

## CSE-344 SYSTEM PROGRAMING FINAL PROJECT REPORT

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#### Usage:

**make** compiles **client.c** and **server.c**  
**make clean** deletes **.log** file **.o** files.

For server → `./PideShop 8080 4 6 10000`: 8080 is port, 4 cook count and 6 delivery count. 10000 is speed of deliverers.

For client → `./HungryVeryMuch 8080 100 15 15`: 8080 is port, 100 client count, 15 x coordinate and 15 y coordinate.

#### System Architecture:

Firstly I used functions for finding pseudo inverse of a 30 by 40 matrix having complex elements. These are:

```
typedef struct {  
    double real;  
    double imag;  
} complex;
```

```
typedef struct {  
    complex **data;  
    int rows;  
    int cols;  
} matrix;
```

#### **allocateMatrix**

- **Purpose:** Allocates memory for a matrix structure and initializes its dimensions (**rows** and **cols**).

#### **freeMatrix**

- **Purpose:** Frees the memory allocated for a matrix structure.

#### **conjugateTranspose**

- **Purpose:** Computes the conjugate transpose of matrix **A** and stores it in matrix **A\_conj\_trans**.

#### **matrixMultiply**

- **Purpose:** Computes the matrix multiplication of matrices **A** and **B** and stores the result in matrix **result**.

## luDecomp

- **Purpose:** Performs LU decomposition of matrix A and stores the lower triangular matrix L and upper triangular matrix U.

## luSolve

- **Purpose:** Solves a linear system using LU decomposition.

## pseudoInverse

- **Purpose:** Computes the pseudo-inverse of matrix A and stores it in matrix A\_pinv.

## fillMatrixRandom

- **Purpose:** Fills a matrix with random complex numbers.

## My pide structure:

```
typedef struct {  
    int id;  
    int clientSocketFd;  
    char status[20];  
    int x;  
    int y;  
} Pide;
```

This is my main structure. Hole project is depend on this structure. I hide every client's fd,id,status,x and y coordinates on this structure.

## My server information structure:

```
struct serverClientStruct {  
    int serverFd;  
    struct sockaddr_in serverInfo;  
    struct sockaddr_in clientInfo;  
} information;
```

This structure for letting manager thread to use server socket for communicating with clients.

## My queues

```
Pide *pide_queue;  
Pide *cooked_queue;  
Pide *delivery_queue;
```

These are my queues . Manager thread use pide queue. Fills required informations about pide like clientSocketFd for communicating, x and y coordinates for delivering and id.Status information changes on every stage.

## Global Variables:

int totalPides; keeps total pide count.  
int availableCook; keeps total cook count.  
int availableDeliveryPersonal; keeps total delivery count.  
int totalDelivered; keeps total delivered pide count.  
int townx; keeps x limit coordinate of town center  
int towny; keeps y limit coordinate of town center  
int deliverySpeed; keeps speed of delivery  
int logFd; keeps file descriptor of log file  
int \*cookPlace; keep which cook cooked how many pide.  
int \*deliveryPlace; keep which delivery delivered how many pide.  
int oven\_spots = 6;  
int oven\_aparatus = 3;  
int oven\_opennings = 2;

## Signal Handlers:

```
void sigIntHandler(int sig) {  
    exitFlag = 1;  
    pthread_cond_broadcast(&delivery_ready);  
    pthread_cond_broadcast(&pide_ready);  
    pthread_cond_broadcast(&finish);  
}  
exitFlag for ending all ongoing loops.  
Broadcasts for let exiting all waiting threads on cond variables.
```

## My threads:

### Manager Thread:

This thread function is responsible for coordinating the entire process of taking orders from clients, assigning cooks and delivery personnel, managing queues, logging operations, and communicating with customers.

Reads the initial customerCount from the first client, which indicates how many customers (and therefore, how many pides) are expected to be served.

Reads clientPid (client process ID)

And x, y coordinates representing the town's geographical location from the client.

Then it reads orders and places of customers. It assign them to pide queue and deliver it to cook thread for letting them cook.

Communicates with the client by sending acknowledgment messages like "Order Placed" after successfully placing an order.

When all customers have been served (customerCount == 0), it waits for all pending operations (cooking and delivery) to finish (pthread\_cond\_wait(&finish, &cooked\_queue\_lock)).

Calculates and logs the best-performing cook and delivery personnel based on the number of tasks completed.

Resets internal counters and frees memory allocated for queues (pide\_queue, cooked\_queue, delivery\_queue) to prepare for the next batch of orders.

When exit flag received from ctrl + c it breaks the loop and exits.

### **Cook Thread:**

Extracts cook\_id from the passed argument and immediately frees the allocated memory for arg for other cook threads.

Allocates two matrices (mat and matPinv) using a custom function allocateMatrix and fills mat with random data using fillMatrixRandom. This for calculating pseudo inverse.

Enters a loop that continues until exitFlag becomes true (indicating the program should exit when user press ctrl + c).

Acquires the pide\_queue\_lock mutex to safely access and modify the pide\_queue.

Waiting for Pides:

Uses a condition variable pide\_ready to wait until there is at least one pide order (pide\_count > 0) in the pide\_queue. Manager thread insert them in pide queue and send signal when it insert it one.

If exitFlag becomes true during this waiting period, it releases the lock and breaks out of the loop to exit the thread.

Processing Pide Order:

Once a pide order is available, dequeues (--pide\_count) the pide from pide\_queue.

Then it add it to cooked queue for usage on delivery thread.

Calculates the pseudo-inverse of matrix mat using pseudoInverse function and stores it in matPinv. Additionally hides the time passed on executing pseudoInverse function for sleeping on cooking half of the that time.

Updates the status of the pide to "Prepared", logs this action, and notifies the client that their order is prepared.

Updates statistics (cookPlace[cook\_id]) to track how many pides each cook has prepared for promoting hardworking cook.

Handling Oven Capacity,aparat and opennings:

Acquires the cooked\_queue\_lock mutex to manage access to the cooked\_queue and oven\_spots (available oven spots).

Uses a condition variable delivery\_ready to wait until there is an available spot in the oven (oven\_spots > 0), there is a oven aparatus available or one of the oven opening is available.

If exitFlag becomes true during this waiting period, it releases the lock and breaks out of the loop to exit the thread.

Cooking:

Simulates the cooking process by decrementing oven\_spots (assuming each cook uses one spot).

On cooking decreases oven\_spots,oven\_aparat,oven\_opennings.

Sleeps for half of the time it took to compute the pseudo-inverse (executionTime / 2) to simulate the time needed to cook the pide.

After cooking, increments oven\_spots, oven\_aparat, oven\_opennings, updates the pide status to "Cooked", logs this action, and notifies the client that their order is cooked.

Signals the delivery\_ready condition variable to indicate that a cooked pide is ready for delivery.

### **Delivery Thread:**

Extracts delivery\_id from the passed argument and immediately frees the allocated memory for other delivery threads

Initializes a temporary buffer temp to store log messages.

Execution Loop:

Enters a loop that continues until exitFlag becomes true (indicating the program should exit on ctrl + c).

Waiting for Cooked Pides:

Acquires the cooked\_queue\_lock mutex to safely access and modify the cooked\_queue.

Uses a condition variable delivery\_ready to wait until there are cooked pides available for delivery (cooked\_count > 0).

If exitFlag becomes true during this waiting period, it releases the lock and breaks out of the loop to exit the thread.

Processing Delivery Orders:

When there are cooked pides in the cooked\_queue, dequeues (--cooked\_count) up to 3 pides for delivery.

