**DOCUMENTATIE TEMA 2**

**SIMULATOR DE COZI**

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Cuprins:

1. Cerinte functionale …………………………………………………………………………....................... 3

2. Obiective ……………………………………………………………………………………...................... 3

2.1 Obiectiv principal ………………………………………………………………………...……….….. 3

2.2 Obiective secundare …………………………………………………………………………….….… 3

3. Analiza problemei …………………………………………………………………………........................ 4

Use case-uri / scenarii ………………………………………………………………………………... 4

4.Proiectare ……………………………………………………………………………………………......… 4

4.1 Structuri de date........................................................................................................................................4

4.2 Diagrama de clase..................................................................................................................................5

4.3 Algoritmi ................................................................................................................................................6

5. Implementare.................................................................................................................................................7

Testare..........................................................................................................................................................8

6. Concluzii si Dezvoltari Ulterioare...............................................................................................................51

7. Bibliografie..................................................................................................................................................52

# Cerinte Functionale

( cerintele problemei )

Generarea unor clienti definiti de ID, timpul sosirii in coada si timpul necesar pentru a fii servit (cand este primul din coada).

Implementarea unui sistem care permite distribuirea unui numar N de clienti in Q cozi diferite, astfel incat fiecare client sa astepte cat mai putin.

Functionarea in paralel a cozilor.

Informatiile referitoare la clienti sunt bine determinate intre anumite intervale.

Simularea se opreste cand nu mai sunt clienti sau cand timpul simularii a depasit timpul maxim al simularii.

# Obiective

## Obiectiv Principal:

(obiectivul principal al proiectului)

Obiectivul principal al proiectului este de a creea o unealta utila in procesarea unor astfel de cozi. Astfel, definim o clasa Client (care va retine informatiile utile pentru simulare) si cream cozi de Clienti.

## Obiective Secundare:

(pasii care conduc catre atingerea obiectivului principal )

|  |  |  |
| --- | --- | --- |
| **Obiectiv Secundar** | **Descriere** | **Capitol** |
| Alegerea structurilor de date | Structurile de date folosite pentru a modela problema. | 4 |
| Impartirea pe clase | Modelarea logic a realitatii. | 4 |
| Dezvoltarea algoritmilor | Descrierea structurilor de date necesare pentru indeplinirea obiectivului principal si algoritmi care sa permita realizarea acestuia. | 4 |
| Implementarea solutiei | Va fi descrisa fiecare clasa cu campurile si metodele specifice. | 5 |

# Analiza Problemei

# Use-case-uri / Scenarii

Utilizator introduce prin intermediul fisierelor limitele legate de clienti, cozi si simulare. Astfel, se citesc in ordine : numarul de clienti N, numarul de cozi disponibile Q, timpul simularii maxim, si intervalele care definesc limitele referitoare la timpul in care se proceseaza clientii.

Pentru ca sistemul sa opereze in mod corect, trebuie sa asiguram validitatea sintactica a polinoamelor care reprezinta datele de intrare.

( etapele de proiectare )

## Structuri de date

(structurile de date folosite in program)

Pentru crearea clasei Client s-au folosit urmatoarele campuri definitorii :

private int id**;**private int arrivalTime**;**private int serviceTime**;**

si auxiliarul

private int waitingTime = **0;**

pentru a putea calcula statistica legata de eficienta cozilor.

arrivalTime – timpul la care clientul e gata sa se aseze la o coada

serviceTime – timpul in care este servit (cat dureaza serviciul)

waitingTime - cat timp a stat la coada clientul

Pentru crearea clasei Queue s-a folosit un singur camp :

