旁听访问入口过期 三月 20, 2020
。您已于 三月 20, 2020 失去课程访问权限，包括正在上的课程。

Week's class Quiz :check your understanding

Question 1

0 points possible (ungraded)

Which figure corresponds to an M/M/C/C system?

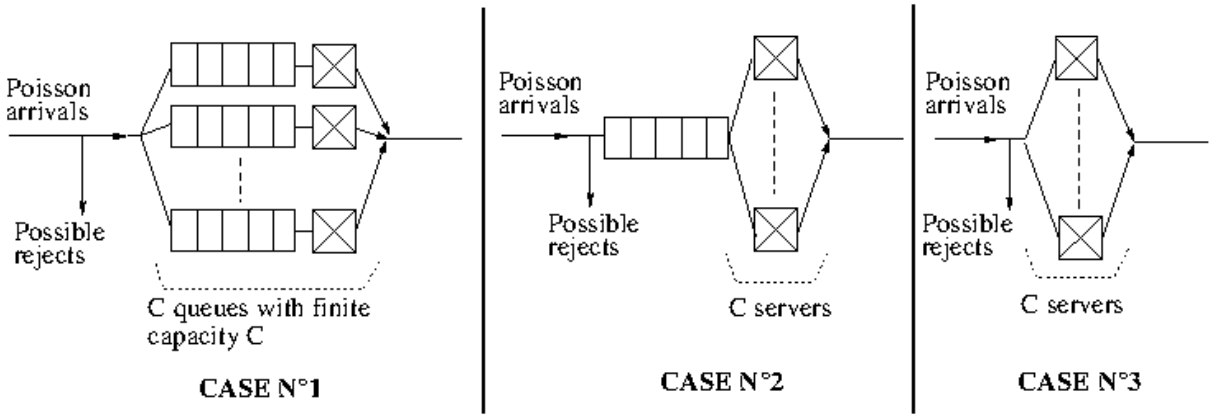

Figure 1. Question 1

- Case number 1
- Case number 2
- Case number 3

您已经尝试了0次，总共可以尝试2次

提交

Question 2

0 points possible (ungraded)

Consider an M/M/C/C system for which input interarrivals are equal on average to 10 seconds. The time unit is one second. Which of the following statements are true?

- [ ] The number of arrivals per minute is 60.
- [ ] The arrivals do not follow a Poisson process.
- [ ] The arrivals follow a Poisson process with rate $\lambda = 0.1 \text{ sec}^{-1}$.
- [ ] The arrivals follow a Poisson process with rate $\lambda = 10 \text{ sec}^{-1}$.
- [ ] The arrival times follow a Poisson distribution with rate $\lambda = 10 \text{ sec}$.

提交 您已经尝试了0次，总共可以尝试3次

Question 3

0 points possible (ungraded)

Consider a queue. There are on average 30 arrivals per minute and the mean service time is 40 seconds.

What is the load in Erlangs?

- ○ 0.75 Erlangs
- ○ 1.33 Erlangs
- ○ 20 Erlangs

- 45 Erlangs
- 80 Erlangs
- 1200 Erlangs

提交 您已经尝试了0次，总共可以尝试3次

Question 4

0 points possible (ungraded)

Consider an M/M/C/C queue loaded at 15 Erlangs. We want a loss probability less than or equal to 1%.

What is the minimum number of channels?