Updates the status of each pide to "Delivered", logs this action, sends a delivery confirmation message to the client, and closes the client socket.

Updates statistics (deliveryPlace[delivery\_id]) to track how many deliveries each delivery thread has completed.

If fewer than 3 pides are available for delivery but the total number of pides minus those delivered is less than 3 (max\_pides - totalDelivered < 3), signals delivery\_ready to continue cooking more pides.

Simulating Delivery:

Calculates the distance between the delivery location (p.x, p.y) and the town center (townx/2, towny/2) using the Euclidean distance formula.

Sleeps for a simulated delivery time based on the distance and deliverySpeed.

Handling Remaining Pides:

If there are still cooked pides left in cooked\_queue after delivering up to 3 pides, immediately signaling delivery\_ready for delivering this orders too. Because there will be no more orders and deliverers should not be waiting for their pides to become 3.

I have thread pool for cook and delivery threads. These threads do not exit until program exits or interrupted by a signal. They always wait for manager's orders. In main I am getting them from user as argument.

I have used mutexes for preventing race conditions and data corruptions.

`max_pides - totalDelivered == 0` This means all deliveries have been delivered and order can be done by manager.

### **Main Function:**

Opens or creates a log file named "server.log" with appropriate permissions (`O_CREAT | O_WRONLY | O_TRUNC, S_IRUSR | S_IWUSR`).

Checks if the file descriptor (`logFileFd`) is valid and exits with an error message if not.

Sets up a signal handler (`sigIntHandler`) for handling the SIGINT signal.

Gets command line arguments from user for fulfilling arguments.

Validates that each of the arguments (`argv[1]` to `argv[4]`) can be converted to integers (portnumber, `CookthreadPoolSize`, `DeliveryPoolSize`, `k`). If any conversion fails, prints an error message and exits.

Uses `socket()` to create a TCP socket (`AF_INET, SOCK_STREAM`).

Configures the server socket (`serverSocketFd`) with address (`serverInfo`) and port number.

Binds the socket to the server address. If binding fails, prints an error, closes the socket, and exits.

Sets the socket to listen for incoming connections (`listen()`).

### **Thread Initialization:**

#### **Manager Thread:**

Creates a manager thread (`pthread_create`) to handle incoming client connections. Passes `serverSocketFd` as an argument (`managerThreadFunc`).

#### **Cook Threads:**

Creates an array of cook threads (`cookThreads`) based on `CookthreadPoolSize`.

Each cook thread is created with a unique `cookId`, which identifies its position in the thread pool (`pthread_create`).

#### **Delivery Threads:**

Creates an array of delivery threads (`deliveryThreads`) based on `DeliveryPoolSize`.

Each delivery thread is created with a unique `deliveryId` (`pthread_create`).

Waits for the manager thread and all cook and delivery threads to finish execution (`pthread_join`).

Frees dynamically allocated memory used for thread IDs (`cookId`, `deliveryId`), thread arrays (`cookThreads`, `deliveryThreads`), and other data structures (`pide_queue`, `cooked_queue`, `delivery_queue`, `deliveryPlace`, `cookPlace`).

Closes the log file descriptor (`logFileFd`) and the server socket (`serverSocketFd`).

## Client Generator:

### Client Struct (client\_info\_t):

Holds client information: clientId, hostname, port, x, y, clientCount, townx, towny. And pass them to handle\_client thread.

### handle\_client Function:

Thread function for each client:

Creates a socket and connects to the server.

Sends client details to the server (for the first client).

Sends client position to the server.

Then receives and prints status messages from the server for 4 times because of 4 status type.

### Main Function:

Parses command-line arguments (port, number of clients, town dimensions).

Spawns threads for each client using pthread\_create.

Waits for all client threads to finish with pthread\_join.

Mutexes: Ensures thread-safe access to shared variables (clientNo, deliverPide).

Command-Line Arguments: Validates and processes input parameters.

Randomization: Generates random client positions within specified town dimensions and spawn new clients..

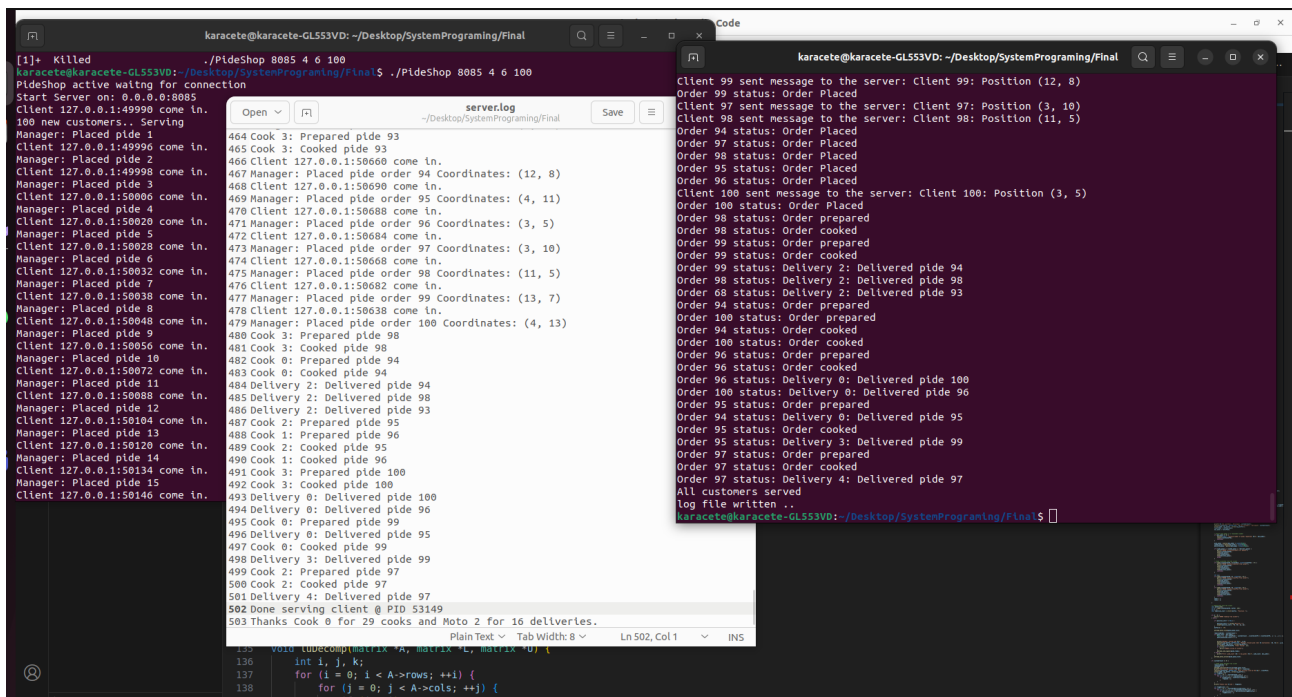
## Test Cases:

### For 50 Orders:

```
karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/Final$ ./server.log
Cook 2: Prepared pide 14
Cook 2: Cooked pide 14
Cook 1: Prepared pide 13
Cook 1: Cooked pide 13
Delivery 5: Delivered pide 13
Delivery 5: Delivered pide 14
Delivery 5: Delivered pide 15
Cook 0: Prepared pide 12
Cook 0: Cooked pide 12
Cook 3: Prepared pide 11
Cook 3: Cooked pide 11
Cook 2: Prepared pide 10
Cook 2: Cooked pide 10
Delivery 2: Delivered pide 10
Delivery 2: Delivered pide 11
Delivery 2: Delivered pide 12
Cook 1: Prepared pide 9
Cook 1: Cooked pide 9
Cook 0: Prepared pide 8
Cook 0: Cooked pide 8
Cook 3: Prepared pide 7
Cook 3: Cooked pide 7
Delivery 5: Delivered pide 7
Delivery 5: Delivered pide 8
Delivery 5: Delivered pide 9
Cook 2: Prepared pide 4
Cook 2: Cooked pide 4
Delivery 1: Delivered pide 4
Client 127.0.0.1:34794 come in.
Manager: Placed pide 50
Cook 1: Prepared pide 50
Cook 1: Cooked pide 50
Delivery 3: Delivered pide 50
Done serving client @ PID 50184
Thanks Cook 0 and Moto 2

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# For 100 Order

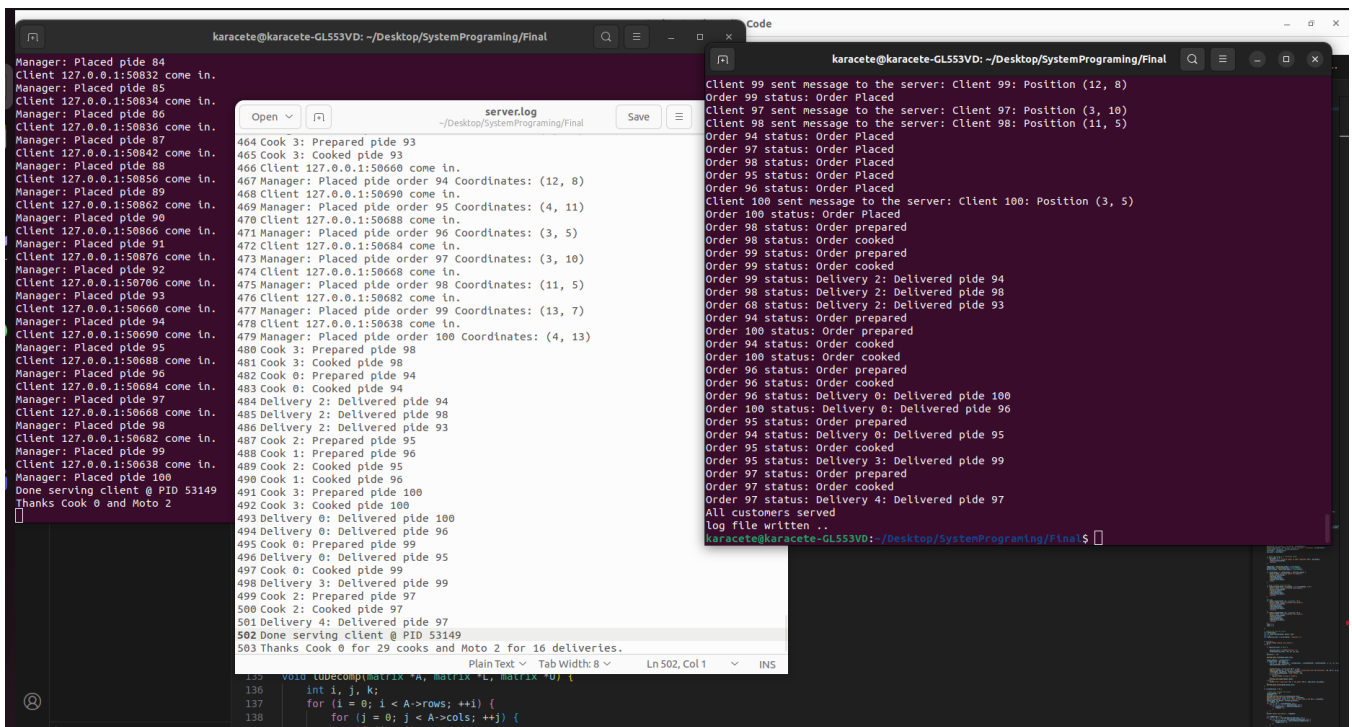


```
[1]+  Killed                  ./PideShop 8085 4 6 100
karacete@karacete-GL553VD: ~/Desktop/SystemPrograming/Final$ ./PideShop 8085 4 6 100
PideShop active waiting for connection
Start Server on: 0.0.0.0:8085
Client 127.0.0.1:49990 come in.
100 new customers. - Serving
Manager: Placed pide 1
Client 127.0.0.1:49996 come in.
Manager: Placed pide 2
Client 127.0.0.1:49998 come in.
Manager: Placed pide 3
Client 127.0.0.1:50006 come in.
Manager: Placed pide 4
Client 127.0.0.1:50020 come in.
Manager: Placed pide 5
Client 127.0.0.1:50028 come in.
Manager: Placed pide 6
Client 127.0.0.1:50032 come in.
Manager: Placed pide 7
Client 127.0.0.1:50038 come in.
Manager: Placed pide 8
Client 127.0.0.1:50048 come in.
Manager: Placed pide 9
Client 127.0.0.1:50056 come in.
Manager: Placed pide 10
Client 127.0.0.1:50072 come in.
Manager: Placed pide 11
Client 127.0.0.1:50088 come in.
Manager: Placed pide 12
Client 127.0.0.1:50104 come in.
Manager: Placed pide 13
Client 127.0.0.1:50120 come in.
Manager: Placed pide 14
Client 127.0.0.1:50134 come in.
Manager: Placed pide 15
Client 127.0.0.1:50146 come in.

serverlog
~/Desktop/SystemPrograming/Final
Save

464 Cook 3: Prepared pide 93
465 Cook 3: Cooked pide 93
466 Client 127.0.0.1:50660 come in.
467 Manager: Placed pide order 94 Coordinates: (12, 8)
468 Client 127.0.0.1:50690 come in.
469 Manager: Placed pide order 95 Coordinates: (4, 11)
470 Client 127.0.0.1:50688 come in.
471 Manager: Placed pide order 96 Coordinates: (3, 5)
472 Client 127.0.0.1:50684 come in.
473 Manager: Placed pide order 97 Coordinates: (3, 10)
474 Client 127.0.0.1:50668 come in.
475 Manager: Placed pide order 98 Coordinates: (11, 5)
476 Client 127.0.0.1:50682 come in.
477 Manager: Placed pide order 99 Coordinates: (13, 7)
478 Client 127.0.0.1:50638 come in.
479 Manager: Placed pide order 100 Coordinates: (4, 13)
480 Cook 3: Prepared pide 98
481 Cook 3: Cooked pide 98
482 Cook 0: Prepared pide 94
483 Cook 0: Cooked pide 94
484 Delivery 2: Delivered pide 94
485 Delivery 2: Delivered pide 98
486 Delivery 2: Delivered pide 93
487 Cook 2: Prepared pide 95
488 Cook 1: Prepared pide 96
489 Cook 2: Cooked pide 95
490 Cook 1: Cooked pide 96
491 Cook 3: Prepared pide 100
492 Cook 3: Cooked pide 100
493 Delivery 0: Delivered pide 100
494 Delivery 0: Delivered pide 96
495 Cook 0: Prepared pide 99
496 Delivery 0: Delivered pide 95
497 Cook 0: Cooked pide 99
498 Delivery 3: Delivered pide 99
499 Cook 2: Prepared pide 97
500 Cook 2: Cooked pide 97
501 Delivery 4: Delivered pide 97
502 Done serving client @ PID 53149
503 Thanks Cook 0 for 29 cooks and Moto 2 for 16 deliveries.