private ArrayList<Client> clientsQueue **;**

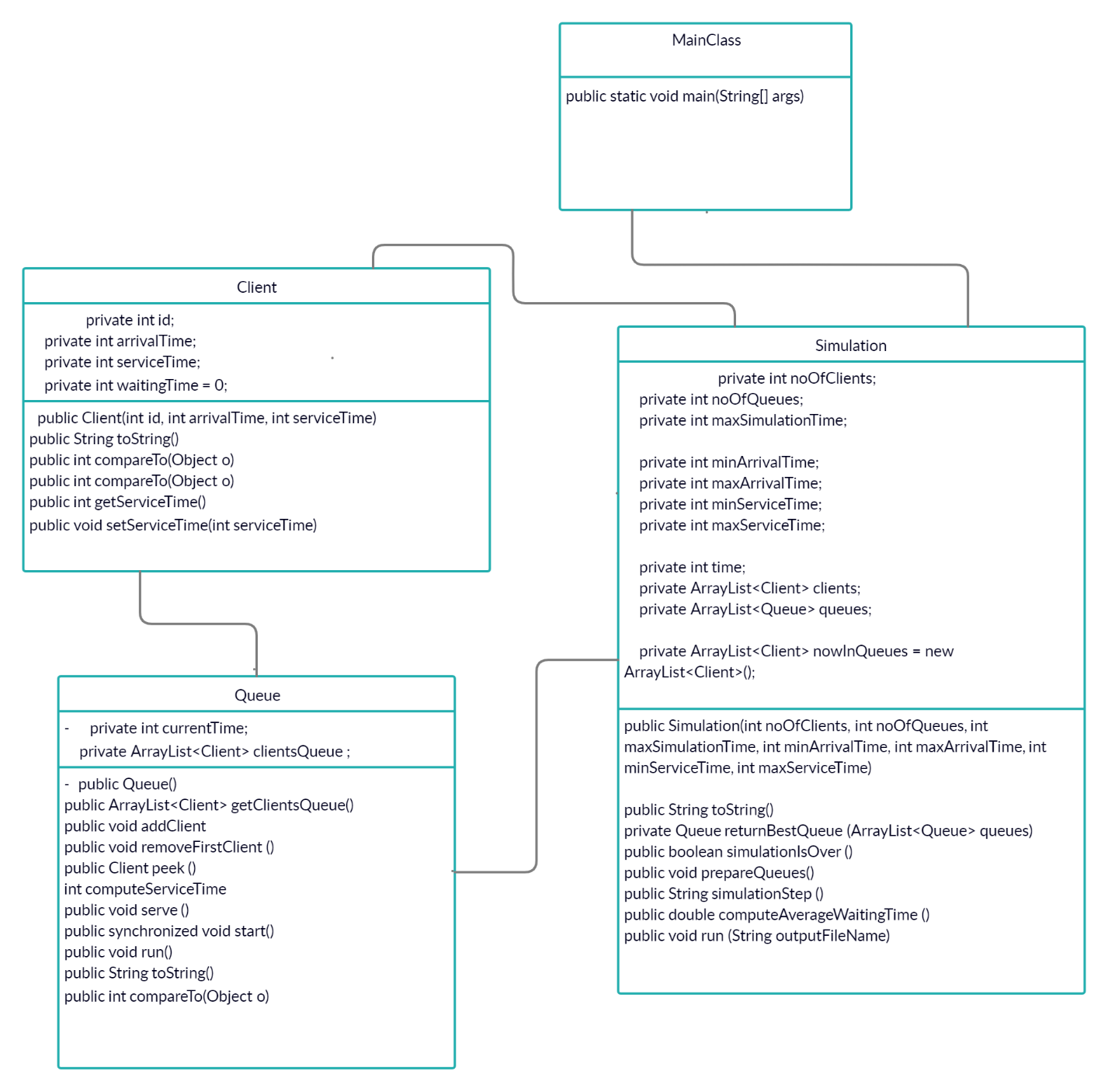
Aceasta clasa este de asemenea una mostenitoare a clasei Thread.

Pentru crearea clasei Simulation s-au folosit toate campurile citite din fisier + cele auxiliare pentru indeplinirea obiectivului :

private int noOfClients**;**private int noOfQueues**;**private int maxSimulationTime**;**private int minArrivalTime**;**private int maxArrivalTime**;**private int minServiceTime**;**private int maxServiceTime**;**private int time**;**private ArrayList<Client> clients**;**private ArrayList<Queue> queues**;**private ArrayList<Client> nowInQueues = new ArrayList<Client>()**;**

## Diagrama de clase

(schema UML a proiectului )



## Algoritmi

Singurii algortmi folositi in acest proiect sunt cei care determina minime.

Exemplu:

Queue bestQueue = queues.get(**0**)**;**for (Queue queue : queues){  
 if (queue.compareTo(bestQueue) < **0**){  
 bestQueue = queue**;** }  
}  
return bestQueue**;**

# Implementare

Clasa Client

public class Client implements Comparable{  
 private int id**;** private int arrivalTime**;** private int serviceTime**;** private int waitingTime = **0;**

Aceasta clasa contine campurile id, arrivalTime si serviceTime care definesc un client + campul auxiliar waitingTime.

Metodele importante (pe langa constructori, getter si setter) sunt :

public int compareTo(Object o) {  
 if (o instanceof Client){  
 Client comparableObject = (Client) o**;** if (arrivalTime < comparableObject.arrivalTime){ // 1a < 2a  
 return -**1;** }  
 else {  
 if (arrivalTime == comparableObject.arrivalTime){  
 if (serviceTime < comparableObject.serviceTime){ // 1a = 2a si 1s < 2s  
 return -**1;** }  
 else { // 1a = 2a si 1s > 2s  
 return **1;** }  
 }  
 else { // 1a > 2a  
 return **1;** }  
 }  
 }  
 else {  
 return **0;** }  
}

Clasa Queue

private ArrayList<Client> clientsQueue **;**

Aceasta clasa contine campul clientsQueue care defineste o coada.

Clasa Simulation

public class Simulation {  
 private int noOfClients**;** private int noOfQueues**;** private int maxSimulationTime**;** private int minArrivalTime**;** private int maxArrivalTime**;** private int minServiceTime**;** private int maxServiceTime**;** private int time**;** private ArrayList<Client> clients**;** private ArrayList<Queue> queues**;** private ArrayList<Client> nowInQueues = new ArrayList<Client>()**;**

Primele 7 campuri sunt cele citite ca date de intrare. Campul time reprezinta timpul global. Campul clients retine clientii generati random. Campul queues retine toate cozile disponibile, iar campul auxiliar nowInQueues este folosit pentru afisare eleganta.

