IE306 System Simulation Homework 1 Report



Volkan Öztürk Arda Arslan 2019400033 2020400078

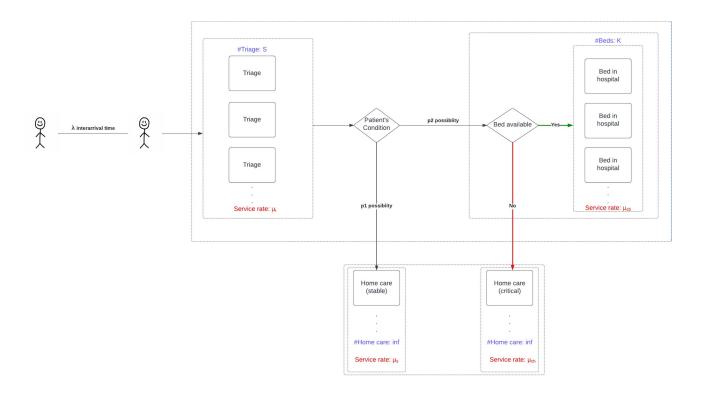
Group No. 32

Computer Engineering Department
Engineering Faculty
Bogazici University

This documentation includes following sections:

- 1) Conceptual Model of Hospital Simulation
- 2) Details of the Model
- 3) Flowchart
- 4) Pseudo-code
- 5) Hand Simulation
- 6) Simulation Results for Different Starting Conditions
- 7) Analysis of the Report

-Conceptual Model of Hospital Simulation



-Details of the model

Entities: Patient (P_i), Nurse (N_i), Bed(B_i)

Attributes: Arrival time of the patient, availabilty of nurse, availabilty of bed.

Types of events: Arrival, triage departure, bed arrival, bed departure, home_care arrival, home care departure.

Activities: Interarrival time (λ), nurse service time (μ_t), bed service time (μ_c), home service time for stable (μ_s), home service time for critical(μ_c h).

Delays: Time spent in triage queue.

System states: # patients waiting in triage, # busy nurses, # busy beds, # patients in home care (stable), # patients in home care (critical).

Random variables:

Interarrival time (λ): Used to generate time between consecutive patient arrivals.

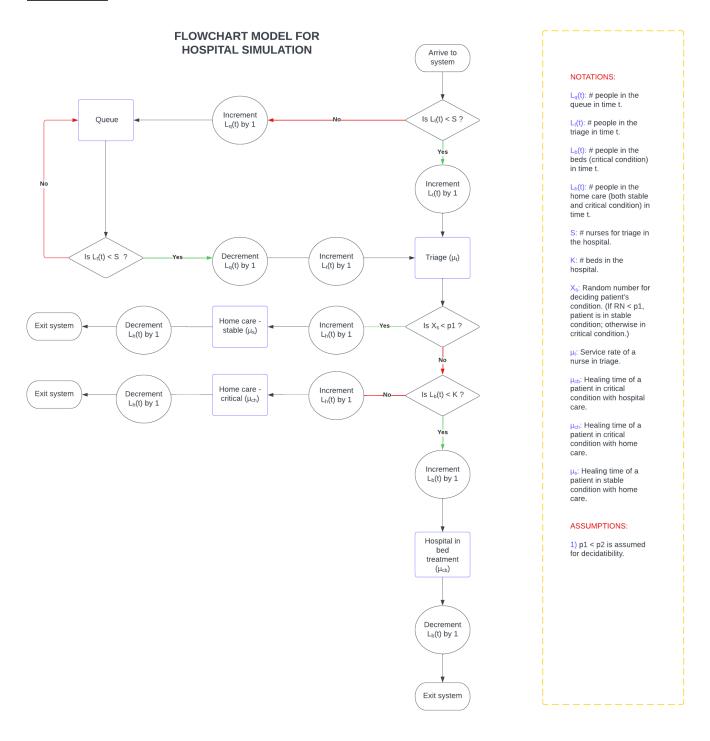
Nurse service time (μ_t): Used to generate service time for triage.

Bed service time (μ_{cb}): Used to generate service time for bedded hospital service.

Home healing time for stable (μ_{S}): Used to generate home healing time for stable patients.

Home healing time for critical(μ_{ch}): Used to generate home service time for critical patients.

-Flowchart



-Pseudo-code

```
Set L_a(t), L_t(t), L_b(t), L_h(t) to 0
Set X<sub>s</sub> to 0
Set time to 0
Set S, K, \mu_t, \mu_{cb}, \mu_{ch}, \mu_s from specified values
Set patient_queue (FIFO) to empty
Fill availabe nurse list (FIFO)
Fill availabe bed list (FIFO)
Set event gueue (priority gueue with respect to ascending time values) to empty
While (stopping condition):
   event is the front element of the event queue
   event is popped from the event gueue
   time is the event's time
   event is the event's type
   if the event is Arrival:
       if (L_t(t) < S):
           Increment L<sub>t</sub>(t) by 1
           Create Departure Triage event with service time Generate Nurse Service Time(µt)
           Add event to the event gueue.
       else:
           Increment La(t) by 1
           Add patient to the patient_queue
       Create Arrival event with interarrival time Generate_Interarrival(μt)
       Add event to the event queue
   if (event is Departure Triage):
       Decrement L<sub>t</sub>(t) by 1
       X<sub>s</sub> = Generate Random Number
       if (X_s < p1):
           Increment L<sub>h</sub>(t) by 1
           Create Treated at Home event with healing time Generate Home Healing Time(µs, s)
           Add event to the event queue.
       else:
           if (L_b(t) < K):
               Increment L<sub>b</sub>(t) by 1
               Create Treated at Home event with healing time Generate Hospital Healing Time(µcb)
               Add event to the event_queue.
           else:
               Increment Lh(t) by 1
               Create Treated at Hospital event with healing time Generate Home Healing Time(µch. c)
               Add event to the event queue.
       if (patient queue is not empty):
           patient is the front element of the patient queue
           Increment L<sub>t</sub>(t) by 1
           Create Departure Triage event with service time Generate Nurse Service Time(µt)alphaalpha
           Add event to the event queue.
   if (event is Treated at Home):
       Decrement L<sub>h</sub>(t) by 1
   if (event is Treated at Hospital):
       Decrement L<sub>b</sub>(t) by 1
```

-Hand Simulation

Interarrival Times:

	Time	Event Type	Patient ID	FEL	L	Lt	Lb:	Lg	Healed
0	_	Arrival		['[A @ 0.20914650	1	1	0	0	0
1	0.209146500485405			['[A @ 0.48912837	2	2	0	0	_
2	0.489128374369628			['[A @ 0.83598450	3	3	0	0	_
3	0.835984502066582			['[A @ 1.05664173	4	4	0	0	0
4	1.0566417392263			['[A @ 1.90199459	5	4	0	1	0
5	1.90199459029694			['[DT @ 2.7786391	6	4	0	2	0
6	2.77863912660182			['[A @ 3.14956246	6	4	1	1	_
7	3.14956246051209			['[DT @ 3.2148633	7	4	1	2	0
8	3.21486339415868			['[DT @ 3.8219032	7	4	2	1	
9	3.82190323162976	Departure_Triage		['[A @ 4.42047981	7	4	3	0	0
10	4.42047981252643			['[A @ 4.42540693	8	4	3	1	0
11	4.42540693508851			['[T_H @ 4.848247	9	4	3	2	0
12	4.84824712093146	Treated_at_Hospital	5	['[A @ 5.61183899 ›	8	4	2	2	1
13	5.61183899872293	Arrival		['[DT @ 6.7772556	9	4	2	3	1
14	6.77725563433077	Departure_Triage	4	['[DT @ 6.8681549	9	4	3	2	1
15	6.86815496232173	Departure_Triage	7	['[DT @ 7.0447078	9	4	4	1	1
16	7.04470782507765	Departure Triage	8	['[DT @ 7.3785662	9	4	5	0	1
17	7.37856621846291		3	['[A @ 7.59777423	9	3	6	0	1
18	7.59777423424492	Arrival	10	['[A @ 7.74162386	10	4	6	0	1
19	7.74162386257073	Arrival	11	['[T_H @ 7.952451	11	4	6	1	1
20	7.95245192460381	Treated_at_Hospital	8	['[T_H @ 8.405577	10	4	5	1	2
21	8.40557787603114	Treated at Hospital	3	['[DT @ 8.6896820	9	4	4	1	3
22	8.68968202052297	Departure Triage	6	['[A @ 8.88261487	9	4	5	0	3
23	8.88261487276844	Arrival	12	['[A @ 9.44285372	10	4	5	1	3
24	9.4428537202445	Arrival	13	['[DT @ 9.6599400	11	4	5	2	3
25	9.65994006986406	Departure Triage		['[A @ 9.70808613	11	4	5	1	3
26	9.70808613037367	Arrival	14	['[A @ 9.80629546	12	4	5	2	3
27	9.80629546730671	Arrival		['[DT @ 10.295321	13	4	5	3	3
28	10.2953214273734	Departure Triage		['[A @ 10.4630540	13	4	6	2	3
29	10.463054060666			['[DT @ 10.627081	14	4	6	3	3
30	10.6270810994515	Departure Triage		['[DT @ 10.641160	14	4	6	2	3
31	10.6411607286014			['[T H @ 10.71702	14	4	7	1	3
32	10.7170272732065			['[A @ 10.8805726	13	4	6	1	4
33	10.8805726829536			['[T Hm @ 10.9236	14	4	6	2	4
34	10.9236964401457			['[A @ 11.0220912	13	4	6	2	