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```
Manager: Placed pide 84
Client 127.0.0.1:50832 come in.
Manager: Placed pide 85
Client 127.0.0.1:50834 come in.
Manager: Placed pide 86
Client 127.0.0.1:50836 come in.
Manager: Placed pide 87
Client 127.0.0.1:50842 come in.
Manager: Placed pide 88
Client 127.0.0.1:50856 come in.
Manager: Placed pide 89
Client 127.0.0.1:50862 come in.
Manager: Placed pide 90
Client 127.0.0.1:50866 come in.
Manager: Placed pide 91
Client 127.0.0.1:50876 come in.
Manager: Placed pide 92
Client 127.0.0.1:50786 come in.
Manager: Placed pide 93
Client 127.0.0.1:50660 come in.
Manager: Placed pide 94
Client 127.0.0.1:50600 come in.
Manager: Placed pide 95
Client 127.0.0.1:50688 come in.
Manager: Placed pide 96
Client 127.0.0.1:50684 come in.
Manager: Placed pide 97
Client 127.0.0.1:50668 come in.
Manager: Placed pide 98
Client 127.0.0.1:50682 come in.
Manager: Placed pide 99
Client 127.0.0.1:50638 come in.
Manager: Placed pide 100
Done serving client @ PID 53149
Thanks Cook 0 and Moto 2

serverlog
~/Desktop/SystemPrograming/Final
Save

464 Cook 3: Prepared pide 93
465 Cook 3: Cooked pide 93
466 Client 127.0.0.1:50660 come in.
467 Manager: Placed pide order 94 Coordinates: (12, 8)
468 Client 127.0.0.1:50690 come in.
469 Manager: Placed pide order 95 Coordinates: (4, 11)
470 Client 127.0.0.1:50688 come in.
471 Manager: Placed pide order 96 Coordinates: (3, 5)
472 Client 127.0.0.1:50684 come in.
473 Manager: Placed pide order 97 Coordinates: (3, 10)
474 Client 127.0.0.1:50668 come in.
475 Manager: Placed pide order 98 Coordinates: (11, 5)
476 Client 127.0.0.1:50682 come in.
477 Manager: Placed pide order 99 Coordinates: (13, 7)
478 Client 127.0.0.1:50638 come in.
479 Manager: Placed pide order 100 Coordinates: (4, 13)
480 Cook 3: Prepared pide 98
481 Cook 3: Cooked pide 98
482 Cook 0: Prepared pide 94
483 Cook 0: Cooked pide 94
484 Delivery 2: Delivered pide 94
485 Delivery 2: Delivered pide 98
486 Delivery 2: Delivered pide 93
487 Cook 2: Prepared pide 95
488 Cook 1: Prepared pide 96
489 Cook 2: Cooked pide 95
490 Cook 1: Cooked pide 96
491 Cook 3: Prepared pide 100
492 Cook 3: Cooked pide 100
493 Delivery 0: Delivered pide 100
494 Delivery 0: Delivered pide 96
495 Cook 0: Prepared pide 99
496 Delivery 0: Delivered pide 95
497 Cook 0: Cooked pide 99
498 Delivery 3: Delivered pide 99
499 Cook 2: Prepared pide 97
500 Cook 2: Cooked pide 97
501 Delivery 4: Delivered pide 97
502 Done serving client @ PID 53149
503 Thanks Cook 0 for 29 cooks and Moto 2 for 16 deliveries.

Plain Text  Tab Width: 8  Ln 502, Col 1  INS
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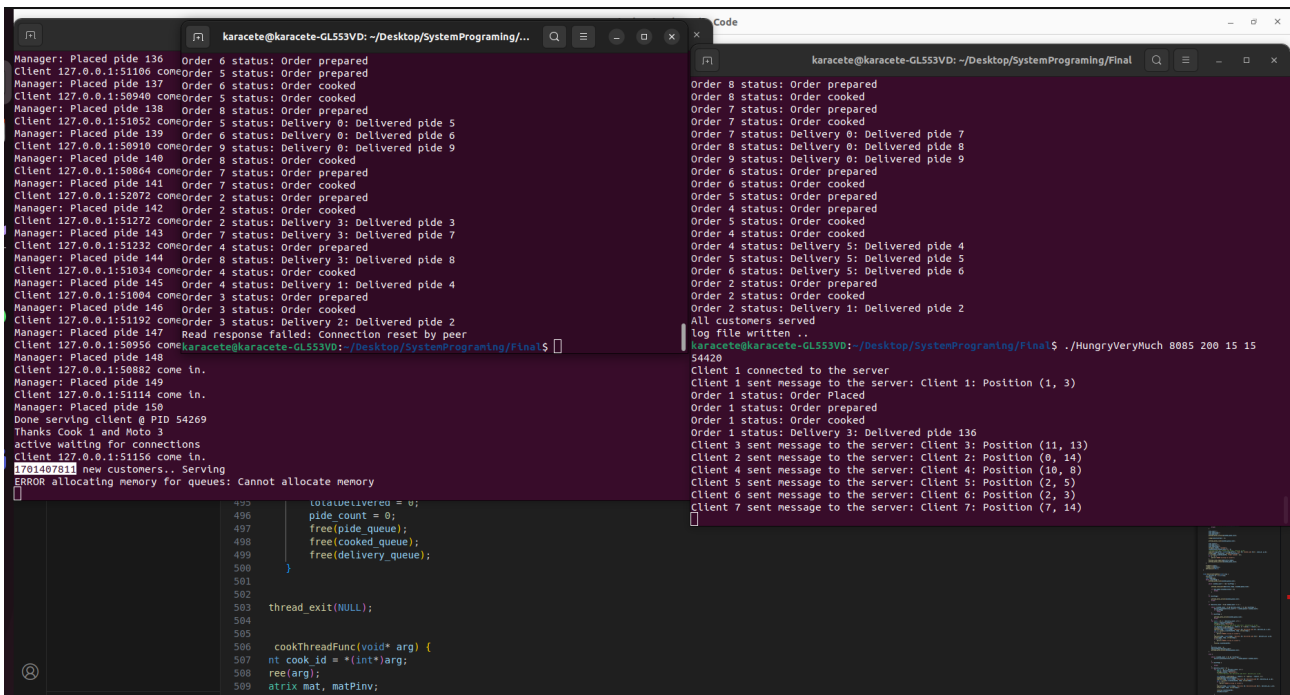