**Testare**

1. in-test-2

50  
5  
60  
2,40  
1,7

Output : (unul dintre cele posibile avand in vedere ca generam random clientii)

Clients : 50  
Queues : 5  
MAX Simulation : 60  
MIN Arrival Time : 2  
MAX Arrival Time : 40  
MIN Service Time : 1  
MAX Service Time : 7  
Clients:  
(41,2,4 / wTime = 0) ;  
(8,3,6 / wTime = 0) ;  
(26,5,4 / wTime = 0) ;  
(37,5,4 / wTime = 0) ;  
(24,6,7 / wTime = 0) ;  
(5,7,1 / wTime = 0) ;  
(22,8,5 / wTime = 0) ;  
(50,9,2 / wTime = 0) ;  
(11,9,7 / wTime = 0) ;  
(1,10,2 / wTime = 0) ;  
(38,11,2 / wTime = 0) ;  
(6,11,5 / wTime = 0) ;  
(17,11,5 / wTime = 0) ;  
(25,12,1 / wTime = 0) ;  
(32,12,4 / wTime = 0) ;  
(47,12,4 / wTime = 0) ;  
(10,12,5 / wTime = 0) ;  
(16,12,6 / wTime = 0) ;  
(18,12,6 / wTime = 0) ;  
(44,12,6 / wTime = 0) ;  
(45,16,5 / wTime = 0) ;  
(34,17,3 / wTime = 0) ;  
(29,18,1 / wTime = 0) ;  
(27,18,6 / wTime = 0) ;  
(7,19,5 / wTime = 0) ;  
(20,19,5 / wTime = 0) ;  
(49,20,4 / wTime = 0) ;  
(4,21,1 / wTime = 0) ;  
(31,21,4 / wTime = 0) ;  
(14,22,5 / wTime = 0) ;  
(46,23,4 / wTime = 0) ;  
(13,25,5 / wTime = 0) ;  
(3,25,7 / wTime = 0) ;  
(33,26,6 / wTime = 0) ;  
(12,27,3 / wTime = 0) ;  
(28,27,4 / wTime = 0) ;  
(42,27,5 / wTime = 0) ;  
(23,27,6 / wTime = 0) ;  
(39,27,6 / wTime = 0) ;  
(36,28,6 / wTime = 0) ;  
(35,29,2 / wTime = 0) ;  
(9,30,7 / wTime = 0) ;  
(40,32,2 / wTime = 0) ;  
(2,33,4 / wTime = 0) ;  
(19,33,4 / wTime = 0) ;  
(48,33,6 / wTime = 0) ;  
(30,34,6 / wTime = 0) ;  
(43,35,6 / wTime = 0) ;  
(15,36,1 / wTime = 0) ;  
(21,38,1 / wTime = 0) ;  
  
  
Time : 1  
Waiting clients : (41,2,4 / wTime = 0) ;(8,3,6 / wTime = 0) ;(26,5,4 / wTime = 0) ;(37,5,4 / wTime = 0) ;(24,6,7 / wTime = 0) ;(5,7,1 / wTime = 0) ;(22,8,5 / wTime = 0) ;(50,9,2 / wTime = 0) ;(11,9,7 / wTime = 0) ;(1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 2  
Waiting clients : (41,2,4 / wTime = 0) ;(8,3,6 / wTime = 0) ;(26,5,4 / wTime = 0) ;(37,5,4 / wTime = 0) ;(24,6,7 / wTime = 0) ;(5,7,1 / wTime = 0) ;(22,8,5 / wTime = 0) ;(50,9,2 / wTime = 0) ;(11,9,7 / wTime = 0) ;(1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 3  
Waiting clients : (8,3,6 / wTime = 0) ;(26,5,4 / wTime = 0) ;(37,5,4 / wTime = 0) ;(24,6,7 / wTime = 0) ;(5,7,1 / wTime = 0) ;(22,8,5 / wTime = 0) ;(50,9,2 / wTime = 0) ;(11,9,7 / wTime = 0) ;(1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (41,2,3 / wTime = 1) ;  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 4  
Waiting clients : (26,5,4 / wTime = 0) ;(37,5,4 / wTime = 0) ;(24,6,7 / wTime = 0) ;(5,7,1 / wTime = 0) ;(22,8,5 / wTime = 0) ;(50,9,2 / wTime = 0) ;(11,9,7 / wTime = 0) ;(1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (41,2,2 / wTime = 2) ;  
Queue 2: (8,3,5 / wTime = 1) ;  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 5  
Waiting clients : (26,5,4 / wTime = 0) ;(37,5,4 / wTime = 0) ;(24,6,7 / wTime = 0) ;(5,7,1 / wTime = 0) ;(22,8,5 / wTime = 0) ;(50,9,2 / wTime = 0) ;(11,9,7 / wTime = 0) ;(1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (41,2,1 / wTime = 3) ;  
Queue 2: (8,3,4 / wTime = 2) ;  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 6  
Waiting clients : (24,6,7 / wTime = 0) ;(5,7,1 / wTime = 0) ;(22,8,5 / wTime = 0) ;(50,9,2 / wTime = 0) ;(11,9,7 / wTime = 0) ;(1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: (8,3,3 / wTime = 3) ;  
Queue 3: (26,5,3 / wTime = 1) ;  
Queue 4: (37,5,3 / wTime = 1) ;  
Queue 5: CLOSED  
---------------------  
  
Time : 7  
Waiting clients : (5,7,1 / wTime = 0) ;(22,8,5 / wTime = 0) ;(50,9,2 / wTime = 0) ;(11,9,7 / wTime = 0) ;(1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (24,6,6 / wTime = 1) ;  
Queue 2: (8,3,2 / wTime = 4) ;  
Queue 3: (26,5,2 / wTime = 2) ;  
Queue 4: (37,5,2 / wTime = 2) ;  
Queue 5: CLOSED  
---------------------  
  