0.20914650048	540506, 0.27998	1873884223,	0.34685	61276969539	5, 0.22065723715	972121, 0	.8453528	51070632	4, 1.2475	67870215	1543,
1.270917352014	13402, 0.0049271	22562076396	5, 1.1864	3206363442	17, 1.9859352355	219877, 0.	14384962	83258153	8, 1.1409	91010197	77068,
0.56023884747	60585, 0.265232	4101291708,	0.09820	93369330398	2, 0.65675859335	92494, 0.4	11751862	22876054	, 0.14151	85808609	6616]
Home Healing 1	Times for Stable	Patients:									
3.07241780192	0536, 0.2966153	4069418105]									
riage Nurse Se	ervice Times:										
9.65994006986	4062, 3.0057168	936732728, 2	.289510	752232194, 6	5.54258171639632	29, 3.9986	16507728	9475, 0.60	7039837	4710841,	
.867778788893	3205, 0.09089932	799096077, (0.176552	8627559220	8, 14.8152490478	02036, 2.6	97547193	1284893,	3.884426	26824352	22,
.967141029587	74304, 0.3458393	0122799134,	2.90221	9986814983	0.942638183274	3278]					
Hospital Bed Se	rvice Times:										
9.25444050814	254. 7.50216387	9047811. 1.02	2634388	9301696. 8.8	431550215961, 18	3.0184367	2704894.	0.9077440	9952616	2.	
	•				3 3994177211224		,			,	

-Simulation Results for Different Starting Conditions

-System: "Empty", Number of Healed Patients: "20"

