

# **Modeling and Simulation**

**Submitted by:**

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**Submitted to: Ma'am Shaista Rais**

# **Project Title:**

## **Simulator and Queuing Calculator**

### **Introduction:**

Welcome to the Simulator and Queuing Calculator! This tool is designed to simplify complex queuing and process simulation tasks, providing users with an intuitive platform to model and analyse real-world scenarios.

### **Advantages:**

#### **1. Enhanced Learning Experience**

- Provides hands-on understanding of queuing theory and system behavior through interactive simulations.
- Supports various queuing models, making it versatile for academic and professional use.

#### **2. Time Efficiency**

- Automates complex calculations, saving significant time compared to manual methods.

#### **3. Accuracy and Reliability**

- Reduces the risk of errors commonly associated with manual computations.

#### **4. Customizability**

- Allows users to tailor simulations to specific requirements, supporting different arrival rates and service times
- Flexible enough to accommodate a wide range of use cases, from single-server queues to multi-server systems.

#### **5. Accessibility**

- Web-based tool accessible from any device with an internet connection.

# Screenshot of Project

## Simulation and Queuing Calculator

### Group Members:

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Queuing calculator

Simulator

## Select a Queuing Model

M/M/1

M/M/s

M/G/1

M/G/s

G/G/1

G/G/s

# Select a Simulator

M/M/S

M/G/S

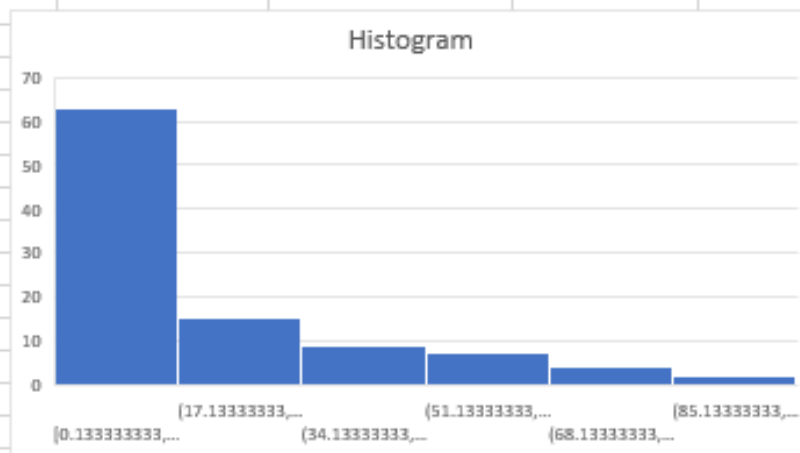
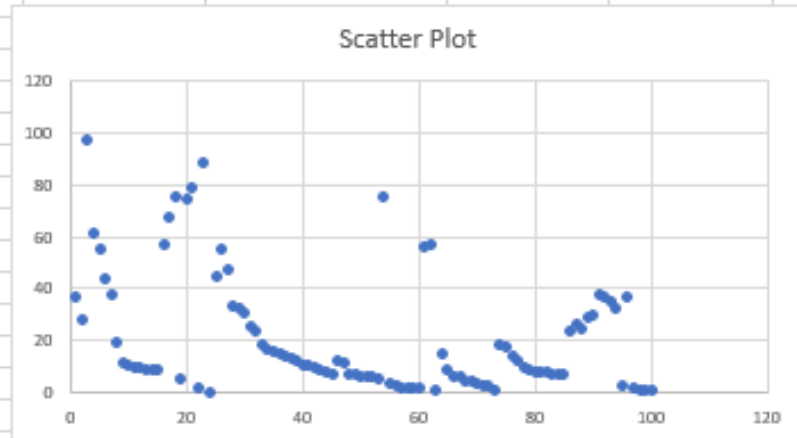
G/G/S

