 Server--1 Delivery person 49 delivered 48 packages, total distance: 813, total time: 147
47341 Server--1 Delivery person 50 delivered 51 packages, total distance: 787, total time: 137
```