Time									
1 0.200147 Arrival 1 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	_								
2 0.489128									
3 0.835985									
\$ 1.966642									~
5 1.901995	3 4								
6 2.778639 Departure_Triage	5								
7 3.149562	6								-
8 3.214863 Departure_Triage									
10		3.214863	Departure_Triage	1	7	4	2	1	0
11 4.425407	9	3.821903	Departure_Triage	5	7	4		0	0
12	10		Arrival	7	8	4	3	1	0
13 5.611839			Arrival						
14 6.777256 Departure_Triage 7 9 4 3 2 1 15 6.868155 Departure_Triage 7 9 4 4 1 1 16 7.044708 Departure_Triage 8 9 4 5 0 1 17 7.378566 Departure_Triage 8 9 4 5 0 1 17 7.378566 Departure_Triage 8 9 4 5 0 1 18 7.597774 Arrival 10 10 4 6 0 1 19 7.741624 Arrival 11 11 14 6 1 1 20 7.952452 Treated_at_Hospital 8 10 4 5 1 2 21 8.405578 Treated_at_Hospital 3 9 4 4 1 3 22 8.689682 Departure_Triage 6 9 4 5 0 3 23 8.882615 Arrival 12 10 4 5 1 3 24 9.442854 Arrival 13 11 4 5 2 3 25 9.659940 Departure_Triage 0 11 4 5 1 3 26 9.768946 Arrival 13 11 4 5 2 3 27 9.80629 Arrival 14 12 2 5 2 3 28 10.29521 Departure_Triage 10 13 4 6 2 3 29 10.463054 Arrival 15 13 4 5 3 3 29 10.463054 Arrival 16 14 6 3 3 30 10.67801 Departure_Triage 10 13 4 6 2 3 31 10.641161 Departure_Triage 11 13 4 6 1 4 33 10.880573 Arrival 17 14 4 6 2 4 34 10.923696 Treated_at_Hospital 1 13 4 6 1 4 35 11.022091 Arrival 18 1 4 6 2 5 36 11.037037 Arrival 18 1 4 6 2 5 37 11.583799 Departure_Triage 15 15 4 7 3 5 38 12.633080 Treated_at_Hospital 2 14 4 6 2 5 39 12.574108 Departure_Triage 15 1 4 6 6 2 5 31 10.464767 Treated_at_Home 12 13 4 6 2 5 31 12.57498 Departure_Triage 15 1 4 6 6 4 5 39 12.57498 Departure_Triage 15 1 4 6 6 3 6 39 12.57498 Departure_Triage 15 1 6 7 7 3 5 38 12.033080 Treated_at_Hospital 2 14 4 6 3 6 39 12.57498 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 19 15 4 6 3 6 39 12.57498 Departure_Triage 11 14 4 6 2 6 40 12.617399 Treated_at_Hospital 2 1 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6									
16 6.868155									_
16 7.044708 Departure_Triage 8 9 4 5 0 1 17 7.378566 Departure_Triage 3 9 3 6 0 1 18 7.597774 Arrival 10 10 4 6 0 1 19 7.741624 Arrival 11 11 4 6 1 1 20 7.952452 Treated_at_Hospital 8 10 4 5 1 2 21 8.405578 Treated_at_Hospital 3 9 4 4 1 3 22 8.689682 Departure_Triage 6 9 4 5 0 3 23 8.882615 Arrival 12 10 4 5 1 3 24 9.442854 Arrival 13 11 4 5 1 3 25 9.659940 Departure_Triage 0 11 4 5 1 3 26 9.769940 Departure_Triage 0 11 4 5 1 3 27 9.806295 Arrival 14 12 2 4 5 2 3 28 10.295321 Departure_Triage 10 13 4 6 2 3 29 10.463054 Arrival 15 13 4 5 3 3 29 10.463054 Arrival 16 14 4 6 3 3 30 10.637081 Departure_Triage 10 13 4 6 2 3 31 10.641161 Departure_Triage 11 13 4 6 1 4 32 10.717027 Treated_at_Hospital 1 13 4 6 1 4 33 10.808573 Arrival 17 14 6 6 2 5 34 10.923696 Treated_at_Home 12 13 4 6 2 5 35 11.037037 Arrival 18 14 6 6 2 5 36 11.037037 Arrival 19 15 4 6 4 5 37 11.583799 Departure_Triage 15 15 4 7 3 5 38 12.033080 Treated_at_Home 12 13 4 6 2 6 40 12.617399 Arrival 19 15 4 6 4 5 39 12.574108 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.73258 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 40 12.617399 Arrival 20 15 4 6 3 6 40 12.617399 Arrival 21 15 4 7 3 7 44 14.040578 Treated_at_Home 11 13 4 6 3 9 44 15.73258 Treated_at_Home 11 13 4 6 3 9 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 21 15 4 7 3 7 47 15.18533 Arrival 21 15 4 7 3 7 48 15.602411 Treated_at_Hospital 11 14 4 6 5 9 49 15.657564 Arrival 22 14 4 6 9 9 47 15.18533 Arrival 22 14 4 6 9 9 48 15.657564 Arrival 24 15 4 5 6 10 49 15.657564 Arrival 24 15 4 5 6 10 40.091731284591583 40.091731284591583 40.0929778433669 40.48080 Arrival 24 15 4 5 6 10 40.90372360779814738 40.48080 Arrival 24 15 4 5 6 10 40.90372360779814738 40.48080 Arrival 24 15 4 5 6 10 40.90372360779814738 40.48080 Arrival 24 15 4 5 6 10 40.90372360779814738 40.48080 Arrival 24 15 4 5 6 10 40.90372360779814738 40.48080 Arrival 24 15 4 5 6 10 40.208823529417646			Departure_Triage						
17 7.378566 Departure_Triage									
18 7.597774									_
19 7.741624									
20 7.952452 Treated_at_Hospital 8 10 4 5 1 2 21 8.405578 Treated_at_Hospital 3 9 4 4 1 3 22 8.689682 Departure_Triage 6 9 4 5 0 3 23 8.882615 Arrival 12 10 4 5 1 3 24 9.442854 Arrival 13 11 4 5 2 3 25 9.659940 Departure_Triage 0 11 4 5 1 3 26 9.708086 Arrival 14 12 4 5 2 3 27 9.806295 Arrival 15 13 4 5 3 3 28 10.295321 Departure_Triage 10 13 4 6 2 3 29 10.463054 Arrival 16 14 4 6 3 3 30 10.627081 Departure_Triage 10 13 4 6 2 3 31 10.641161 Departure_Triage 13 14 7 1 3 32 10.717027 Treated_at_Hospital 1 13 4 6 1 4 33 10.888673 Arrival 1 13 4 6 2 4 34 10.923696 Treated_at_Home 12 13 4 6 2 5 35 11.022091 Arrival 18 14 6 2 5 35 11.023091 Arrival 18 14 6 3 5 36 11.637037 Arrival 19 15 4 6 4 5 37 11.583799 Departure_Triage 15 15 4 7 3 5 38 12.033080 Treated_at_Hospital 2 14 4 6 3 6 39 12.574108 Departure_Triage 15 15 4 7 3 5 38 12.033080 Treated_at_Hospital 2 14 4 6 3 6 39 12.574208 Treated_at_Home 12 13 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 40 12.617399 Arrival 20 15 4 6 3 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 11 13 4 6 3 9 42 13.529301 Departure_Triage 14 14 4 7 2 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.046578 Treated_at_Hospital 1 13 4 6 3 9 46 14.983408 Arrival 21 15 4 7 3 7 47 15.18533 Arrival 21 15 4 7 3 7 48 13.856433 Arrival 21 15 4 7 3 7 49 15.657564 Arrival 21 15 4 7 3 7 40 13.856433 Arrival 21 15 4 7 3 7 41 15.8553 Arrival 21 15 4 7 3 7 42 13.529301 Departure_Triage 14 14 4 7 2 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.046578 Treated_at_Home 11 13 4 6 3 9 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 21 15 4 7 5 7 47 15.18553 Arrival 21 15 4 7 5 7 48 15.626411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 22 14 4 6 4 9 40 15.657564 Arrival 24 15 5 5 10 40 16.6582529417646									_
21 8.405578 Treated_at_Hospital 3 9 4 4 1 3 22 8.689682 Departure_Triage 6 9 4 5 0 3 23 8.882615 Arrival 12 10 4 5 1 3 24 9.442854 Arrival 13 11 4 5 2 3 25 9.659940 Departure_Triage 0 11 4 5 1 3 26 9.708086 Arrival 14 12 4 5 2 3 27 9.806295 Arrival 15 13 4 5 3 3 28 10.295321 Departure_Triage 10 13 4 6 2 3 29 10.463054 Arrival 16 14 4 6 3 3 30 10.627081 Departure_Triage 12 14 4 6 2 3 11 10.641161 Departure_Triage 12 14 4 6 2 3 11 0.641161 Departure_Triage 13 14 4 7 1 3 32 10.717027 Treated_at_Hospital 1 13 4 6 1 4 33 10.808573 Arrival 17 14 6 6 2 4 34 10.923696 Treated_at_Home 12 13 4 6 2 5 35 11.022091 Arrival 18 14 4 6 3 5 36 11.037037 Arrival 19 15 4 6 4 5 37 11.583799 Departure_Triage 15 15 4 7 3 5 38 12.033080 Treated_at_Hospital 2 14 4 6 2 6 40 12.617399 Departure_Triage 15 15 4 7 3 5 39 12.574108 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 6 42 13.529301 Departure_Triage 14 14 4 7 2 7 43 13.856433 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 11 13 4 6 2 6 46 14.983408 Arrival 20 15 4 6 3 6 47 15.185533 Arrival 20 15 4 6 3 9 48 15.620411 Treated_at_Hospital 3 14 4 6 3 9 46 14.983408 Arrival 22 14 4 6 4 9 47 15.185633 Arrival 22 15 4 6 6 9 48 15.620411 Treated_at_Hospital 3 14 4 6 3 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.65764 Arrival 22 15 4 6 6 9 40 16.6989297052222231 Joint 0.60372360779814738 Average number of people rejected due to bed unavailability 0.28 Average number of people rejected due to bed unavailability 0.28 Average number of people rejected due to bed unavailability 0.28 Average number of people rejected due to bed unavailability 0.38 Average number of pocupied beds 0.38037950462114783 Average number of potenter treated at home 0.20588235294117646 Average time a sick person gets better									_
22 8.689682 Departure_Triage 6 9 4 5 0 3 23 8.882615 Arrival 12 10 4 5 1 3 24 9.442854 Arrival 13 11 4 5 2 3 25 9.659940 Departure_Triage 0 11 4 5 1 3 26 9.708086 Arrival 15 13 4 5 2 3 27 9.806295 Arrival 15 13 4 5 3 3 28 10.295321 Departure_Triage 10 13 4 6 2 3 29 10.463054 Arrival 16 14 4 6 2 3 30 10.627081 Departure_Triage 12 14 4 6 2 3 31 10.641161 Departure_Triage 12 14 4 6 2 3 31 10.641161 Departure_Triage 13 14 4 7 1 3 32 10.717027 Treated_at_Hospital 1 13 4 6 1 4 33 10.880573 Arrival 17 14 4 6 2 4 34 10.923696 Treated_at_Home 12 13 4 6 2 5 35 11.022091 Arrival 18 14 6 3 5 36 11.037037 Arrival 19 15 4 6 4 5 37 11.583799 Departure_Triage 15 15 4 7 3 5 38 12.2574108 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 2 14 4 6 3 6 40 12.574308 Departure_Triage 11 14 4 6 2 6 40 12.333880 Treated_at_Hospital 2 14 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 11 14 4 6 3 7 42 13.529301 Departure_Triage 11 14 4 6 3 7 44 14.040578 Treated_at_Home 0 14 4 6 3 7 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 21 15 4 7 3 7 47 15.185533 Arrival 21 15 4 7 3 7 48 15.620411 Treated_at_Hospital 1 3 14 4 6 3 8 45 14.587924 Treated_at_Home 11 13 4 6 3 9 47 15.185533 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 22 15 4 5 5 10 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 22 15 4 5 5 10 49 15.657564 Arrival 22 15 4 5 5 10 49 15.657564 Arrival 24 15 4 5 5 10 40 19.1731284591583 Average number of people rejected due to bed unavailability 6.28 40 20588235294117646 Average number of occupied beds 6.38037950462114783 Average number of patients treated at home 6.20588235294117646 Average time a sick person gets better						4			