Time : 8  
Waiting clients : (22,8,5 / wTime = 0) ;(50,9,2 / wTime = 0) ;(11,9,7 / wTime = 0) ;(1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (24,6,5 / wTime = 2) ;  
Queue 2: (8,3,1 / wTime = 5) ;  
Queue 3: (26,5,1 / wTime = 3) ;  
Queue 4: (37,5,1 / wTime = 3) ;  
Queue 5: CLOSED  
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Time : 9  
Waiting clients : (50,9,2 / wTime = 0) ;(11,9,7 / wTime = 0) ;(1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (24,6,4 / wTime = 3) ;  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: (22,8,4 / wTime = 1) ;  
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Time : 10  
Waiting clients : (1,10,2 / wTime = 0) ;(38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (24,6,3 / wTime = 4) ;  
Queue 2: (50,9,1 / wTime = 1) ;  
Queue 3: (11,9,6 / wTime = 1) ;  
Queue 4: CLOSED  
Queue 5: (22,8,3 / wTime = 2) ;  
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Time : 11  
Waiting clients : (38,11,2 / wTime = 0) ;(6,11,5 / wTime = 0) ;(17,11,5 / wTime = 0) ;(25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (24,6,2 / wTime = 5) ;  
Queue 2: CLOSED  
Queue 3: (11,9,5 / wTime = 2) ;  
Queue 4: (1,10,1 / wTime = 1) ;  
Queue 5: (22,8,2 / wTime = 3) ;  
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Time : 12  
Waiting clients : (25,12,1 / wTime = 0) ;(32,12,4 / wTime = 0) ;(47,12,4 / wTime = 0) ;(10,12,5 / wTime = 0) ;(16,12,6 / wTime = 0) ;(18,12,6 / wTime = 0) ;(44,12,6 / wTime = 0) ;(45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (17,11,5 / wTime = 1) ;(24,6,1 / wTime = 6) ;  
Queue 2: (38,11,1 / wTime = 1) ;  
Queue 3: (11,9,4 / wTime = 3) ;  
Queue 4: (6,11,5 / wTime = 0) ;  
Queue 5: (22,8,1 / wTime = 4) ;  
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Time : 13  
Waiting clients : (45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (44,12,6 / wTime = 0) ;(17,11,5 / wTime = 1) ;  
Queue 2: (47,12,4 / wTime = 0) ;(25,12,1 / wTime = 0) ;  
Queue 3: (10,12,5 / wTime = 1) ;(11,9,3 / wTime = 4) ;  
Queue 4: (16,12,6 / wTime = 1) ;(6,11,4 / wTime = 1) ;  
Queue 5: (18,12,6 / wTime = 0) ;(32,12,4 / wTime = 0) ;  
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Time : 14  
Waiting clients : (45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (44,12,6 / wTime = 1) ;(17,11,4 / wTime = 2) ;  
Queue 2: (47,12,4 / wTime = 0) ;  
Queue 3: (10,12,5 / wTime = 2) ;(11,9,2 / wTime = 5) ;  
Queue 4: (16,12,6 / wTime = 2) ;(6,11,3 / wTime = 2) ;  
Queue 5: (18,12,6 / wTime = 1) ;(32,12,3 / wTime = 1) ;  
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Time : 15  
Waiting clients : (45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (44,12,6 / wTime = 2) ;(17,11,3 / wTime = 3) ;  
Queue 2: (47,12,3 / wTime = 1) ;  
Queue 3: (10,12,5 / wTime = 3) ;(11,9,1 / wTime = 6) ;  
Queue 4: (16,12,6 / wTime = 3) ;(6,11,2 / wTime = 3) ;  
Queue 5: (18,12,6 / wTime = 2) ;(32,12,2 / wTime = 2) ;  
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Time : 16  
Waiting clients : (45,16,5 / wTime = 0) ;(34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (44,12,6 / wTime = 3) ;(17,11,2 / wTime = 4) ;  
Queue 2: (47,12,2 / wTime = 2) ;  
Queue 3: (10,12,5 / wTime = 3) ;  
Queue 4: (16,12,6 / wTime = 4) ;(6,11,1 / wTime = 4) ;  
Queue 5: (18,12,6 / wTime = 3) ;(32,12,1 / wTime = 3) ;  
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Time : 17  
Waiting clients : (34,17,3 / wTime = 0) ;(29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (44,12,6 / wTime = 4) ;(17,11,1 / wTime = 5) ;  
Queue 2: (45,16,5 / wTime = 1) ;(47,12,1 / wTime = 3) ;  
Queue 3: (10,12,4 / wTime = 4) ;  
Queue 4: (16,12,6 / wTime = 4) ;  
Queue 5: (18,12,6 / wTime = 3) ;  
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Time : 18  
Waiting clients : (29,18,1 / wTime = 0) ;(27,18,6 / wTime = 0) ;(7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (44,12,6 / wTime = 4) ;  
Queue 2: (45,16,5 / wTime = 1) ;  
Queue 3: (34,17,3 / wTime = 1) ;(10,12,3 / wTime = 5) ;  
Queue 4: (16,12,5 / wTime = 5) ;  
Queue 5: (18,12,5 / wTime = 4) ;  
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Time : 19  
Waiting clients : (7,19,5 / wTime = 0) ;(20,19,5 / wTime = 0) ;(49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (44,12,5 / wTime = 5) ;  
Queue 2: (29,18,1 / wTime = 1) ;(45,16,4 / wTime = 2) ;  
Queue 3: (34,17,3 / wTime = 2) ;(10,12,2 / wTime = 6) ;  
Queue 4: (27,18,6 / wTime = 1) ;(16,12,4 / wTime = 6) ;  
Queue 5: (18,12,4 / wTime = 5) ;  
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Time : 20  
Waiting clients : (49,20,4 / wTime = 0) ;(4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (20,19,5 / wTime = 1) ;(44,12,4 / wTime = 6) ;  
Queue 2: (29,18,1 / wTime = 2) ;(45,16,3 / wTime = 3) ;  
Queue 3: (34,17,3 / wTime = 3) ;(10,12,1 / wTime = 7) ;  
Queue 4: (27,18,6 / wTime = 2) ;(16,12,3 / wTime = 7) ;  
Queue 5: (7,19,5 / wTime = 1) ;(18,12,3 / wTime = 6) ;  
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Time : 21  
Waiting clients : (4,21,1 / wTime = 0) ;(31,21,4 / wTime = 0) ;(14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (20,19,5 / wTime = 2) ;(44,12,3 / wTime = 7) ;  
Queue 2: (49,20,4 / wTime = 1) ;(29,18,1 / wTime = 3) ;(45,16,2 / wTime = 4) ;  
Queue 3: (34,17,3 / wTime = 3) ;  
Queue 4: (27,18,6 / wTime = 3) ;(16,12,2 / wTime = 8) ;  
Queue 5: (7,19,5 / wTime = 2) ;(18,12,2 / wTime = 7) ;  
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Time : 22  
Waiting clients : (14,22,5 / wTime = 0) ;(46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (20,19,5 / wTime = 3) ;(44,12,2 / wTime = 8) ;  
Queue 2: (49,20,4 / wTime = 2) ;(29,18,1 / wTime = 4) ;(45,16,1 / wTime = 5) ;  
Queue 3: (31,21,4 / wTime = 1) ;(4,21,1 / wTime = 1) ;(34,17,2 / wTime = 4) ;  
Queue 4: (27,18,6 / wTime = 4) ;(16,12,1 / wTime = 9) ;  
Queue 5: (7,19,5 / wTime = 3) ;(18,12,1 / wTime = 8) ;  
---------------------  
  