Erlang B Traffic Table

Maximum Offered Load Versus E_a and C
E_a is in %

C/E_a	0.01	0.05	0.1	0.5	1.0	2	5	10	15	20	30	40
1	.0001	.0005	.0010	.0050	.0101	.0204	.0526	.1111	.1765	.2500	.4286	.6667
2	.0142	.0321	.0458	.1054	.1526	.2235	.3813	.5954	.7962	1.000	1.449	2.000
3	.0868	.1517	.1938	.3490	.4555	.6022	.8994	1.271	1.603	1.930	2.633	3.480
4	.2347	.3624	.4393	.7012	.8694	1.092	1.525	2.045	2.501	2.945	3.891	5.021
5	.4520	.6486	.7621	1.132	1.361	1.657	2.219	2.881	3.454	4.010	5.189	6.596
6	.7282	.9957	1.146	1.622	1.909	2.276	2.960	3.758	4.445	5.109	6.514	8.191
7	1.054	1.392	1.579	2.158	2.501	2.935	3.738	4.666	5.461	6.230	7.856	9.800
8	1.422	1.830	2.051	2.730	3.128	3.627	4.543	5.597	6.498	7.369	9.213	11.42
9	1.826	2.302	2.558	3.333	3.783	4.345	5.370	6.546	7.551	8.522	10.58	13.05
10	2.260	2.803	3.092	3.961	4.461	5.084	6.216	7.511	8.616	9.685	11.95	14.68
11	2.722	3.329	3.651	4.610	5.160	5.842	7.076	8.487	9.691	10.86	13.33	16.31
12	3.207	3.878	4.231	5.279	5.876	6.615	7.950	9.474	10.78	12.04	14.72	17.95
13	3.713	4.447	4.831	5.964	6.607	7.402	8.835	10.47	11.87	13.22	16.11	19.60
14	4.239	5.032	5.446	6.663	7.352	8.200	9.730	11.47	12.97	14.41	17.50	21.24
15	4.781	5.634	6.077	7.376	8.108	9.010	10.63	12.48	14.07	15.61	18.90	22.89
16	5.339	6.250	6.722	8.100	8.875	9.828	11.54	13.50	15.18	16.81	20.30	24.54
17	5.911	6.878	7.378	8.834	9.652	10.66	12.46	14.52	16.29	18.01	21.70	26.19
18	6.496	7.519	8.046	9.578	10.44	11.49	13.39	15.55	17.41	19.22	23.10	27.84
19	7.093	8.170	8.724	10.33	11.23	12.33	14.32	16.58	18.53	20.42	24.51	29.50
20	7.701	8.831	9.412	11.09	12.03	13.18	15.25	17.61	19.65	21.64	25.92	31.15
21	8.319	9.501	10.11	11.86	12.84	14.04	16.19	18.65	20.77	22.85	27.33	32.81
22	8.946	10.18	10.81	12.64	13.65	14.90	17.13	19.69	21.90	24.06	28.74	34.46
23	9.583	10.87	11.52	13.42	14.47	15.76	18.08	20.74	23.03	25.28	30.15	36.12
24	10.23	11.56	12.24	14.20	15.30	16.63	19.03	21.78	24.16	26.50	31.56	37.78
25	10.88	12.26	12.97	15.00	16.13	17.51	19.99	22.83	25.30	27.72	32.97	39.44
26	11.54	12.97	13.70	15.80	16.96	18.38	20.94	23.89	26.43	28.94	34.39	41.10
27	12.21	13.69	14.44	16.60	17.80	19.27	21.90	24.94	27.57	30.16	35.80	42.76
28	12.88	14.41	15.18	17.41	18.64	20.15	22.87	26.00	28.71	31.39	37.21	44.41
29	13.56	15.13	15.93	18.22	19.49	21.04	23.83	27.05	29.85	32.61	38.63	46.07
30	14.25	15.86	16.68	19.03	20.34	21.93	24.80	28.11	31.00	33.84	40.05	47.74
31	14.94	16.60	17.44	19.85	21.19	22.83	25.77	29.17	32.14	35.07	41.46	49.40
32	15.63	17.34	18.21	20.68	22.05	23.73	26.75	30.24	33.28	36.30	42.88	51.06
33	16.34	18.09	18.97	21.51	22.91	24.63	27.72	31.30	34.43	37.52	44.30	52.72
34	17.04	18.84	19.74	22.34	23.77	25.53	28.70	32.37	35.58	38.75	45.72	54.38
35	17.75	19.59	20.52	23.17	24.64	26.44	29.68	33.43	36.72	39.99	47.14	56.04
36	18.47	20.35	21.30	24.01	25.51	27.34	30.66	34.50	37.87	41.22	48.56	57.70
37	19.19	21.11	22.08	24.85	26.38	28.25	31.64	35.57	39.02	42.45	49.98	59.37
38	19.91	21.87	22.86	25.69	27.25	29.17	32.62	36.64	40.17	43.68	51.40	61.03
39	20.64	22.64	23.65	26.53	28.13	30.08	33.61	37.72	41.32	44.91	52.82	62.69
40	21.37	23.41	24.44	27.38	29.01	31.00	34.60	38.79	42.48	46.15	54.24	64.35
41	22.11	24.19	25.24	28.23	29.89	31.92	35.58	39.86	43.63	47.38	55.66	66.02
42	22.85	24.97	26.04	29.09	30.77	32.84	36.57	40.94	44.78	48.62	57.08	67.68
43	23.59	25.75	26.84	29.94	31.66	33.76	37.57	42.01	45.94	49.85	58.50	69.34