23 8.882615	22	8.689682		6	9	4	5	0	3
25 9.659940 Departure_Triage 0 11 4 5 1 3 26 9.7080806 Arrival 14 12 4 5 2 3 27 9.886295 Arrival 15 13 4 5 3 3 28 10.295321 Departure_Triage 10 13 4 6 2 3 29 10.463054 Arrival 16 14 4 6 3 3 30 10.627081 Departure_Triage 12 14 4 6 2 3 31 10.641161 Departure_Triage 13 14 4 7 1 3 32 10.717027 Treated_at_Hospital 1 13 4 6 1 4 34 10.923696 Treated_at_Home 12 13 4 6 2 4 34 10.923696 Treated_at_Home 12 13 4 6 2 5 35 11.022091 Arrival 18 14 4 6 3 5 37 11.583799 Departure_Triage 15 15 4 7 3 5 38 12.033080 Treated_at_Hospital 2 14 4 6 3 6 5 39 12.574108 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529361 Departure_Triage 11 14 4 6 2 6 40 14.040578 Treated_at_Home 0 14 4 6 3 7 41 13.856433 Arrival 21 15 4 7 3 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.040578 Treated_at_Home 11 13 4 6 6 3 9 46 14.983408 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.657564 Arrival 23 15 4 5 5 10 49 15.657564 Arrival 24 15 4 5 5 10 49 15.657564 Arrival 24 15 4 5 5 10 40 15.657564 Arrival 24 15 4 5 5 10 40 15.657564 Arrival 24 15 4 5 6 10 40 15.657564 Arrival 24 15 4 5 5 10 40 15.657564 Arrival 24 15 4 5 5 10 40 15.657564 Arrival 24 15 4 5 5 10 40 15.657564 Arrival 24 15 4 5 5 10 40 15.657564 Arrival 24 15 4 5 6 10 40 15.657564 Arrival 24 15 4 5 6 10 40 15.657564 Arrival 24 15 4 5 6 10 40 15.657564 Arrival 24 15 4 5 6 10 40 15.657564 Arrival 24 15 4 5 6 10 40 15.657564 Arrival 24 15 4 5 6 10 40 15.657564 Arrival 24 15 4 5 6 10 40 15.657564 Arrival 24 15 4 5 6 10 40 15.657564 Arrival 34 4 4 4 5 5 5 10 40 15.657564 Arrival 4 4 4 5 5 5 10 40 15.657564 Arrival 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	23	8.882615		12	10	4	5	1	3
26 9.708086		9.442854	Arrival	13	11	4			3
27 9.806295		9.659940	Departure_Triage	0		4			-
28 10.295321 Departure_Triage 10 13 4 6 2 3									-
29 10.463054									
30 10.627081 Departure_Triage 12 14 4 6 2 3 31 10.641161 Departure_Triage 13 14 4 7 1 3 32 10.717027 Treated_at_Hospital 1 13 4 6 1 4 33 10.880573 Arrival 17 14 4 6 2 4 34 10.923696 Treated_at_Home 12 13 4 6 2 5 35 11.022091 Arrival 18 14 4 6 3 5 36 11.037037 Arrival 19 15 4 6 4 5 37 11.583799 Departure_Triage 15 15 4 7 3 5 38 12.033080 Treated_at_Hospital 2 14 4 6 3 6 39 12.574108 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 11 14 4 6 3 7 42 13.529301 Departure_Triage 14 14 4 7 2 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.040578 Treated_at_Hospital 13 14 4 6 3 8 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.083408 Arrival 21 15 4 7 3 7 47 15.185533 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 40 10.09_run probability of arriving patient finds an available bed 0.6989297052222231 Joint 0.66372360779814738 Average number of people rejected due to bed unavailability 0.28 Average number of occupied beds 0.38037950462114783 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better	_								-
31 10.641161 Departure_Triage 13 14 4 7 1 3 3 2 10.717027 Treated_at_Hospital 1 13 4 6 1 4 4 3 10.880573 Arrival 17 14 4 6 2 4 4 4 6 1.923696 Treated_at_Home 12 13 4 6 2 5 5 5 11.022091 Arrival 18 14 4 6 3 5 11.037037 Arrival 19 15 4 6 4 5 3 11.583799 Departure_Triage 15 15 4 7 3 5 3 11.583799 Departure_Triage 15 15 4 7 3 5 3 12.574108 Departure_Triage 11 14 4 6 2 6 4 12.617399 Arrival 20 15 4 6 3 6 4 12.617399 Arrival 20 15 4 6 3 6 4 12.617399 Arrival 20 15 4 6 3 7 4 13.529301 Departure_Triage 11 14 4 7 2 7 7 4 13.529301 Departure_Triage 14 14 7 2 7 7 4 13.529301 Departure_Triage 14 14 4 7 2 7 7 4 13.529301 Departure_Triage 14 14 4 7 2 7 7 4 14.040578 Treated_at_Hospital 13 14 4 6 3 8 14.547924 Treated_at_Home 11 13 4 6 3 9 4 14.547924 Treated_at_Home 11 13 4 6 3 9 4 14.547924 Treated_at_Home 11 13 4 6 5 9 9 15.657564 Arrival 22 14 4 6 4 9 9 15.657564 Arrival 23 15 4 6 5 9 9 16.657564 Arrival 24 15 4 5 6 10 16 16 16 16 16 16 16 16 16 16 16 16 16									
32 10.717027 Treated_at_Hospital 1 13 4 6 1 4 33 10.886573 Arrival 17 14 4 6 2 4 34 10.923696 Treated_at_Home 12 13 4 6 2 5 35 11.022091 Arrival 18 14 4 6 3 5 36 11.037037 Arrival 19 15 4 6 4 5 37 11.583799 Departure_Triage 15 15 4 7 3 5 38 12.033080 Treated_at_Hospital 2 14 4 6 3 6 39 12.574108 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 14 14 4 7 2 7 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.040578 Treated_at_Hospital 13 14 4 6 3 8 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 22 14 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average number of patients treated at home 0.20588235294117646 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
33 10.880573									~
34 10.923696 Treated_at_Home 12 13 4 6 2 5 35 11.022091 Arrival 18 14 4 6 3 5 36 11.037037 Arrival 19 15 4 6 4 5 37 11.583799 Departure_Triage 15 15 4 7 3 5 38 12.033080 Treated_at_Hospital 2 14 4 6 3 6 39 12.574108 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 14 14 4 7 2 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.040578 Treated_at_Hospital 13 14 6 3 8 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
35 11.022091									
36 11.037037									
38 12.033080 Treated_at_Hospital 2 14 4 6 3 6 39 12.574108 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 14 14 4 7 2 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.040578 Treated_at_Hospital 13 14 4 6 3 8 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 22 14 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better						4			
39 12.574108 Departure_Triage 11 14 4 6 2 6 40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 14 14 4 7 2 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.040578 Treated_at_Hospital 13 14 4 6 3 8 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 22 14 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better	37	11.583799	Departure_Triage	15	15	4	7	3	5
40 12.617399 Arrival 20 15 4 6 3 6 41 12.732358 Treated_at_Home 0 14 4 6 3 7 42 13.529301 Departure_Triage 14 14 4 7 2 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.040578 Treated_at_Hospital 13 14 4 6 3 8 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better	38	12.033080	Treated_at_Hospital	2	14	4	6		6
41 12.732358	-		Departure_Triage						*
42 13.529301 Departure_Triage 14 14 4 7 2 7 43 13.856433 Arrival 21 15 4 7 3 7 44 14.040578 Treated_at_Hospital 13 14 4 6 3 8 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
43 13.856433									
44 14.040578 Treated_at_Hospital 13 14 4 6 3 8 45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
45 14.547924 Treated_at_Home 11 13 4 6 3 9 46 14.983408 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
46 14.983408 Arrival 22 14 4 6 4 9 47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									-
47 15.185533 Arrival 23 15 4 6 5 9 48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									-
48 15.620411 Treated_at_Hospital 4 14 4 5 5 10 49 15.657564 Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
Arrival 24 15 4 5 6 10 Long-run probability of arriving patient finds an available nurse 0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									-
0.0911731284591583 Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better				24	15	4	5	6	
Long-run probability of critical patient finds an available bed 0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better	Lon	g-run proba	bility of arriving pa	tient finds	an a	vail	able	nurs	e
0.6989297052222231 Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
Joint 0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better				tient finds	an a	vail	able	bed	
0.06372360779814738 Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better			2231						
Average number of people rejected due to bed unavailability 0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better			4.700						
0.28 Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better						1-63	7 d 4		
Average utilization of each nurse 0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better			or beoble rejected a	ue to bea ur	1ava1	тарі	тіту		
0.890229978433669 Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better			ation of each nurse						
Average number of occupied beds 0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
0.38037950462114783 Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
Average number of patients treated at home 0.20588235294117646 Average time a sick person gets better									
0.20588235294117646 Average time a sick person gets better				at home					
8.883932320323943				ter					
	8.8	83932320323	943						