## For 200 Order after Calling 100 order

```
karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/Final
Client 127.0.0.1:38412 come in.
Manager: Placed pide 185
Client 127.0.0.1:38268 come in.
Manager: Placed pide 186
Client 127.0.0.1:38238 come in.
Manager: Placed pide 187
Client 127.0.0.1:39376 come in.
Manager: Placed pide 188
Client 127.0.0.1:39388 come in.
Manager: Placed pide 189
Client 127.0.0.1:38962 come in.
Manager: Placed pide 190
Client 127.0.0.1:39342 come in.
Manager: Placed pide 191
Client 127.0.0.1:39358 come in.
Manager: Placed pide 192
Client 127.0.0.1:39142 come in.
Manager: Placed pide 193
Client 127.0.0.1:39280 come in.
Manager: Placed pide 194
Client 127.0.0.1:38262 come in.
Manager: Placed pide 195
Client 127.0.0.1:38890 come in.
Manager: Placed pide 196
Client 127.0.0.1:39330 come in.
Manager: Placed pide 197
Client 127.0.0.1:38146 come in.
Manager: Placed pide 198
Client 127.0.0.1:38490 come in.
Manager: Placed pide 199
Client 127.0.0.1:38130 come in.
Manager: Placed pide 200
Done serving client @ PID 53945
Thanks Cook 0 and Moto 1
active waiting for connections
```

```
karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/Final
Client 127.0.0.1:38470 come in.
Manager: Placed pide 49
Client 127.0.0.1:38478 come in.
Manager: Placed pide 50
Client 127.0.0.1:38484 come in.
Manager: Placed pide 51
Client 127.0.0.1:38494 come in.
Manager: Placed pide 52
Client 127.0.0.1:38512 come in.
Manager: Placed pide 53
Client 127.0.0.1:38518 come in.
Manager: Placed pide 54
Client 127.0.0.1:38520 come in.
Manager: Placed pide 55
Client 127.0.0.1:38534 come in.
Manager: Placed pide 56
Client 127.0.0.1:38542 come in.
Manager: Placed pide 57
Client 127.0.0.1:38554 come in.
Manager: Placed pide 58
Client 127.0.0.1:38570 come in.
Manager: Placed pide 59
Client 127.0.0.1:38580 come in.
Manager: Placed pide 60
Client 127.0.0.1:38590 come in.
Manager: Placed pide 61
Client 127.0.0.1:38606 come in.
Manager: Placed pide 62
Client 127.0.0.1:38608 come in.
Manager: Placed pide 63
Client 127.0.0.1:38614 come in.
Manager: Placed pide 64
Client 127.0.0.1:38626 come in.
Manager: Placed pide 65
Client 127.0.0.1:38642 come in.
Manager: Placed pide 66
```

## Connecting another terminal while server communicating with a terminal



```
karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/...
Manager: Placed pide 136 Order 6 status: Order prepared
Client 127.0.0.1:51106 come in. Order 5 status: Order prepared
Manager: Placed pide 137 Order 6 status: Order cooked
Client 127.0.0.1:50940 come in. Order 5 status: Order cooked
Manager: Placed pide 138 Order 8 status: Order prepared
Client 127.0.0.1:51052 come in. Order 5 status: Delivery 0: Delivered pide 5
Manager: Placed pide 139 Order 6 status: Delivery 0: Delivered pide 6
Client 127.0.0.1:50910 come in. Order 9 status: Delivery 0: Delivered pide 9
Manager: Placed pide 140 Order 8 status: Order cooked
Client 127.0.0.1:50864 come in. Order 7 status: Order prepared
Manager: Placed pide 141 Order 7 status: Order cooked
Client 127.0.0.1:52072 come in. Order 2 status: Order prepared
Manager: Placed pide 142 Order 2 status: Order cooked
Client 127.0.0.1:51272 come in. Order 2 status: Delivery 3: Delivered pide 3
Manager: Placed pide 143 Order 7 status: Delivery 3: Delivered pide 7
Client 127.0.0.1:51232 come in. Order 4 status: Order prepared
Manager: Placed pide 144 Order 8 status: Delivery 3: Delivered pide 8
Client 127.0.0.1:51034 come in. Order 4 status: Order cooked
Manager: Placed pide 145 Order 4 status: Delivery 1: Delivered pide 4
Client 127.0.0.1:51004 come in. Order 3 status: Order prepared
Manager: Placed pide 146 Order 3 status: Order cooked
Client 127.0.0.1:51192 come in. Order 3 status: Delivery 2: Delivered pide 2
Manager: Placed pide 147 Read response failed: Connection reset by peer
Client 127.0.0.1:50956 come in.
Manager: Placed pide 148
Client 127.0.0.1:50882 come in.
Manager: Placed pide 149
Client 127.0.0.1:51114 come in.
Manager: Placed pide 150
Done serving client @ PID 54269
Thanks Cook 1 and Moto 3
active waiting for connections
Client 127.0.0.1:51159 come in.
1701407211 new customers - Serving
ERROR allocating memory for queues: Cannot allocate memory
492 totalDelivered = 0;
493 pide count = 0;
494 free(pide queue);
495 free(cooked queue);
496 free(delivery queue);
497 }
498
499 thread exit(NULL);
500
501
502
503
504
505
506 cookThreadFunc(void* arg) {
507 nt cook_id = *(int*)arg;
508 ree(arg);
509 atrix mat, matPinv;
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**Program does not get any problem when new customers send from terminal.**  
**Serverlog after 25,50,100,200 customers came in on same runnings.**

The screenshot shows the Visual Studio Code interface with three panels. The left panel is the Explorer showing the file structure. The middle panel is the server.log file, displaying a log of 200 customers being served. The right panel is the Terminal, showing the output of the program. The log and terminal output are as follows:

```
1 Client 127.0.0.1:45996 come in.
2 25 new customers.. Serving
3 Manager: Placed pide order 1 Coordinates: (10, 7)
4 Cook 0: Prepared pide 1
5 Cook 0: Cooked pide 1
6 Client 127.0.0.1:46002 come in.
7 Manager: Placed pide order 2 Coordinates: (8, 10)
8 Client 127.0.0.1:46000 come in.
9 Manager: Placed pide order 3 Coordinates: (8, 8)
10 Client 127.0.0.1:46008 come in.
11 Manager: Placed pide order 4 Coordinates: (9, 3)
12 Client 127.0.0.1:46010 come in.
13 Manager: Placed pide order 5 Coordinates: (14, 6)
14 Client 127.0.0.1:46014 come in.
15 Manager: Placed pide order 6 Coordinates: (0, 8)
16 Client 127.0.0.1:46024 come in.
17 Manager: Placed pide order 7 Coordinates: (1, 0)
18 Client 127.0.0.1:46028 come in.
19 Manager: Placed pide order 8 Coordinates: (3, 10)
20 Client 127.0.0.1:46042 come in.
21 Manager: Placed pide order 9 Coordinates: (1, 6)
22 Client 127.0.0.1:46054 come in.
23 Manager: Placed pide order 10 Coordinates: (13, 5)
24 Client 127.0.0.1:46062 come in.
25 Manager: Placed pide order 11 Coordinates: (2, 8)
26 Client 127.0.0.1:46072 come in.
27 Manager: Placed pide order 12 Coordinates: (10, 1)
28 Client 127.0.0.1:46074 come in.
29 Manager: Placed pide order 13 Coordinates: (4, 8)
30 Client 127.0.0.1:46092 come in.
31 Manager: Placed pide order 14 Coordinates: (11, 6)
32 Client 127.0.0.1:46080 come in.
33 Manager: Placed pide order 15 Coordinates: (9, 9)
34 Client 127.0.0.1:46106 come in.
35 Manager: Placed pide order 16 Coordinates: (1, 9)
36 Client 127.0.0.1:46110 come in.
37 Manager: Placed pide order 17 Coordinates: (7, 6)
38 Client 127.0.0.1:46114 come in.
39 Manager: Placed pide order 18 Coordinates: (1, 1)
40 Client 127.0.0.1:46118 come in.
41 Manager: Placed pide order 19 Coordinates: (1, 1)
42 Client 127.0.0.1:46122 come in.
43 Manager: Placed pide order 20 Coordinates: (1, 1)
44 Client 127.0.0.1:46126 come in.
45 Manager: Placed pide order 21 Coordinates: (1, 1)
46 Client 127.0.0.1:46130 come in.
47 Manager: Placed pide order 22 Coordinates: (1, 1)
48 Client 127.0.0.1:46134 come in.
49 Manager: Placed pide order 23 Coordinates: (1, 1)
50 Client 127.0.0.1:46138 come in.
51 Manager: Placed pide order 24 Coordinates: (1, 1)
52 Client 127.0.0.1:46142 come in.
53 Manager: Placed pide order 25 Coordinates: (1, 1)
54 Client 127.0.0.1:46146 come in.
55 Manager: Placed pide order 26 Coordinates: (1, 1)
56 Client 127.0.0.1:46150 come in.
57 Manager: Placed pide order 27 Coordinates: (1, 1)
58 Client 127.0.0.1:46154 come in.
59 Manager: Placed pide order 28 Coordinates: (1, 1)
60 Client 127.0.0.1:46158 come in.
61 Manager: Placed pide order 29 Coordinates: (1, 1)
62 Client 127.0.0.1:46162 come in.
63 Manager: Placed pide order 30 Coordinates: (1, 1)
64 Client 127.0.0.1:46166 come in.
65 Manager: Placed pide order 31 Coordinates: (1, 1)
66 Client 127.0.0.1:46170 come in.
67 Manager: Placed pide order 32 Coordinates: (1, 1)
68 Client 127.0.0.1:46174 come in.
69 Manager: Placed pide order 33 Coordinates: (1, 1)
70 Client 127.0.0.1:46178 come in.
71 Manager: Placed pide order 34 Coordinates: (1, 1)
72 Client 127.0.0.1:46182 come in.
73 Manager: Placed pide order 35 Coordinates: (1, 1)
74 Client 127.0.0.1:46186 come in.
75 Manager: Placed pide order 36 Coordinates: (1, 1)
76 Client 127.0.0.1:46190 come in.
77 Manager: Placed pide order 37 Coordinates: (1, 1)
78 Client 127.0.0.1:46194 come in.
79 Manager: Placed pide order 38 Coordinates: (1, 1)
80 Client 127.0.0.1:46198 come in.
81 Manager: Placed pide order 39 Coordinates: (1, 1)
82 Client 127.0.0.1:46202 come in.
83 Manager: Placed pide order 40 Coordinates: (1, 1)
84 Client 127.0.0.1:46206 come in.
85 Manager: Placed pide order 41 Coordinates: (1, 1)
86 Client 127.0.0.1:46210 come in.
87 Manager: Placed pide order 42 Coordinates: (1, 1)
88 Client 127.0.0.1:46214 come in.
89 Manager: Placed pide order 43 Coordinates: (1, 1)
90 Client 127.0.0.1:46218 come in.
91 Manager: Placed pide order 44 Coordinates: (1, 1)
92 Client 127.0.0.1:46222 come in.
93 Manager: Placed pide order 45 Coordinates: (1, 1)
94 Client 127.0.0.1:46226 come in.
95 Manager: Placed pide order 46 Coordinates: (1, 1)
96 Client 127.0.0.1:46230 come in.
97 Manager: Placed pide order 47 Coordinates: (1, 1)
98 Client 127.0.0.1:46234 come in.
99 Manager: Placed pide order 48 Coordinates: (1, 1)
100 Client 127.0.0.1:46238 come in.
101 Manager: Placed pide order 49 Coordinates: (1, 1)
102 Client 127.0.0.1:46242 come in.
103 Manager: Placed pide order 50 Coordinates: (1, 1)
104 Client 127.0.0.1:46246 come in.
105 Manager: Placed pide order 51 Coordinates: (1, 1)
106 Client 127.0.0.1:46250 come in.
107 Manager: Placed pide order 52 Coordinates: (1, 1)
108 Client 127.0.0.1:46254 come in.
109 Manager: Placed pide order 53 Coordinates: (1, 1)
110 Client 127.0.0.1:46258 come in.
111 Manager: Placed pide order 54 Coordinates: (1, 1)
112 Client 127.0.0.1:46262 come in.
113 Manager: Placed pide order 55 Coordinates: (1, 1)
114 Client 127.0.0.1:46266 come in.
115 Manager: Placed pide order 56 Coordinates: (1, 1)
116 Client 127.0.0.1:46270 come in.
117 Manager: Placed pide order 57 Coordinates: (1, 1)
118 Client 127.0.0.1:46274 come in.
119 Manager: Placed pide order 58 Coordinates: (1, 1)
120 Client 127.0.0.1:46278 come in.
121 Manager: Placed pide order 59 Coordinates: (1, 1)
122 Client 127.0.0.1:46282 come in.
123 Manager: Placed pide order 60 Coordinates: (1, 1)
124 Client 127.0.0.1:46286 come in.
125 Manager: Placed pide order 61 Coordinates: (1, 1)
126 Client 127.0.0.1:46290 come in.
127 Manager: Placed pide order 62 Coordinates: (1, 1)
128 Thanks Cook 0 for 7 cooks and Moto 2 for 4 deliveries.
129 active waiting for connections
130 Client 127.0.0.1:47612 come in.
131 50 new customers.. Serving
132 Manager: Placed pide order 1 Coordinates: (7, 5)
133 Cook 2: Prepared pide 1
134 Client 127.0.0.1:47616 come in.
135 Manager: Placed pide order 2 Coordinates: (11, 8)
136 Client 127.0.0.1:47630 come in.
137 Manager: Placed pide order 3 Coordinates: (6, 0)
138 Client 127.0.0.1:47642 come in.
139 Manager: Placed pide order 4 Coordinates: (10, 1)
140 Client 127.0.0.1:47650 come in.
141 Manager: Placed pide order 5 Coordinates: (7, 10)
142 Client 127.0.0.1:47660 come in.
143 Manager: Placed pide order 6 Coordinates: (11, 9)
144 Client 127.0.0.1:47662 come in.
145 Manager: Placed pide order 7 Coordinates: (1, 7)
146 Client 127.0.0.1:47672 come in.
147 Manager: Placed pide order 8 Coordinates: (13, 1)
148 Client 127.0.0.1:47678 come in.
149 Manager: Placed pide order 9 Coordinates: (7, 10)
150 Client 127.0.0.1:47688 come in.
151 Manager: Placed pide order 10 Coordinates: (14, 9)
152 Client 127.0.0.1:47704 come in.
153 Manager: Placed pide order 11 Coordinates: (8, 1)
154 Client 127.0.0.1:47708 come in.
155 Manager: Placed pide order 12 Coordinates: (11, 5)
156 Client 127.0.0.1:47716 come in.
157 Manager: Placed pide order 13 Coordinates: (6, 2)
158 Client 127.0.0.1:47734 come in.
```

```
cooked_count = 0;
delivery_count = 0;
totalDelivered = 0;
pide_count = 0;
free(pide_queue);
free(cooked_queue);
free(delivery_queue);
}
pthread_exit(NULL);
```

The screenshot shows the Visual Studio Code interface with three panels. The left panel is the Explorer showing the file structure. The middle panel is the server.log file, displaying a log of 250 customers being served. The right panel is the Terminal, showing the output of the program. The log and terminal output are as follows:

```
123 Delivery 5: Delivered pide 3
124 Delivery 5: Delivered pide 5
125 Cook 0: Cooked pide 25
126 Delivery 0: Delivered pide 25
127 Done serving client @ PID 58164
128 Thanks Cook 0 for 7 cooks and Moto 2 for 4 deliveries.
129 active waiting for connections
130 Client 127.0.0.1:47612 come in.
131 50 new customers.. Serving
132 Manager: Placed pide order 1 Coordinates: (7, 5)
133 Cook 2: Prepared pide 1
134 Client 127.0.0.1:47616 come in.
135 Manager: Placed pide order 2 Coordinates: (11, 8)
136 Client 127.0.0.1:47630 come in.
137 Manager: Placed pide order 3 Coordinates: (6, 0)
138 Client 127.0.0.1:47642 come in.
139 Manager: Placed pide order 4 Coordinates: (10, 1)
140 Client 127.0.0.1:47650 come in.
141 Manager: Placed pide order 5 Coordinates: (7, 10)
142 Client 127.0.0.1:47660 come in.
143 Manager: Placed pide order 6 Coordinates: (11, 9)
144 Client 127.0.0.1:47662 come in.
145 Manager: Placed pide order 7 Coordinates: (1, 7)
146 Client 127.0.0.1:47672 come in.
147 Manager: Placed pide order 8 Coordinates: (13, 1)
148 Client 127.0.0.1:47678 come in.
149 Manager: Placed pide order 9 Coordinates: (7, 10)
150 Client 127.0.0.1:47688 come in.
151 Manager: Placed pide order 10 Coordinates: (14, 9)
152 Client 127.0.0.1:47704 come in.
153 Manager: Placed pide order 11 Coordinates: (8, 1)
154 Client 127.0.0.1:47708 come in.
155 Manager: Placed pide order 12 Coordinates: (11, 5)
156 Client 127.0.0.1:47716 come in.
157 Manager: Placed pide order 13 Coordinates: (6, 2)
158 Client 127.0.0.1:47734 come in.
159 Manager: Placed pide order 14 Coordinates: (1, 1)
160 Client 127.0.0.1:47738 come in.
161 Manager: Placed pide order 15 Coordinates: (1, 1)
162 Client 127.0.0.1:47742 come in.
163 Manager: Placed pide order 16 Coordinates: (1, 1)
164 Client 127.0.0.1:47746 come in.
165 Manager: Placed pide order 17 Coordinates: (1, 1)
166 Client 127.0.0.1:47750 come in.
167 Manager: Placed pide order 18 Coordinates: (1, 1)
168 Client 127.0.0.1:47754 come in.
169 Manager: Placed pide order 19 Coordinates: (1, 1)
170 Client 127.0.0.1:47758 come in.
171 Manager: Placed pide order 20 Coordinates: (1, 1)
172 Client 127.0.0.1:47762 come in.
173 Manager: Placed pide order 21 Coordinates: (1, 1)
174 Client 127.0.0.1:47766 come in.
175 Manager: Placed pide order 22 Coordinates: (1, 1)
176 Client 127.0.0.1:47770 come in.
177 Manager: Placed pide order 23 Coordinates: (1, 1)
178 Client 127.0.0.1:47774 come in.
179 Manager: Placed pide order 24 Coordinates: (1, 1)
180 Client 127.0.0.1:47778 come in.
181 Manager: Placed pide order 25 Coordinates: (1, 1)
182 Client 127.0.0.1:47782 come in.
183 Manager: Placed pide order 26 Coordinates: (1, 1)
184 Client 127.0.0.1:47786 come in.
185 Manager: Placed pide order 27 Coordinates: (1, 1)
186 Client 127.0.0.1:47790 come in.
187 Manager: Placed pide order 28 Coordinates: (1, 1)
188 Client 127.0.0.1:47794 come in.
189 Manager: Placed pide order 29 Coordinates: (1, 1)
190 Client 127.0.0.1:47798 come in.
191 Manager: Placed pide order 30 Coordinates: (1, 1)
192 Client 127.0.0.1:47802 come in.
193 Manager: Placed pide order 31 Coordinates: (1, 1)
194 Client 127.0.0.1:47806 come in.
195 Manager: Placed pide order 32 Coordinates: (1, 1)
196 Client 127.0.0.1:47810 come in.
197 Manager: Placed pide order 33 Coordinates: (1, 1)
198 Client 127.0.0.1:47814 come in.
199 Manager: Placed pide order 34 Coordinates: (1, 1)
200 Client 127.0.0.1:47818 come in.
201 Manager: Placed pide order 35 Coordinates: (1, 1)
202 Client 127.0.0.1:47822 come in.
203 Manager: Placed pide order 36 Coordinates: (1, 1)
204 Client 127.0.0.1:47826 come in.
205 Manager: Placed pide order 37 Coordinates: (1, 1)
206 Client 127.0.0.1:47830 come in.
207 Manager: Placed pide order 38 Coordinates: (1, 1)
208 Client 127.0.0.1:47834 come in.
209 Manager: Placed pide order 39 Coordinates: (1, 1)
210 Client 127.0.0.1:47838 come in.
211 Manager: Placed pide order 40 Coordinates: (1, 1)
212 Client 127.0.0.1:47842 come in.
213 Manager: Placed pide order 41 Coordinates: (1, 1)
214 Client 127.0.0.1:47846 come in.
215 Manager: Placed pide order 42 Coordinates: (1, 1)
216 Client 127.0.0.1:47850 come in.
217 Manager: Placed pide order 43 Coordinates: (1, 1)
218 Client 127.0.0.1:47854 come in.
219 Manager: Placed pide order 44 Coordinates: (1, 1)
220 Client 127.0.0.1:47858 come in.
221 Manager: Placed pide order 45 Coordinates: (1, 1)
222 Client 127.0.0.1:47862 come in.
223 Manager: Placed pide order 46 Coordinates: (1, 1)
224 Client 127.0.0.1:47866 come in.
225 Manager: Placed pide order 47 Coordinates: (1, 1)
226 Client 127.0.0.1:47870 come in.
227 Manager: Placed pide order 48 Coordinates: (1, 1)
228 Client 127.0.0.1:47874 come in.
229 Manager: Placed pide order 49 Coordinates: (1, 1)
230 Client 127.0.0.1:47878 come in.
231 Manager: Placed pide order 50 Coordinates: (1, 1)
232 Client 127.0.0.1:47882 come in.
233 Manager: Placed pide order 51 Coordinates: (1, 1)
234 Client 127.0.0.1:47886 come in.
235 Manager: Placed pide order 52 Coordinates: (1, 1)
236 Client 127.0.0.1:47890 come in.
237 Manager: Placed pide order 53 Coordinates: (1, 1)
238 Client 127.0.0.1:47894 come in.
239 Manager: Placed pide order 54 Coordinates: (1, 1)
240 Client 127.0.0.1:47898 come in.
241 Manager: Placed pide order 55 Coordinates: (1, 1)
242 Client 127.0.0.1:47902 come in.
243 Manager: Placed pide order 56 Coordinates: (1, 1)
244 Client 127.0.0.1:47906 come in.
245 Manager: Placed pide order 57 Coordinates: (1, 1)
246 Client 127.0.0.1:47910 come in.
247 Manager: Placed pide order 58 Coordinates: (1, 1)
248 Client 127.0.0.1:47914 come in.
249 Manager: Placed pide order 59 Coordinates: (1, 1)
250 Client 127.0.0.1:47918 come in.
```

```
cooked_count = 0;
delivery_count = 0;
totalDelivered = 0;
pide_count = 0;
free(pide_queue);
free(cooked_queue);
free(delivery_queue);
}
pthread_exit(NULL);
```



File Edit Selection View Go Run Terminal Help

karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/...