Time : 23  
Waiting clients : (46,23,4 / wTime = 0) ;(13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (20,19,5 / wTime = 4) ;(44,12,1 / wTime = 9) ;  
Queue 2: (14,22,5 / wTime = 0) ;(49,20,4 / wTime = 2) ;(29,18,1 / wTime = 4) ;  
Queue 3: (31,21,4 / wTime = 2) ;(4,21,1 / wTime = 2) ;(34,17,1 / wTime = 5) ;  
Queue 4: (27,18,6 / wTime = 4) ;  
Queue 5: (7,19,5 / wTime = 3) ;  
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Time : 24  
Waiting clients : (13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (20,19,5 / wTime = 4) ;  
Queue 2: (14,22,5 / wTime = 0) ;(49,20,4 / wTime = 2) ;  
Queue 3: (31,21,4 / wTime = 2) ;(4,21,1 / wTime = 2) ;  
Queue 4: (27,18,5 / wTime = 5) ;  
Queue 5: (46,23,4 / wTime = 1) ;(7,19,4 / wTime = 4) ;  
---------------------  
  
Time : 25  
Waiting clients : (13,25,5 / wTime = 0) ;(3,25,7 / wTime = 0) ;(33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (20,19,4 / wTime = 5) ;  
Queue 2: (14,22,5 / wTime = 1) ;(49,20,3 / wTime = 3) ;  
Queue 3: (31,21,4 / wTime = 2) ;  
Queue 4: (27,18,4 / wTime = 6) ;  
Queue 5: (46,23,4 / wTime = 2) ;(7,19,3 / wTime = 5) ;  
---------------------  
  
Time : 26  
Waiting clients : (33,26,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (13,25,5 / wTime = 1) ;(20,19,3 / wTime = 6) ;  
Queue 2: (14,22,5 / wTime = 2) ;(49,20,2 / wTime = 4) ;  
Queue 3: (3,25,7 / wTime = 1) ;(31,21,3 / wTime = 3) ;  
Queue 4: (27,18,3 / wTime = 7) ;  
Queue 5: (46,23,4 / wTime = 3) ;(7,19,2 / wTime = 6) ;  
---------------------  
  
Time : 27  
Waiting clients : (12,27,3 / wTime = 0) ;(28,27,4 / wTime = 0) ;(42,27,5 / wTime = 0) ;(23,27,6 / wTime = 0) ;(39,27,6 / wTime = 0) ;(36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (13,25,5 / wTime = 2) ;(20,19,2 / wTime = 7) ;  
Queue 2: (14,22,5 / wTime = 3) ;(49,20,1 / wTime = 5) ;  
Queue 3: (3,25,7 / wTime = 2) ;(31,21,2 / wTime = 4) ;  
Queue 4: (33,26,6 / wTime = 1) ;(27,18,2 / wTime = 8) ;  
Queue 5: (46,23,4 / wTime = 4) ;(7,19,1 / wTime = 7) ;  
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Time : 28  
Waiting clients : (36,28,6 / wTime = 0) ;(35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (42,27,5 / wTime = 1) ;(13,25,5 / wTime = 3) ;(20,19,1 / wTime = 8) ;  
Queue 2: (28,27,4 / wTime = 0) ;(14,22,5 / wTime = 3) ;  
Queue 3: (3,25,7 / wTime = 3) ;(31,21,1 / wTime = 5) ;  
Queue 4: (23,27,6 / wTime = 1) ;(33,26,6 / wTime = 2) ;(27,18,1 / wTime = 9) ;  
Queue 5: (39,27,6 / wTime = 0) ;(12,27,3 / wTime = 0) ;(46,23,4 / wTime = 4) ;  
---------------------  
  