-System: "Empty", Number of Healed Patients: "200"

	Time	Event Type	Patient ID	L	Lt	Lb	Lq	Healed
0	0.000000	Arrival	0	1	1	0	0	0
1	0.209147	Arrival	1	2	2	0	0	0
2	0.489128	Arrival	2	3	3	0	0	0
3	0.835985	Arrival	3	4	4	0	0	0
	1.056642	Arrival	4	5	4	0	1	o O
4 5	1.901995	Arrival	5	6	4	0	2	ø
6	2.778639	Departure_Triage	2	6	4	1	1	ø
7	3.149562	Arrival	6	7	4	1	2	ø
8			1	7	4	2	1	
	3.214863	Departure_Triage						0
9	3.821903	Departure_Triage	5	7	4	3	0	0
10	4.420480	Arrival	7	8	4	3	1	0
11	4.425407	Arrival	8	9	4	3	2	0
12	4.848247	Treated_at_Hospital	5	8	4	2	2	1
13	5.611839	Arrival	9	9	4	2	3	1
14	6.777256	Departure_Triage	4	9	4	3	2	1
15	6.868155	Departure_Triage	7	9	4	4	1	1
16	7.044708	Departure_Triage	8	9	4	5	0	1
17	7.378566	Departure_Triage	3	9	3	6	0	1
18	7.597774	Arrival	10	10	4	6	0	1
19	7.741624	Arrival	11	11	4	6	1	1
20	7.952452	Treated_at_Hospital	8	10	4	5	1	2
21	8.405578	Treated_at_Hospital	3	9	4	4	1	3
22	8.689682	Departure_Triage	6	9	4	5	0	3
23	8.882615	Arrival	12	10	4	5	1	3
24	9.442854	Arrival	13	11	4	5	2	3
25			0		4	5	1	
	9.659940	Departure_Triage		11				3
26	9.708086	Arrival	14	12	4	5	2	3
27	9.806295	Arrival	15	13	4	5	3	3
28	10.295321	Departure_Triage	10	13	4	6	2	3
29	10.463054	Arrival	16	14	4	6	3	3
30	10.627081	Departure_Triage	12	14	4	6	2	3
31	10.641161	Departure_Triage	13	14	4	7	1	3
32	10.717027	Treated_at_Hospital	1	13	4	6	1	4
33	10.880573	Arrival	17	14	4	6	2	4
34	10.923696	Treated_at_Home	12	13	4	6	2	5
35	11.022091	Arrival	18	14	4	6	3	5
36	11.037037	Arrival	19	15	4	6	4	5
37	11.583799	Departure_Triage	15	15	4	7	3	5
38	12.033080	Treated_at_Hospital	2	14	4	6	3	6
39	12.574108	Departure_Triage	11	14	4	6	2	6
40	12.617399			15	4	6	3	
		Arrival	20		4		3	6
41	12.732358	Treated_at_Home	0	14		6		7
42	13.529301	Departure_Triage	14	14	4	7	2	7
43	13.856433	Arrival	21	15	4	7	3	7
44	14.040578	Treated_at_Hospital	13	14	4	6	3	8
45	14.547924	Treated_at_Home	11	13	4	6	3	9
46		Arrival	22	14	4	6	4	9
	15.185533	Arrival	23	15	4	6	5	9
48	15.620411	Treated_at_Hospital	4	14	4	5	5	10
49		Arrival	24	15	4	5	6	10
Lon	g-run proba	bility of arriving pa	tient finds	an a	vail	able	nurs	se
	60681747080							
		bility of critical pa	tient finds	an a	vail	able	bed	
	72172075443							
Joi								
	78508373217	80403						
		of people rejected d	ue to bed us	avai	labi	lity		
	11age number 159036144578		ue co beu ur	ra v a 1	Tanı	ттсу		
		ation of each nurse						
	03350738029							
		of occupied beds						
	96938582935							
		of patients treated	at home					
	73271889400							
		sick person gets bet	ter					
11.	07520075309	689						

-System: "Empty", Number of Healed Patients: "1000"

```
Event Type
                                       Patient ID
                                                        Lt
                                                             Lb
                                                                 Lq
                                                                     Healed
0
     0.000000
                             Arrival
                                                     1
                                                                           a
                                                0
                                                         1
                                                             0
                                                                  0
1
                                                     2
     0.209147
                             Arrival
                                                1
                                                         2
                                                              0
                                                                  0
                                                                           0
2
     0.489128
                             Arrival
                                                2
                                                     3
                                                              0
                                                                  0
                                                                           0
3
                                                     4
                                                3
                                                         4
                                                              0
                                                                  0
                                                                           0
     0.835985
                             Arrival
4
                             Arrival
                                                     5
                                                              0
     1.056642
                                                         4
                                                                           a
                                                4
5
                                                     6
                                                              0
     1.901995
                             Arrival
                                                5
                                                         4
                                                                  2
                                                                           0
6
                   Departure_Triage
     2.778639
                                                2
                                                     6
                                                              1
                                                                  1
                                                                           0
                                                6
                                                              1
     3.149562
                             Arrival
                                                         4
                                                                  2
                                                                           0
8
     3.214863
                   Departure_Triage
                                                1
                                                         4
                                                              2
                                                                  1
                                                                           0
                                                     7
     3.821903
                   Departure_Triage
                                                5
                                                             3
                                                                  0
                                                                           0
10
     4.420480
                             Arrival
                                                7
                                                     8
                                                             3
                                                                  1
                                                                           0
                                                     9
11
                                                8
                                                         4
     4.425407
                             Arrival
                                                              3
                                                                  2
                                                                           0
12
                                                5
                                                     8
     4.848247
                Treated_at_Hospital
                                                         4
                                                              2
                                                                  2
                                                                           1
13
     5.611839
                                                9
                                                     9
                                                         4
                                                              2
                                                                  3
                                                                           1
                             Arrival
                   Departure_Triage
Departure_Triage
Departure_Triage
14
                                                     9
                                                4
                                                              3
                                                                  2
                                                                           1
     6.777256
15
                                                     9
                                                7
                                                                  1
                                                                           1
     6.868155
                                                         4
                                                              4
                                                     9
16
     7.044708
                                                8
                                                         4
                                                             5
                                                                  0
                                                                           1
17
     7.378566
                   Departure_Triage
                                                3
                                                         3
                                                             6
                                                                  0
                                                                           1
18
     7.597774
                             Arrival
                                               10
                                                    10
                                                                  0
                                                                           1
                                                    11
19
     7.741624
                             Arrival
                                               11
                                                         4
                                                              6
                                                                  1
                                                                           1
20
                                                8
                                                    10
                                                              5
                                                                  1
                                                                           2
     7.952452
               Treated_at_Hospital
                                                         4
21
                                                     9
                                                                           3
     8.405578
                Treated_at_Hospital
                                                3
                                                         4
                                                              4
                                                                  1
22
     8.689682
                   Departure_Triage
                                                6
                                                    9
                                                         4
                                                              5
                                                                  0
                                                                           3
23
     8.882615
                                               12
                                                    10
                             Arrival
                                                         4
                                                              5
                                                                  1
                                                                           3
24
     9.442854
                             Arrival
                                               13
                                                   11
                                                              5
                                                                  2
                                                                           3
                                                         4
25
     9.659940
                   Departure_Triage
                                                0
                                                    11
                                                             5
                                                                  1
                                                                           3
26
     9.708086
                             Arrival
                                               14
                                                    12
                                                              5
                                                                  2
                                                                           3
                                               15
                                                   13
                                                         4
                                                              5
                                                                  3
27
     9.806295
                             Arrival
                                                                           3
28
                                               10
                                                    13
   10.295321
                   Departure_Triage
                                                         4
                                                              6
                                                                  2
                                                                           3
29
                                                    14
                                                         4
    10.463054
                             Arrival
                                               16
                                                              6
                                                                  3
                                                                           3
                   Departure_Triage
Departure_Triage
    10.627081
                                               12
                                                    14
                                                              6
                                                                  2
                                                                           3
                                               13 14
31
    10.641161
                                                         4
                                                              7
                                                                  1
                                                                           3
32
    10.717027
                Treated_at_Hospital
                                                1 13
                                                                  1
                                                         4
                                                              6
                                                                           4
                                                                           4
33
    10.880573
                             Arrival
                                               17
                                                    14
                                                             6
                                                                  2
                                                                           5
    10.923696
                    Treated_at_Home
                                               12 13
                                                                  2
35
                             Arrival
                                               18
                                                   14
                                                         4
                                                              6
                                                                  3
                                                                           5
   11.022091
                             Arrival
                                               19
                                                    15
                                                         4
                                                                           5
36
   11.037037
                                                              6
                                                                  4
                                                    15
                                                         4
37
    11.583799
                   Departure_Triage
                                               15
                                                              7
                                                                  3
                                                                           5
    12.033080
                Treated_at_Hospital
                                                2
                                                    14
                                                         4
                                                              6
                                                                  3
                                                                           6
                                               11
39
                                                    14
    12.574108
                   Departure_Triage
                                                         4
                                                              6
                                                                  2
                                                                           6
                                               20
40
   12.617399
                             Arrival
                                                   15
                                                         4
                                                                  3
                                                              6
                                                                           6
41
   12.732358
                    Treated_at_Home
                                                0
                                                   14
                                                              6
                                                                  3
                                                                           7
   13.529301
                   Departure_Triage
                                               14
                                                   14
                                                              7
                                                                  2
                                               21 15
43
                                                         4
                                                                  3
                                                                           7
   13.856433
                             Arrival
                                               13
                                                    14
                                                                           8
44
   14.040578
                Treated_at_Hospital
                                                         4
                                                              6
                                                                  3
                                                    13
                                                                           9
45
    14.547924
                    Treated_at_Home
                                               11
                                                             6
                                                                  3
46
    14.983408
                             Arrival
                                               22
                                                    14
                                                              6
                                                                           9
    15.185533
                             Arrival
                                               23
                                                   15
                                                         4
                                                              6
                                                                  5
                                                                          9
   15.620411 Treated_at_Hospital
48
                                                    14
                                                         4
                                                              5
                                                                  5
                                                4
                                                                          10
   15.657564
                             Arrival
                                               24
                                                   15
                                                              5
                                                                  6
                                                                          10
Long-run probability of arriving patient finds an available nurse
0.5787447055646788
Long-run probability of critical patient finds an available bed
0.8287317736747841
Joint
0.479624126347507
Average number of people rejected due to bed unavailability
0.17632552404438964
Average utilization of each nurse
0.703812099072887
Average number of occupied beds
0.6978700953888646
Average number of patients treated at home
0.3323353293413174
Average time a sick person gets better
11.00051244527104
```