G/M/S

# Chi Square

SUM OF ST	2097.569258											
MEAN	20.97569258											
LAMBDA	0.04767423											
BIN NUMBER	BINS	OBSERVED FREQUENCY	UPPER BOUND	LOWER BOUND	PROBABILITY LB	PROBABILITY UB	PROBABILITY	EXPECTED FREQ	OF-EF	POWER	CHI-SQUARE	
Bin 1	0 - 10	50	10	0	0	0.379197513	0.379197513	37.91975127	12.08024873	145.9324094	3.848453761	
Bin 2	"10-20"	16	20	10	0.379197513	0.614604272	0.235406759	23.54067591	-7.540675906	56.86179312	2.415469859	
Bin 3	20 - 30	9	30	20	0.614604272	0.760745373	0.146141102	14.61411016	-5.614110155	31.51823284	2.156698732	
Bin 4	30 - 40	9	40	30	0.760745373	0.851470133	0.090724759	9.072475934	-0.072475934	0.005252761	0.000578978	
Bin 5	40 - 50	3	50	40	0.851470133	0.907792289	0.056322156	5.632215626	-2.632215626	6.928559102	1.230165811	
Bin 6	50 - 60	5	60	50	0.907792289	0.942757224	0.034964935	3.49649347	1.50350653	2.260531887	0.646513974	
Bin 7	60 - 70	3	70	60	0.942757224	0.964463542	0.021706318	2.170631843	0.829368157	0.68785154	0.316890007	
Bin 8	70 - 80	3	80	70	0.964463542	0.977938879	0.013475336	1.347533647	1.652466353	2.730645048	2.026402126	
Bin 9	80 - 90	1	90	80	0.977938879	0.986304401	0.008365522	0.83655224	0.16344776	0.02671517	0.03193485	
Bin 10	90 - 100	1	100	90	0.986304401	0.991497738	0.005193337	0.519333711	0.480666289	0.231040081	0.444877881	
											SUM	
											13.11798598	
				DF= K-P-1	DF=8							
				CALCULATED	13.11798598							
				TABULATED	15.50731306							
				RESULT:	SERVICE TIME FOLLOWS EXPONENETIAL DISTRIBUTIONS							
				MODEL	MM							

