

Mohammad Abubakar Atiq, BSIE, F2022031002
Department of Mechanical Engineering
Program: BS Industrial Engineering
Example 5: The Grocery Checkout, a Single-Server Queue

Table 9	Distribution of Time between Arrivals		
	Interarrival Time	Probability	Cumulative Probability
	1	0.125	0.125
	2	0.125	0.250
	3	0.125	0.375
	4	0.125	0.500
	5	0.125	0.625
	6	0.125	0.750
	7	0.125	0.875
	8	0.125	1.000

Table 10	Distribution of Service Times		
	Service Times (Minutes)	Probability	Cumulative Probability
	1	0.100	0.100
	2	0.200	0.300
	3	0.300	0.600
	4	0.250	0.850
	5	0.100	0.950
	6	0.050	1.000

Customer	Random Number	Interarrival Time	Service Time
#		IAT	ST
1	0.710	6	4
2	0.363	3	3
3	0.609	5	4
4	0.671	6	4
5	0.244	2	2
6	0.749	6	4
7	0.081	1	1
8	0.135	2	2
9	0.554	5	3
10	0.098	1	1
11	0.156	2	2
12	0.413	4	3
13	0.302	3	3
14	0.674	6	4
15	0.287	3	2
16	0.189	2	2
17	0.063	1	1
18	0.761	7	4
19	0.607	5	4
20	0.623	5	4
21	0.618	5	4
22	0.960	8	6
23	0.037	1	1
24	0.159	2	2
25	0.269	3	2
26	0.423	4	3
27	0.949	8	5
28	0.962	8	6
29	0.856	7	5
30	0.817	7	4
31	0.566	5	3
32	0.607	5	4
33	0.881	8	5
34	0.549	5	3
35	0.804	7	4
36	0.027	1	1
37	0.706	6	4
38	0.019	1	1
39	0.013	1	1
40	0.725	6	4
41	0.041	1	1
42	0.631	6	4
43	0.126	2	2
44	0.167	2	2
45	0.271	3	2
46	0.387	4	3
47	0.809	7	4
48	0.583	5	3
49	0.427	4	3
50	0.087	1	1
51	0.810	7	4
52	0.823	7	4
53	0.772	7	4
54	0.963	8	6
55	0.787	7	4
56	0.474	4	3
57	0.067	1	1
58	0.712	6	4
59	0.938	8	5
60	0.115	1	2

Customer#	Interarrival Time	Arrival Time	Service Begins Time	Service Time	Service End Time	Time in Queue	Time in System
1	0	0	0	4	4	0	4
2	6	6	6	3	9	0	3
3	3	9	9	4	13	0	4
4	5	14	14	4	18	0	4
5	6	20	20	2	22	0	2
6	2	22	22	4	26	0	4
7	6	28	28	1	29	0	1
8	1	29	29	2	31	0	2
9	2	31	31	3	34	0	3
10	5	36	36	1	37	0	1
11	1	37	37	2	39	0	2
12	2	39	39	3	42	0	3
13	4	43	43	3	46	0	3
14	3	46	46	4	50	0	4
15	6	52	52	2	54	0	2
16	3	55	55	2	57	0	2
17	2	57	57	1	58	0	1
18	1	58	58	4	62	0	4
19	7	65	65	4	69	0	4
20	5	70	70	4	74	0	4
21	5	75	75	4	79	0	4
22	5	80	80	6	86	0	6
23	8	88	88	1	89	0	1
24	1	89	89	2	91	0	2
25	2	91	91	2	93	0	2
26	3	94	94	3	97	0	3
27	4	98	98	5	103	0	5
28	8	106	106	6	112	0	6
29	8	114	114	5	119	0	5
30	7	121	121	4	125	0	4
31	7	128	128	3	131	0	3
32	5	133	133	4	137	0	4
33	5	138	138	5	143	0	5
34	8	146	146	3	149	0	3
35	5	151	151	4	155	0	4
36	7	158	158	1	159	0	1
37	1	159	159	4	163	0	4
38	6	165	165	1	166	0	1
39	1	166	166	1	167	0	1
40	1	167	167	4	171	0	4
41	6	173	173	1	174	0	1
42	1	174	174	4	178	0	4
43	6	180	180	2	182	0	2
44	2	182	182	2	184	0	2
45	2	184	184	2	186	0	2
46	3	187	187	3	190	0	3
47	4	191	191	4	195	0	4
48	7	198	198	3	201	0	3
49	5	203	203	3	206	0	3
50	4	207	207	1	208	0	1
51	1	208	208	4	212	0	4
52	7	215	215	4	219	0	4
53	7	222	222	4	226	0	4
54	7	229	229	6	235	0	6
55	8	237	237	4	241	0	4
56	7	244	244	3	247	0	3
57	4	248	248	1	249	0	1
58	1	249	249	4	253	0	4
59	6	255	255	5	260	0	5