-System: "All nurses and beds full", Number of Healed Patients: "20"

		,					,		
	Time	Event Type	Patient :		L	Lt	Lb		Healed
0	0.000000	Arrival		11	12	4	7	1	0
1	0.585610	Departure_Triage		1	12	4	7	0	0
2	0.783949	Departure_Triage		3	12	3	7	0	0
3	1.428077	Arrival		12	13	4	7	0	0
4 5	1.544601	Treated_at_Hospital		7	12	4	6	0	1
5 6	1.838615 1.873105	Departure_Triage		12 12	12 11	3 3	7 6	0 0	1 2
o 7	2.427993	Treated_at_Hospital Treated_at_Hospital		12 5	10	3	o 5	0	3
8	2.976415	Treated_at_Home		3	9	3	5	0	4
9	3.005717	Departure_Triage		2	9	2	6	0	4
10	3.166570	Arrival		13	10	3	6	0	4
11	3.586476	Departure_Triage		11	10	2	7	0	4
12	3.813724	Treated_at_Hospital		11	9	2	6	ø	5
13	4.429878	Arrival		14	10	3	6	ø	5
14	4.492932	Arrival	:	15	11	4	6	0	5
15	4.856030	Departure_Triage	:	15	11	3	7	0	5
16	5.723777	Treated_at_Hospital		4	10	3	6	0	6
17	5.883042	Treated_at_Hospital	:	15	9	3	5	0	7
18	5.917470	Treated_at_Hospital		8	8	3	4	0	8
19	8.727188	Departure_Triage	:	13	8	2	4	0	8
20	8.732975	Treated_at_Hospital		9	7	2	3	0	9
21	9.254441	Treated_at_Hospital	:	10	6	2	2	0	10
22	9.659940	Departure_Triage		0	6	1	3	0	10
23	9.784093	Arrival	:	16	7	2	3	0	10
24	10.666887	Treated_at_Hospital		0	6	2	2	0	11
25	11.310741	Treated_at_Hospital		2	5	2	1	0	12
26	11.637252	Departure_Triage		14	5	1	1	0	12
27 28	12.978867	Departure_Triage		16 1	5 4	0 0	2 2	0 0	12 13
28 29	13.205902 13.341233	Treated_at_Home Arrival		17	4 5	1	2	0	13 13
30	13.832819	Arrival		17 18	6	2	2	0	13
31	13.931029	Arrival		19	7	3	2	0	13
32	14.083883	Departure_Triage		17	7	2	3	0	13
33	14.748499	Treated_at_Home		13	6	2	3	0	14
34	14.799960	Departure_Triage		18	6	1	3	0	14
35	14.948482	Treated_at_Hospital	:	17	5	1	2	0	15
36	15.130955	Arrival	:	20	6	2	2	0	15
37	15.263839	Departure_Triage	:	20	6	1	3	0	15
38	15.769953	Departure_Triage	:	19	6	0	3	0	15
39	16.167462	Arrival		21	7	1	3	0	15
40	16.182408	Arrival		22	8	2	3	0	15
41	16.356454	Treated_at_Hospital		6	7	2	2	0	16
42	16.563714	Departure_Triage		21	7	1	3	0	16
43	16.900539	Treated_at_Hospital		16	6	1	2	0	17
	17.409452			18	5	1	2	0	18
45 46	17.874056	Treated_at_Home Treated_at_Hospital		19 20	4 3	1 1	2 1	0 0	19 20
		bility of arriving pa							
	g-run proba 16542730314		creut itin	us	all a	vатт	апте	Hurs	e
-		bility of critical pa	tient fin	de	an a	vail	ahle	hed	
	g-run proba 56719225638		CIONC TIN	u S	an a	Vall	авте	beu	
Joi		2400							
	 85219778179	756							
		of people rejected d	ue to bed	ur	navai	labi	lity		
0.1	81818181818	18182							
Ave	rage utiliz	ation of each nurse							
0.5	07016776303	2367							
		of occupied beds							
	26199083328								
		of patients treated	at home						
	16666666666								
		sick person gets bet	ter						
4.1	11827429755	338							

-System: "All nurses and beds full", Number of Healed Patients: "200"

	Timo	Event Tune	Dotiont ID		1.4	1 6	La	Heeled
0	Time 0.000000	Event Type Arrival	Patient ID 11	L 12	Lt 4	Lb 7	Lq 1	Healed 0
1	0.585610	Departure_Triage	1	12	4	7	0	0
2	0.783949	Departure_Triage	3	12	3	7	0	ø
3	1.428077	Arrival	12	13	4	7	0	0
	1.544601	Treated_at_Hospital	7	12	4	6	0	1
4 5	1.838615	Departure_Triage	12	12	3	7	0	1
6	1.873105	Treated_at_Hospital	12	11	3	6	0	2
7	2.427993	Treated_at_Hospital	5	10	3	5	0	3
8	2.976415	Treated_at_Home	3	9	3	5	0	4
9	3.005717	Departure_Triage	2	9	2	6	0	4
10	3.166570	Arrival	13	10	3	6	0	4
11	3.586476	Departure_Triage	11	10	2 2	7	0	4
12 13	3.813724 4.429878	Treated_at_Hospital Arrival	11 14	9 10	3	6 6	0 0	5 5
13 14	4.429878	Arrival	15	11	3 4	6	0	5
15	4.856030	Departure_Triage	15	11	3	7	0	5
16	5.723777	Treated_at_Hospital	4	10	3	6	0	6
17	5.883042	Treated_at_Hospital	15	9	3	5	0	7
18	5.917470	Treated_at_Hospital	8	8	3	4	0	8
19	8.727188	Departure_Triage	13	8	2	4	0	8
20	8.732975	Treated_at_Hospital	9	7	2	3	0	9
21	9.254441	Treated_at_Hospital	10	6	2	2	0	10
22	9.659940	Departure_Triage	0	6	1	3	0	10
23	9.784093	Arrival	16	7	2	3	0	10
	10.666887	Treated_at_Hospital	0	6	2	2	0	11
	11.310741	Treated_at_Hospital	2	5	2	1	0	12
	11.637252	Departure_Triage	14	5	1	1	0	12
	12.978867 13.205902	Departure_Triage	16 1	5 4	0 0	2 2	0 0	12 13
	13.341233	Treated_at_Home Arrival	17	5	1	2	0	13
	13.832819	Arrival	18	6	2	2	0	13
	13.931029	Arrival	19	7	3	2	ø	13
	14.083883	Departure_Triage	17	7	2	3	0	13
	14.748499	Treated_at_Home	13	6	2	3	0	14
34	14.799960	Departure_Triage	18	6	1	3	0	14
35	14.948482	Treated_at_Hospital	17	5	1	2	0	15
36	15.130955	Arrival	20	6	2	2	0	15
	15.263839	Departure_Triage	20	6	1	3	0	15
	15.769953	Departure_Triage	19	6	0	3	0	15
	16.167462	Arrival	21	7	1	3	0	15
	16.182408	Arrival	22	8 7	2 2	3 2	0 0	15
	16.356454 16.563714	Treated_at_Hospital Departure_Triage	6 21	7	1	3	0	16 16
	16.900539	Treated_at_Hospital	16	6	1	2	0	10 17
	17.409452	Treated_at_Home			1			18
45	17.874056	Treated_at_Home	19	4	1			19
		Treated_at_Hospital	20		1			20
47	19.548825	Arrival	23		2			20
	20.307847		14	3	2	1	0	21
	20.433095		23		1	2	0	21
		bility of arriving pa	tient finds	an a	vail	able	nur	se
	0115797672							
		bility of critical pa	tient finds	an a	vail	able	bed	
	3191765452	4394						
Join		0272						
	'5015787974 'age number	9272 of people rejected d	ue to bed w	navai	labi	lity		
	0493827160		ue to bed di	ıavaı	тарт	ттсу		
		ation of each nurse						
0.70	3135755078	6013						
		of occupied beds						
	2933052632							
		of patients treated	at home					
0.30	6930693069	3069						
		sick person gets bet	ter					
10.4	6513422052	5105						

-System: "All nurses and beds full", Number of Healed Patients: "1000"