```
Client 127.0.0.1:52354 come in.
Manager: Placed pide 191
Client 127.0.0.1:52668 come in.
Manager: Placed pide 192
Client 127.0.0.1:52764 come in.
Manager: Placed pide 193
Client 127.0.0.1:51992 come in.
Manager: Placed pide 194
Client 127.0.0.1:52120 come in.
Manager: Placed pide 195
Client 127.0.0.1:52466 come in.
Manager: Placed pide 196
Client 127.0.0.1:52478 come in.
Manager: Placed pide 197
Client 127.0.0.1:52466 come in.
Manager: Placed pide 198
Client 127.0.0.1:52380 come in.
Manager: Placed pide 199
Client 127.0.0.1:52316 come in.
Manager: Placed pide 200
Done serving client @ PID 58343
Thanks Cook 1 and Moto 5
active waiting for connections
```

377 Delivery 0: Delivered pide 6  
378 Cook 1: Prepared pide 4  
379 Cook 1: Cooked pide 4  
380 Delivery 3: Delivered pide 4  
381 Done serving client @ PID 58198  
382 Thanks Cook 1 for 22 cooks and Moto 2 for 11 deliveries.  
383 active waiting for connections  
384 Client 127.0.0.1:48052 come in.  
385 100 new customers.. Serving  
386 Manager: Placed pide order 1 Coordinates: (10, 7)  
387 Cook 2: Prepared pide 1  
388 Client 127.0.0.1:48066 come in.  
389 Manager: Placed pide order 2 Coordinates: (9, 3)  
390 Client 127.0.0.1:48074 come in.  
391 Manager: Placed pide order 3 Coordinates: (4, 10)  
392 Client 127.0.0.1:48080 come in.  
393 Manager: Placed pide order 4 Coordinates: (2, 9)  
394 Client 127.0.0.1:48094 come in.  
395 Manager: Placed pide order 5 Coordinates: (8, 2)  
396 Client 127.0.0.1:48100 come in.  
397 Manager: Placed pide order 6 Coordinates: (5, 1)  
398 Client 127.0.0.1:48104 come in.  
399 Manager: Placed pide order 7 Coordinates: (9, 3)  
400 Client 127.0.0.1:48120 come in.  
401 Manager: Placed pide order 8 Coordinates: (5, 7)  
402 Client 127.0.0.1:48126 come in.  
403 Manager: Placed pide order 9 Coordinates: (7, 4)  
404 Client 127.0.0.1:48132 come in.  
405 Manager: Placed pide order 10 Coordinates: (5, 7)  
406 Client 127.0.0.1:48142 come in.  
407 Manager: Placed pide order 11 Coordinates: (9, 8)  
408 Client 127.0.0.1:48158 come in.  
409 Manager: Placed pide order 12 Coordinates: (5, 0)  
410 Client 127.0.0.1:48164 come in.  
411 Manager: Placed pide order 13 Coordinates: (2, 4)  
412 Client 127.0.0.1:48166 come in.

```
delivery_count = 0;
totalDelivered = 0;
pide_count = 0;
free(pide_queue);
free(cooked_queue);
free(delivery_queue);
}

pthread_exit(NULL);
```

karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/...\$

```
Order 10 status: Order prepared
Order 10 status: Order cooked
Order 11 status: Order prepared
Order 11 status: Order cooked
Order 9 status: Order prepared
Order 9 status: Order cooked
Order 9 status: Delivery 3: Delivered pide 8
Order 11 status: Delivery 3: Delivered pide 11
Order 10 status: Delivery 3: Delivered pide 10
Order 8 status: Order prepared
Order 8 status: Order cooked
Order 3 status: Order prepared
Order 3 status: Order cooked
Order 2 status: Order prepared
Order 4 status: Order prepared
Order 4 status: Order cooked
Order 4 status: Delivery 5: Delivered pide 3
Order 3 status: Delivery 5: Delivered pide 4
Order 8 status: Delivery 5: Delivered pide 9
Order 2 status: Order cooked
Order 2 status: Delivery 0: Delivered pide 2
All customers served
log file written ..
karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/Flah$
```

server.c - Final - Visual Studio Code

karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/...

```
Client 127.0.0.1:52354 come in.
Manager: Placed pide 191
Client 127.0.0.1:52668 come in.
Manager: Placed pide 192
Client 127.0.0.1:52764 come in.
Manager: Placed pide 193
Client 127.0.0.1:51992 come in.
Manager: Placed pide 194
Client 127.0.0.1:52120 come in.
Manager: Placed pide 195
Client 127.0.0.1:52466 come in.
Manager: Placed pide 196
Client 127.0.0.1:52478 come in.
Manager: Placed pide 197
Client 127.0.0.1:52466 come in.
Manager: Placed pide 198
Client 127.0.0.1:52380 come in.
Manager: Placed pide 199
Client 127.0.0.1:52316 come in.
Manager: Placed pide 200
Done serving client @ PID 58343
Thanks Cook 1 and Moto 5
active waiting for connections
```

881 Delivery 4: Delivered pide 7  
882 Cook 3: Prepared pide 5  
883 Cook 3: Cooked pide 5  
884 Delivery 1: Delivered pide 5  
885 Done serving client @ PID 58242  
886 Thanks Cook 1 for 48 cooks and Moto 0 for 17 deliveries.  
887 active waiting for connections  
888 Client 127.0.0.1:51260 come in.  
889 200 new customers.. Serving  
890 Manager: Placed pide order 1 Coordinates: (3, 8)  
891 Cook 1: Prepared pide 1  
892 Client 127.0.0.1:51268 come in.  
893 Manager: Placed pide order 2 Coordinates: (4, 7)  
894 Client 127.0.0.1:51272 come in.  
895 Manager: Placed pide order 3 Coordinates: (13, 8)  
896 Client 127.0.0.1:51270 come in.  
897 Manager: Placed pide order 4 Coordinates: (4, 10)  
898 Client 127.0.0.1:51288 come in.  
899 Manager: Placed pide order 5 Coordinates: (14, 6)  
900 Client 127.0.0.1:51294 come in.  
901 Manager: Placed pide order 6 Coordinates: (11, 3)  
902 Client 127.0.0.1:51306 come in.  
903 Manager: Placed pide order 7 Coordinates: (7, 0)  
904 Client 127.0.0.1:51316 come in.  
905 Manager: Placed pide order 8 Coordinates: (11, 2)  
906 Client 127.0.0.1:51314 come in.  
907 Manager: Placed pide order 9 Coordinates: (3, 4)  
908 Client 127.0.0.1:51322 come in.  
909 Manager: Placed pide order 10 Coordinates: (8, 0)  
910 Client 127.0.0.1:51324 come in.  
911 Manager: Placed pide order 11 Coordinates: (0, 10)  
912 Client 127.0.0.1:51330 come in.  
913 Manager: Placed pide order 12 Coordinates: (12, 0)  
914 Client 127.0.0.1:51342 come in.  
915 Manager: Placed pide order 13 Coordinates: (2, 7)  
916 Client 127.0.0.1:51346 come in.

```
cooked_count = 0;
delivery_count = 0;
totalDelivered = 0;
pide_count = 0;
free(pide_queue);
free(cooked_queue);
free(delivery_queue);
}

pthread_exit(NULL);
```

karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/Flah\$

```
Order 10 status: Order prepared
Order 10 status: Order cooked
Order 11 status: Order prepared
Order 11 status: Order cooked
Order 9 status: Order prepared
Order 9 status: Order cooked
Order 9 status: Delivery 3: Delivered pide 8
Order 11 status: Delivery 3: Delivered pide 11
Order 10 status: Delivery 3: Delivered pide 10
Order 8 status: Order prepared
Order 8 status: Order cooked
Order 3 status: Order prepared
Order 3 status: Order cooked
Order 2 status: Order prepared
Order 4 status: Order prepared
Order 4 status: Order cooked
Order 4 status: Delivery 5: Delivered pide 3
Order 3 status: Delivery 5: Delivered pide 4
Order 8 status: Delivery 5: Delivered pide 9
Order 2 status: Order cooked
Order 2 status: Delivery 0: Delivered pide 2
All customers served
log file written ..
karacete@karacete-GL553VD: ~/Desktop/SystemProgramming/Flah$
```