Time : 29  
Waiting clients : (35,29,2 / wTime = 0) ;(9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (42,27,5 / wTime = 1) ;(13,25,5 / wTime = 3) ;  
Queue 2: (28,27,4 / wTime = 1) ;(14,22,4 / wTime = 4) ;  
Queue 3: (36,28,6 / wTime = 0) ;(3,25,7 / wTime = 3) ;  
Queue 4: (23,27,6 / wTime = 1) ;(33,26,6 / wTime = 2) ;  
Queue 5: (39,27,6 / wTime = 1) ;(12,27,3 / wTime = 1) ;(46,23,3 / wTime = 5) ;  
---------------------  
  
Time : 30  
Waiting clients : (9,30,7 / wTime = 0) ;(40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (42,27,5 / wTime = 2) ;(13,25,4 / wTime = 4) ;  
Queue 2: (35,29,2 / wTime = 1) ;(28,27,4 / wTime = 2) ;(14,22,3 / wTime = 5) ;  
Queue 3: (36,28,6 / wTime = 1) ;(3,25,6 / wTime = 4) ;  
Queue 4: (23,27,6 / wTime = 2) ;(33,26,5 / wTime = 3) ;  
Queue 5: (39,27,6 / wTime = 2) ;(12,27,3 / wTime = 2) ;(46,23,2 / wTime = 6) ;  
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Time : 31  
Waiting clients : (40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (9,30,7 / wTime = 1) ;(42,27,5 / wTime = 3) ;(13,25,3 / wTime = 5) ;  
Queue 2: (35,29,2 / wTime = 2) ;(28,27,4 / wTime = 3) ;(14,22,2 / wTime = 6) ;  
Queue 3: (36,28,6 / wTime = 2) ;(3,25,5 / wTime = 5) ;  
Queue 4: (23,27,6 / wTime = 3) ;(33,26,4 / wTime = 4) ;  
Queue 5: (39,27,6 / wTime = 3) ;(12,27,3 / wTime = 3) ;(46,23,1 / wTime = 7) ;  
---------------------  
  
Time : 32  
Waiting clients : (40,32,2 / wTime = 0) ;(2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (9,30,7 / wTime = 2) ;(42,27,5 / wTime = 4) ;(13,25,2 / wTime = 6) ;  
Queue 2: (35,29,2 / wTime = 3) ;(28,27,4 / wTime = 4) ;(14,22,1 / wTime = 7) ;  
Queue 3: (36,28,6 / wTime = 3) ;(3,25,4 / wTime = 6) ;  
Queue 4: (23,27,6 / wTime = 4) ;(33,26,3 / wTime = 5) ;  
Queue 5: (39,27,6 / wTime = 3) ;(12,27,3 / wTime = 3) ;  
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Time : 33  
Waiting clients : (2,33,4 / wTime = 0) ;(19,33,4 / wTime = 0) ;(48,33,6 / wTime = 0) ;(30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (9,30,7 / wTime = 3) ;(42,27,5 / wTime = 5) ;(13,25,1 / wTime = 7) ;  
Queue 2: (40,32,2 / wTime = 0) ;(35,29,2 / wTime = 3) ;(28,27,4 / wTime = 4) ;  
Queue 3: (36,28,6 / wTime = 4) ;(3,25,3 / wTime = 7) ;  
Queue 4: (23,27,6 / wTime = 5) ;(33,26,2 / wTime = 6) ;  
Queue 5: (39,27,6 / wTime = 4) ;(12,27,2 / wTime = 4) ;  
---------------------  
  
Time : 34  
Waiting clients : (30,34,6 / wTime = 0) ;(43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (9,30,7 / wTime = 3) ;(42,27,5 / wTime = 5) ;  
Queue 2: (2,33,4 / wTime = 1) ;(40,32,2 / wTime = 1) ;(35,29,2 / wTime = 4) ;(28,27,3 / wTime = 5) ;  
Queue 3: (36,28,6 / wTime = 5) ;(3,25,2 / wTime = 8) ;  
Queue 4: (19,33,4 / wTime = 1) ;(23,27,6 / wTime = 6) ;(33,26,1 / wTime = 7) ;  
Queue 5: (48,33,6 / wTime = 1) ;(39,27,6 / wTime = 5) ;(12,27,1 / wTime = 5) ;  
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Time : 35  
Waiting clients : (43,35,6 / wTime = 0) ;(15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (9,30,7 / wTime = 4) ;(42,27,4 / wTime = 6) ;  
Queue 2: (2,33,4 / wTime = 2) ;(40,32,2 / wTime = 2) ;(35,29,2 / wTime = 5) ;(28,27,2 / wTime = 6) ;  
Queue 3: (30,34,6 / wTime = 1) ;(36,28,6 / wTime = 6) ;(3,25,1 / wTime = 9) ;  
Queue 4: (19,33,4 / wTime = 1) ;(23,27,6 / wTime = 6) ;  
Queue 5: (48,33,6 / wTime = 1) ;(39,27,6 / wTime = 5) ;  
---------------------  
  