_	Time	Event Type	Patient ID	L	Lt	Lb		Healed
0 1	0.000000 0.585610	Arrival	11 1	12 12	4 4	7 7	1	0 0
	0.585610	Departure_Triage	3	12	3	7	0 0	0
2 3	1.428077	Departure_Triage Arrival	12	13	3 4	7	0	0
4	1.544601	Treated_at_Hospital	7	12	4	6	0	1
5	1.838615	Departure_Triage	12	12	3	7	0	1
6	1.873105	Treated_at_Hospital	12	11	3	6	0	2
7	2.427993	Treated_at_Hospital	5	10	3	5	ø	3
8	2.976415	Treated_at_Home	3	9	3	5	0	4
9	3.005717	Departure_Triage	2	9	2	6	0	4
10	3.166570	Arrival	13	10	3	6	0	4
11	3.586476	Departure_Triage	11	10	2	7	0	4
12	3.813724	Treated_at_Hospital	11	9	2	6	0	5
13	4.429878	Arrival	14	10	3	6	0	5
14	4.492932	Arrival	15	11	4	6	0	5
15	4.856030	Departure_Triage	15	11	3	7	0	5
16	5.723777	Treated_at_Hospital	4	10	3	6	0	6
17	5.883042	Treated_at_Hospital	15	9	3	5	0	7
18	5.917470	Treated_at_Hospital	8	8	3	4	0	8
19	8.727188	Departure_Triage	13	8	2	4	0	8
20	8.732975	Treated_at_Hospital	9	7	2	3	0	9
21	9.254441 9.659940	Treated_at_Hospital	10	6	2 1	2	0	10
22		Departure_Triage Arrival	0 16	6 7	2	3 3	0 0	10 10
23 24	9.784093 10.666887	Treated_at_Hospital	0	6	2	2	0	11
25	11.310741	Treated_at_Hospital	2	5	2	1	0	12
26	11.637252	Departure_Triage	14	5	1	1	0	12
27	12.978867	Departure_Triage	16	5	ō	2	0	12
28	13.205902	Treated_at_Home	1	4	0	2	0	13
29	13.341233	Arrival	17	5	1	2	ø	13
30	13.832819	Arrival	18	6	2	2	0	13
31	13.931029	Arrival	19	7	3	2	0	13
32	14.083883	Departure_Triage	17	7	2	3	0	13
33	14.748499	Treated_at_Home	13	6	2	3	0	14
34	14.799960	Departure_Triage	18	6	1	3	0	14
35	14.948482	Treated_at_Hospital	17	5	1	2	0	15
36	15.130955	Arrival	20	6	2	2	0	15
37	15.263839	Departure_Triage	20	6	1	3	0	15
38	15.769953	Departure_Triage	19	6	0	3	0	15
39	16.167462	Arrival	21	7	1	3	0	15
40 41	16.182408	Arrival	22	8 7	2 2	3 2	0	15
41 42	16.356454 16.563714	Treated_at_Hospital Departure_Triage	6 21	7	1	3	0 0	16 16
43	16.900539	Treated_at_Hospital	16	6	1	2	0	17
44	17.409452	Treated_at_Home	18	5	1	2	0	18
	17.874056		19	4	1	2	0	19
		Treated_at_Hospital	20	3	1	1	0	20
47		Arrival	23	4	2	1	0	20
48	20.307847	Treated_at_Home	14	3	2	1	0	21
49		Departure_Triage	23	3	1	2	0	21
		bility of arriving pa	tient finds	an a	vail	able	nurs	e
	16023714068							
	•	bility of critical pa	tient finds	an a	vail	able	bed	
	43795666330	8789						
Joi		2222						
	19798140288		110 +0 bod		l abi	1:+		
	rage number 45161290322	of people rejected d	ue to bed un	iavaı	тарт.	ттту		
		ation of each nurse						
	85242591894							
		of occupied beds						
	97288007348							
		of patients treated	at home					
	08157099697							
		sick person gets bet	ter					
	92022263355							

-System: "Half of the nurses and half of the beds full", Number of Healed Patients: "20"

	Timo	Front Tune	Dotiont ID		1.4	l b	1 ~	lloo lod
0	Time 0.000000	Event Type Arrival	Patient ID 5	L 6	Lt 3	Lb 3	Lq 0	Healed 0
1	0.585610	Departure_Triage	1	6	2	4	0	ø
2	0.971197	Departure_Triage	5	6	1	5	0	0
3	1.959873	Treated_at_Hospital	3	5	1	4	0	1
4	2.130211	Treated_at_Hospital	1	4	1	3	0	2
5 6	2.336636	Arrival	6	5	2	3	0	2
	3.658699	Arrival	7	6	3	3	0	2
7	4.929617	Arrival	8	7	4	3	0	2
8 9	5.146417 5.293037	Arrival Arrival	9 10	8 9	4 4	3 3	1 2	2 2
10	5.723777	Treated_at_Hospital	4	8	4	2	2	3
11	5.829826	Departure_Triage	6	8	4	3	1	3
12	5.864316	Treated_at_Hospital	6	7	4	2	1	4
13	6.888667	Treated_at_Hospital	5	6	4	1	1	5
14	7.031530	Arrival	11	7	4	1	2	5
15	7.514292	Treated_at_Hospital	2	6	4	0	2	6
16	7.657316	Departure_Triage	7	6	4	1	1	6
17	7.748215	Departure_Triage	10	6	4	2	0	6
18	7.924768	Departure_Triage	11	6	3	3	0	6
19	7.930482	Departure_Triage	8	6	2 2	4	0	6 7
20 21	8.832512 9.017465	Treated_at_Hospital Arrival	11 12	5 6	3	3 3	0 0	7
22	9.151836	Departure_Triage	9	6	2	4	0	7
23	9.428269	Departure_Triage	12	6	1	4	0	7
24	9.659940	Departure_Triage	0	6	0	5	0	7
25	9.980874	Arrival	13	7	1	5	0	7
26	10.158784	Treated_at_Hospital	9	6	1	4	0	8
27	10.541113	Arrival	14	7	2	4	0	8
28	11.032700	Arrival	15	8	3	4	0	8
29	11.130910	Arrival	16	9	4	4	0	8
30 31	11.283764 11.999841	Departure_Triage	14 15	9 9	3 2	4 5	0 0	8 8
32	12.055727	Departure_Triage Treated_at_Home	15	8	2	ວ 5	0	9
33	12.330836	Arrival	17	9	3	5	0	9
34	12.463720	Departure_Triage	17	9	2	6	0	9
35	12.969834	Departure_Triage	16	9	1	6	0	9
36	13.367343	Arrival	18	10	2	6	0	9
37	13.382288	Arrival	19	11	3	6	0	9
38	13.763595	Departure_Triage	18	11	2	7	0	9
39	13.865301	Departure_Triage	13	11	1	7	0	9
40 41	14.922472 15.073937	Treated_at_Hospital	15 16	10 9	1 1	6 6	0 0	10 11
42	15.839116	Treated_at_Home Treated_at_Home	13	8	1	6	0	12
43	15.863137	Treated_at_Hospital	17	7	1	5	0	13
44	16.500471	Treated_at_Hospital	7	6	1	4	ø	14
45	16.559463	Treated_at_Home	12	5	1	4	0	15
46	16.748706	Arrival	20	6	2	4	0	15
47		Departure_Triage	19		1		0	15
48	17.987740	Arrival	21		2	5	0	15
49		Arrival bility of arriving pa	22		3	5 - 5 1 -	0	15
	g-run proba 43122527821		tient linds	an a	vатт	арте	nurs	se
		bility of critical pa	tient finds	an a	vail	ah]e	hed	
	96576482572		cione rinas	uii u	vull	ubic	bea	
Joi	nt							
	91953929332	6513						
		of people rejected d	ue to bed ur	navai	labi	lity		
	42857142857							
		ation of each nurse						
	27777781149							
	rage number 33810296951	of occupied beds						
		of patients treated	at home					
	222222222222		a c Home					
		sick person gets bet	ter					
	08780807872							
			_					

-System: "Half of the nurses and half of the beds full", Number of Healed Patients: "200"