# Graphs



# DataSet

Sno.	PATIENT	ARRIVAL TIME	SERVICE TIME					
1	B/O PARVEENA	08/01/2024 14:34	37		51	TAHRA	8/17/2024 16:51:34	6.316666667
2	fatima	08/05/2024 22:53	28.2		52	irha	8/17/2024 17:12:36	5.966666667
3	b/a anum	8/13/2024 22:00:11	37.18333333		53	B/O AMBREEN	8/17/2024 18:01:47	5.15
4	b/a ani	8/15/2024 09:44:17	61.45		54	yasmeen	8/17/2024 18:58:55	75.5325432
5	b/a yasmeen	8/15/2024 16:04:05	55.11666667		55	sameena	8/17/2024 19:30:58	3.666666667
6	b/a iqra	8/16/2024 03:14:58	43.93333333	E	56	b/o afsha	8/17/2024 21:02:21	2.15
7	maria	8/16/2024 09:45:53	37.41666667		57	b/o salma	8/17/2024 21:17:27	1.9
8	murtaza	8/17/2024 04:14:04	18.95		58	rohan	8/17/2024 21:39:45	1.516666667
9	dua	8/17/2024 11:47:36	11.38333333		59	azsiya	8/17/2024 21:43:14	1.466666667
10	hajira bibi	8/17/2024 12:37:49	10.55		60	zain	8/17/2024 22:02:17	1.15
11	ab rafay	8/17/2024 13:50:36	9.333333333		61	mafal	8/17/2024 22:34:25	56.424234
12	b/o asia	8/17/2024 14:00:01	9.183333333		62	abu bakar	8/17/2024 22:35:27	57.42343243
13	tehreem	8/17/2024 14:38:25	8.55		63	arham	8/17/2024 22:42:40	0.466666667
14	b/o sabol	8/17/2024 14:53:02	8.3		64	anamta	8/18/2024 03:19:24	15.15
15	B/O MEHNAZ	8/17/2024 15:00:19	8.183333333		65	zaira	8/18/2024 10:16:09	8.2
16	B/O SHAZIA	8/17/2024 15:26:40	56.74		66	fatima	8/18/2024 12:22:59	6.083333333
17	umar	8/17/2024 16:03:19	67.897687		67	zainab	8/18/2024 12:25:09	6.05
18	b/o shaheen	8/17/2024 17:56:26	75.323134		68	b/o dua	8/18/2024 13:52:52	4.583333333
19	m aareeb	8/17/2024 18:14:58	4.933333333		69	furqan	8/18/2024 14:20:04	4.133333333
20	shazma	8/17/2024 19:12:35	75		70	b/o sumbul	8/18/2024 15:29:14	2.983333333
21	ibraheem	8/17/2024 19:46:09	78.76		71	m.hassan ali	8/18/2024 16:25:15	2.05
22	fatima	8/17/2024 21:39:37	1.516666667		72	b/o shiwa	8/18/2024 16:28:23	2
23	komal	8/17/2024 22:11:36	89		73	fiza	8/18/2024 18:03:43	0.4
24	b/o bushra bibi	8/17/2024 23:03:12	0.133333333		74	sanjida	8/18/2024 00:15:13	18.21666667
25	Rayan	8/13/2024 19:54:09	45		75	sadaf	8/18/2024 01:28:43	16.98333333
26	abirish	8/15/2024 15:46:29	55.4		76	muhammad	8/18/2024 04:50:47	13.61666667
27	b/o shaquitta	8/16/2024 00:04:19	47.11666667		77	tanis	8/18/2024 06:31:36	11.95
28	EMAAN FATIMA	8/16/2024 13:33:43	33.61666667		78	niyaz khan	8/18/2024 09:06:07	3.366666667
29	siman	8/16/2024 14:40:53	32.5		79	LIABA	8/18/2024 10:10:38	8.283333333
30	RAYAN ALI	8/16/2024 16:50:20	30.35		80	M SAAD	8/18/2024 10:19:02	8.15
31	m azan	8/16/2024 22:04:23	25.11666667		81	SUNBAL	8/18/2024 10:22:22	8.1
32	rubab	8/16/2024 23:54:24	23.28333333		82	MINAL	8/18/2024 10:44:18	7.733333333
33	sehreen fatima	8/17/2024 04:59:10	18.2		83	m fazsin	8/18/2024 11:13:35	7.25
34	hursin	8/17/2024 06:16:56	16.9		84	m.umar	8/18/2024 11:33:31	6.916666667
35	habiba	8/17/2024 07:24:20	15.78333333		85	ronaq	8/18/2024 11:43:53	6.733333333
36	m ayan	8/17/2024 08:00:45	15.16666667		86	m usman	8/18/2024 13:10:17	23.432432
37	urooj	8/17/2024 09:18:32	13.86666667		87	abdullah	8/18/2024 13:57:57	26.4324234
38	aqsa	8/17/2024 10:29:54	12.68333333		88	muzammil	8/18/2024 13:59:53	24.53532
39	ALINA	8/17/2024 11:13:39	11.95		89	abdul hadi	8/18/2024 14:15:04	28.432432
40	zeenat	8/17/2024 12:41:33	10.48333333		90	bariar	8/18/2024 14:30:11	29.4214214
41	b/o sakina	8/17/2024 12:53:54	10.28333333		91	B/o Yamna	8/18/2024 14:49:52	37.423432
42	hasnain	8/17/2024 13:16:21	9.916666667		92	hanaza	8/18/2024 14:51:50	36.4324324
43	yashwa	8/17/2024 14:51:43	8.316666667		93	ab rafy	8/18/2024 15:01:09	34.6432532
44	harsiba	8/17/2024 15:28:07	7.716666667		94	shAZAIN	8/18/2024 15:09:01	32.53454
45	M. USMAN	8/17/2024 16:15:52	6.916666667		95	mavia	8/18/2024 16:08:38	2.316666667
46	DUA	8/17/2024 16:25:12	12.4323432		96	b/o usra	8/18/2024 16:28:53	36.4324324
47	m sufiyan	8/17/2024 16:28:29	11.4324324		97	usman	8/18/2024 16:39:59	1.8
48	MUSA	8/17/2024 16:41:10	6.5		98	anaya	8/18/2024 17:41:21	0.783333333
49	SOHAIB	8/17/2024 16:43:31	6.45		99	siza	8/18/2024 17:46:17	0.7
50	ZARA	8/17/2024 16:47:41	6.383333333		100	ume hani	8/18/2024 18:04:47	0.383333333