Time : 36  
Waiting clients : (15,36,1 / wTime = 0) ;(21,38,1 / wTime = 0) ;  
Queue 1: (9,30,7 / wTime = 5) ;(42,27,3 / wTime = 7) ;  
Queue 2: (43,35,6 / wTime = 1) ;(2,33,4 / wTime = 3) ;(40,32,2 / wTime = 3) ;(35,29,2 / wTime = 6) ;(28,27,1 / wTime = 7) ;  
Queue 3: (30,34,6 / wTime = 1) ;(36,28,6 / wTime = 6) ;  
Queue 4: (19,33,4 / wTime = 2) ;(23,27,5 / wTime = 7) ;  
Queue 5: (48,33,6 / wTime = 2) ;(39,27,5 / wTime = 6) ;  
---------------------  
  
Time : 37  
Waiting clients : (21,38,1 / wTime = 0) ;  
Queue 1: (9,30,7 / wTime = 6) ;(42,27,2 / wTime = 8) ;  
Queue 2: (43,35,6 / wTime = 1) ;(2,33,4 / wTime = 3) ;(40,32,2 / wTime = 3) ;(35,29,2 / wTime = 6) ;  
Queue 3: (30,34,6 / wTime = 2) ;(36,28,5 / wTime = 7) ;  
Queue 4: (15,36,1 / wTime = 1) ;(19,33,4 / wTime = 3) ;(23,27,4 / wTime = 8) ;  
Queue 5: (48,33,6 / wTime = 3) ;(39,27,4 / wTime = 7) ;  
---------------------  
  
Time : 38  
Waiting clients : (21,38,1 / wTime = 0) ;  
Queue 1: (9,30,7 / wTime = 7) ;(42,27,1 / wTime = 9) ;  
Queue 2: (43,35,6 / wTime = 2) ;(2,33,4 / wTime = 4) ;(40,32,2 / wTime = 4) ;(35,29,1 / wTime = 7) ;  
Queue 3: (30,34,6 / wTime = 3) ;(36,28,4 / wTime = 8) ;  
Queue 4: (15,36,1 / wTime = 2) ;(19,33,4 / wTime = 4) ;(23,27,3 / wTime = 9) ;  
Queue 5: (48,33,6 / wTime = 4) ;(39,27,3 / wTime = 8) ;  
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Time : 39  
Waiting clients :   
Queue 1: (21,38,1 / wTime = 0) ;(9,30,7 / wTime = 7) ;  
Queue 2: (43,35,6 / wTime = 2) ;(2,33,4 / wTime = 4) ;(40,32,2 / wTime = 4) ;  
Queue 3: (30,34,6 / wTime = 4) ;(36,28,3 / wTime = 9) ;  
Queue 4: (15,36,1 / wTime = 3) ;(19,33,4 / wTime = 5) ;(23,27,2 / wTime = 10) ;  
Queue 5: (48,33,6 / wTime = 5) ;(39,27,2 / wTime = 9) ;  
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Time : 40  
Waiting clients :   
Queue 1: (21,38,1 / wTime = 1) ;(9,30,6 / wTime = 8) ;  
Queue 2: (43,35,6 / wTime = 3) ;(2,33,4 / wTime = 5) ;(40,32,1 / wTime = 5) ;  
Queue 3: (30,34,6 / wTime = 5) ;(36,28,2 / wTime = 10) ;  
Queue 4: (15,36,1 / wTime = 4) ;(19,33,4 / wTime = 6) ;(23,27,1 / wTime = 11) ;  
Queue 5: (48,33,6 / wTime = 6) ;(39,27,1 / wTime = 10) ;  
---------------------  
  
Time : 41  
Waiting clients :   
Queue 1: (21,38,1 / wTime = 2) ;(9,30,5 / wTime = 9) ;  
Queue 2: (43,35,6 / wTime = 3) ;(2,33,4 / wTime = 5) ;  
Queue 3: (30,34,6 / wTime = 6) ;(36,28,1 / wTime = 11) ;  
Queue 4: (15,36,1 / wTime = 4) ;(19,33,4 / wTime = 6) ;  
Queue 5: (48,33,6 / wTime = 6) ;  
---------------------  
  
Time : 42  
Waiting clients :   
Queue 1: (21,38,1 / wTime = 3) ;(9,30,4 / wTime = 10) ;  
Queue 2: (43,35,6 / wTime = 4) ;(2,33,3 / wTime = 6) ;  
Queue 3: (30,34,6 / wTime = 6) ;  
Queue 4: (15,36,1 / wTime = 5) ;(19,33,3 / wTime = 7) ;  
Queue 5: (48,33,5 / wTime = 7) ;  
---------------------  
  
Time : 43  
Waiting clients :   
Queue 1: (21,38,1 / wTime = 4) ;(9,30,3 / wTime = 11) ;  
Queue 2: (43,35,6 / wTime = 5) ;(2,33,2 / wTime = 7) ;  
Queue 3: (30,34,5 / wTime = 7) ;  
Queue 4: (15,36,1 / wTime = 6) ;(19,33,2 / wTime = 8) ;  
Queue 5: (48,33,4 / wTime = 8) ;  
---------------------  
  