Time	Front Type	Detient ID		1.4	l b	l «	Uaalad
0 0.000000	Event Type Arrival	Patient ID 5	L 6	Lt 3	Lb 3	Lq 0	Healed 0
1 0.585610	Departure_Triage	1	6	2	4	0	0
2 0.971197	Departure_Triage	5	6	1	5	0	ø
3 1.959873	Treated_at_Hospital	3	5	1	4	0	1
	Treated_at_Hospital	1	4	1	3	0	2
4 2.130211 5 2.336636	Arrival	6	5	2	3	0	2
6 3.658699	Arrival	7	6	3	3	0	2
7 4.929617	Arrival	8	7	4	3	0	2
8 5.146417	Arrival	9	8	4	3	1	2
9 5.293037	Arrival	10	9	4	3	2	2
10 5.723777	Treated_at_Hospital	4	8	4	2	2	3
11 5.829826 12 5.864316	Departure_Triage Treated_at_Hospital	6	8 7	4 4	3 2	1 1	3 4
13 6.888667	Treated_at_Hospital	5	6	4	1	1	5
14 7.031530	Arrival	11	7	4	1	2	5
15 7.514292	Treated_at_Hospital	2	6	4	ø	2	6
16 7.657316	Departure_Triage	7	6	4	1	1	6
17 7.748215	Departure_Triage	10	6	4	2	0	6
18 7.924768	Departure_Triage	11	6	3	3	0	6
19 7.930482	Departure_Triage	8	6	2	4	0	6
20 8.832512	Treated_at_Hospital	11	5	2	3	0	7
21 9.017465	Arrival	12	6	3	3	0	7
22 9.151836	Departure_Triage	9	6	2	4	0	7
23 9.428269	Departure_Triage	12	6	1	4	0	7
24 9.659940	Departure_Triage	0	6	0	5	0	7 7
25 9.980874 26 10.158784	Arrival Treated_at_Hospital	13 9	7 6	1 1	5 4	0 0	<i>/</i> 8
27 10.541113	Arrival	14	o 7	2	4	0	8 8
28 11.032700	Arrival	15	8	3	4	0	8
29 11.130910	Arrival	16	9	4	4	0	8
30 11.283764	Departure_Triage	14	9	3	4	0	8
31 11.999841	Departure_Triage	15	9	2	5	0	8
32 12.055727	Treated_at_Home	14	8	2	5	0	9
33 12.330836	 Arrival	17	9	3	5	0	9
34 12.463720	Departure_Triage	17	9	2	6	0	9
35 12.969834	Departure_Triage	16	9	1	6	0	9
36 13.367343	Arrival	18	10	2	6	0	9
37 13.382288	Arrival	19	11	3	6	0	9
38 13.763595	Departure_Triage	18	11	2	7	0	9
39 13.865301 40 14.922472	Departure_Triage	13 15	11 10	1 1	7 6	0 0	9 10
41 15.073937	Treated_at_Hospital Treated_at_Home	16	9 10	1	6	0	11
42 15.839116	Treated_at_Home	13	8	1	6	0	12
43 15.863137	Treated_at_Hospital	17	7	1	5	0	13
44 16.500471	Treated_at_Hospital	7	6	1	4	0	14
45 16.559463	Treated_at_Home	12	5	1	4	0	15
46 16.748706	Arrival	20	6	2	4	0	15
47 17.807303		19	6	1		0	15
48 17.987740	Arrival	21	7	2	5	0	15
49 19.114715	Arrival		8	3	5	0	15
	bility of arriving pa	tient finds	an a	vail	able	nurs	е
0.557653174054		eione Eindo			- h] -	اممط	
0.900184583009	bility of critical pa	tient finds	an a	valı	арте	bea	
Joint	7/231						
0.501990789949	99253						
	of people rejected d	ue to bed ur	navai	labi	litv		
0.075					,		
Average utiliz 0.705920931149	ration of each nurse 93215						
	of occupied beds						
0.593228472318							
0.264705882352							
	a sick person gets bet	ter					
7170700700042		_					

-System: "Half of the nurses and half of the beds full", Number of Healed Patients: "1000"

	Time	Event Type	Patient ID	L	Lt	Lb	Lq	Healed
0	0.000000	Arrival	5	6	3	3	-9	0
1	0.585610	Departure_Triage	1	6	2	4	0	0
2	0.971197	Departure_Triage	5	6	1	5	0	0
3 4	1.959873 2.130211	Treated_at_Hospital Treated_at_Hospital	3 1	5 4	1 1	4 3	0 0	1 2
5	2.336636	Arrival	6	5	2	3	0	2
6	3.658699	Arrival	7	6	3	3	0	2
7	4.929617	Arrival	8	7	4	3	0	2
8	5.146417	Arrival	9	8	4	3	1	2
9	5.293037	Arrival	10	9	4	3	2	2
10 11	5.723777	Treated_at_Hospital	4	8 8	4 4	2 3	2 1	3 3
12	5.829826 5.864316	Departure_Triage Treated_at_Hospital	6	o 7	4	3 2	1	4
13	6.888667	Treated_at_Hospital	5	6	4	1	1	5
14	7.031530	Arrival	11	7	4	1	2	5
15	7.514292	Treated_at_Hospital	2	6	4	0	2	6
16	7.657316	Departure_Triage	7	6	4	1	1	6
17	7.748215	Departure_Triage	10	6	4	2	0	6
18	7.924768	Departure_Triage	11	6	3	3	0	6
19 20	7.930482 8.832512	Departure_Triage Treated_at_Hospital	8 11	6 5	2 2	4 3	0 0	6 7
21	9.017465	Arrival	12	6	3	3	0	7
22	9.151836	Departure_Triage	9	6	2	4	0	7
23	9.428269	Departure_Triage	12	6	1	4	0	7
24	9.659940	Departure_Triage	0	6	0	5	0	7
25	9.980874	Arrival	13	7	1	5	0	7
26	10.158784	Treated_at_Hospital	9	6	1	4	0	8
27 28	10.541113 11.032700	Arrival Arrival	14 15	7 8	2 3	4 4	0 0	8 8
26 29	11.130910	Arrival	16	9	3 4	4	0	8
30	11.283764	Departure_Triage	14	ģ	3	4	0	8
31	11.999841	Departure_Triage	15	9	2	5	0	8
32	12.055727	Treated_at_Home	14	8	2	5	0	9
33	12.330836	Arrival	17	9	3	5	0	9
34	12.463720	Departure_Triage	17	9	2	6	0	9
35	12.969834	Departure_Triage	16	9	1 2	6 6	0	9 9
36 37	13.367343 13.382288	Arrival Arrival	18 19	10 11	3	6	0 0	9
38	13.763595	Departure_Triage	18	11	2	7	0	ý
39	13.865301	Departure_Triage	13	11	1	7	ø	9
40	14.922472	Treated_at_Hospital	15	10	1	6	0	10
41	15.073937	Treated_at_Home	16	9	1	6	0	11
42	15.839116	Treated_at_Home	13	8	1	6	0	12
43	15.863137	Treated_at_Hospital	17	7	1	5	0	13
44 45	16.500471 16.559463	Treated_at_Hospital Treated_at_Home	7 12	6 5	1 1	4 4	0 0	14 15
	16.748706	Arrival	20		2	4	0	15
	17.807303	Departure_Triage	19		1	5	0	15
48	17.987740	Arrival	21	7	2	5	0	15
	19.114715	Arrival	22		3	5	0	15
		bility of arriving pa	tient finds	an a	vail	able	nurs	e
	24417909328					-61-	L	
	g-run proba 28936623270	bility of critical pa	tient finds	an a	vall	арте	bea	
Joi		3374						
	 17602873267	9432						
		of people rejected d	ue to bed u	navai	labi	lity		
	78881987577							
		ation of each nurse						
	74724615868							
	rage number 61996895273	of occupied beds						
-	rage number	of patients treated	at home					
Ave		sick person gets bet	ter					
10.	72344634254	3344						

-Analysis of the Report

The expected number of patients that are treated at home can be calculated via statistic: p1 + ((1-p1)*(average number of rejected patients))

We can verify this via our outputs. Example output of empty system with 1000 healed patients: 0.3323353293413174 (The expected number of patients that are treated at home found in code)

0.2 + (0.8 * 0.17632552404438964) = 0.34106041923 (Calculated value)

There is an acceptable error. We verify our statistic.

The expected healing the of the patients can be calculated via:

```
(p1*(1/mu_s)) + ((1 - p1)*((average number of rejected patients*(1/mu_cb)*E[alpha]) + ((1 - average number of rejected patients)*(1/mu_cb))) + (1/mu_t)
```

We can verify this via our outputs. Example output of empty system with 1000 healed patients:

```
11.00051244527104 (The expected healing time of the patient found in code) (0.2 * (1/0.16)) + (0.8 * ((0.17632552404438964 * (1 / 0.142857143) * 1.5) + (0.82367447595 * (1 / 0.142857143))) + (1 / 0.357142857) = 7.3437114612 + 2.800000000112 = 10.1437114623
```

There is about ten percent error. This error is expected because in our formula we did not include the average waiting time of a patient for triage.

These calculations can be iterated with half-full and full systems. But since our limiting condition is 1000 healed patients the calculations will not diverge significantly.