Time : 44  
Waiting clients :   
Queue 1: (21,38,1 / wTime = 5) ;(9,30,2 / wTime = 12) ;  
Queue 2: (43,35,6 / wTime = 6) ;(2,33,1 / wTime = 8) ;  
Queue 3: (30,34,4 / wTime = 8) ;  
Queue 4: (15,36,1 / wTime = 7) ;(19,33,1 / wTime = 9) ;  
Queue 5: (48,33,3 / wTime = 9) ;  
---------------------  
  
Time : 45  
Waiting clients :   
Queue 1: (21,38,1 / wTime = 6) ;(9,30,1 / wTime = 13) ;  
Queue 2: (43,35,6 / wTime = 6) ;  
Queue 3: (30,34,3 / wTime = 9) ;  
Queue 4: (15,36,1 / wTime = 7) ;  
Queue 5: (48,33,2 / wTime = 10) ;  
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Time : 46  
Waiting clients :   
Queue 1: (21,38,1 / wTime = 6) ;  
Queue 2: (43,35,5 / wTime = 7) ;  
Queue 3: (30,34,2 / wTime = 10) ;  
Queue 4: CLOSED  
Queue 5: (48,33,1 / wTime = 11) ;  
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Time : 47  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: (43,35,4 / wTime = 8) ;  
Queue 3: (30,34,1 / wTime = 11) ;  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 48  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: (43,35,3 / wTime = 9) ;  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 49  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: (43,35,2 / wTime = 10) ;  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 50  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: (43,35,1 / wTime = 11) ;  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 51  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 52  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 53  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 54  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 55  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 56  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 57  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 58  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 59  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 60  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
---------------------  
  
Time : 61  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
Queue 3: CLOSED  
Queue 4: CLOSED  
Queue 5: CLOSED  
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Average waiting time : 6.18

1. in-test-1

4  
2  
60  
2,30  
2,4

Output :

Clients : 4  
Queues : 2  
MAX Simulation : 60  
MIN Arrival Time : 2  
MAX Arrival Time : 30  
MIN Service Time : 2  
MAX Service Time : 4  
Clients:  
(2,4,2 / wTime = 0) ;  
(1,7,4 / wTime = 0) ;  
(4,18,4 / wTime = 0) ;  
(3,21,3 / wTime = 0) ;  
  
  
Time : 1  
Waiting clients : (2,4,2 / wTime = 0) ;(1,7,4 / wTime = 0) ;(4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 2  
Waiting clients : (2,4,2 / wTime = 0) ;(1,7,4 / wTime = 0) ;(4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 3  
Waiting clients : (2,4,2 / wTime = 0) ;(1,7,4 / wTime = 0) ;(4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 4  
Waiting clients : (2,4,2 / wTime = 0) ;(1,7,4 / wTime = 0) ;(4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 5  
Waiting clients : (1,7,4 / wTime = 0) ;(4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: (2,4,1 / wTime = 1) ;  
Queue 2: CLOSED  
---------------------  
  
Time : 6  
Waiting clients : (1,7,4 / wTime = 0) ;(4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 7  
Waiting clients : (1,7,4 / wTime = 0) ;(4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 8  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: (1,7,3 / wTime = 1) ;  
Queue 2: CLOSED  
---------------------  
  
Time : 9  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: (1,7,2 / wTime = 2) ;  
Queue 2: CLOSED  
---------------------  
  
Time : 10  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: (1,7,1 / wTime = 3) ;  
Queue 2: CLOSED  
---------------------  
  
Time : 11  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 12  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 13  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 14  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 15  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 16  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 17  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 18  
Waiting clients : (4,18,4 / wTime = 0) ;(3,21,3 / wTime = 0) ;  
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 19  
Waiting clients : (3,21,3 / wTime = 0) ;  
Queue 1: (4,18,3 / wTime = 1) ;  
Queue 2: CLOSED  
---------------------  
  
Time : 20  
Waiting clients : (3,21,3 / wTime = 0) ;  
Queue 1: (4,18,2 / wTime = 2) ;  
Queue 2: CLOSED  
---------------------  
  
Time : 21  
Waiting clients : (3,21,3 / wTime = 0) ;  
Queue 1: (4,18,1 / wTime = 3) ;  
Queue 2: CLOSED  
---------------------  
  
Time : 22  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: (3,21,2 / wTime = 1) ;  
---------------------  
  
Time : 23  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: (3,21,1 / wTime = 2) ;  
---------------------  
  
Time : 24  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 25  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 26  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 27  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 28  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 29  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 30  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 31  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 32  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 33  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 34  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 35  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 36  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 37  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 38  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 39  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 40  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 41  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 42  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 43  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 44  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 45  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 46  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 47  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 48  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 49  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 50  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 51  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 52  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 53  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 54  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 55  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 56  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 57  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 58  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 59  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 60  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Time : 61  
Waiting clients :   
Queue 1: CLOSED  
Queue 2: CLOSED  
---------------------  
  
Average waiting time : 2.25

1. in-test-3

...

# Concluzii si Dezvoltari Ulterioare

In urma realizarii acestui proiect am invatat ca totul porneste de la idei. In loc sa stau sa analizez toate scenariile posibile, am trecut direct la implementare, revenind in nenumarate randuri si facand modificari asupra codului. Toate aceste impedimente puteau fii evitate cu putin mai multa rabdare.

Acest proiect poate fii dezvoltat prin introducerea unor noi functionalitati legate de eficienta si statistica cum ar fii :

Variarea numarul de clienti / cozi pentru a vedea cum se modifica timpii.

# Bibliografie

<https://stackoverflow.com/>

<https://www.youtube.com/>

Cursurile de POO / TP