Figure 3. Erlang tables (Question 4)

- ○ 15
- ○ 19

- 24
- 28
- 31
- 42

提交 您已经尝试了0次，总共可以尝试3次

Question 5

0 points possible (ungraded)

Consider an M/M/1 queue with two input sources: source 1 generates "positive" clients according to a Poisson process with rate λ_p, while source 2 generates "negative" clients according to a Poisson process with rate λ_n.

When a negative client arrives in the queue, if there is a positive client in the queue, the negative client destroys one positive client and it is itself also destroyed. If the queue is empty, the negative client is destroyed as soon as it arrives. Positive clients are processed normally.

The average service rate is $\mu = 10\ \text{sec}^{-1}$. The arrival rates of positive and negative clients are $\lambda_p = 8\ \text{sec}^{-1}$, and $\lambda_n = 2\ \text{sec}^{-1}$.

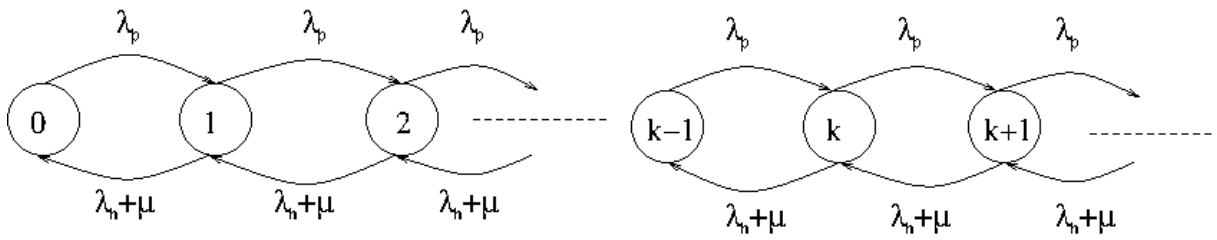

Figure 3. Question 8

What is the transition rate from state 2 to state 3?

sec^{-1}

What is the transition rate from state 3 to state 2?

$\sec^{-1}$

What is the mean queue length?

clients

提交 您已经尝试了0次，总共可以尝试3次

Question 6

0 points possible (ungraded)

Consider an M/M/2 queue. Its mean arrival rate is λ and its average service rate is μ (for each server).

What is its mean sojourn time?

- $\frac{2\rho'}{1-\rho'^2}\frac{1}{\mu}$
- $\frac{2\rho'}{1-\rho'^2}\frac{1}{\mu}+\frac{1}{\mu}$
- $\frac{1}{1-\rho'^2}\frac{1}{\mu}$

提交 您已经尝试了0次，总共可以尝试2次

Question 7

0 points possible (ungraded)

Consider an M/M/3 queue. The input rate is λ and the service rates is μ for each server.

What is the value of the transition rate from state $N(t) = 7$ clients to $N(t) = 6$?

- μ
- 2μ
- 3μ
- 7μ
- λ

What is the value of the transition rate from state $N(t) = 6$ clients to $N(t) = 7$?

- μ
- 2μ
- 3μ
- 7μ
- λ

提交 您已经尝试了0次，总共可以尝试3次

Question 8

0 points possible (ungraded)

Consider an M/M/∞ queue. The input rate is λ and the service rate is μ for each server.

What is the value of the transition rate from state $N(t) = 7$ clients to $N(t) = 6$?

- μ
- 2μ
- 3μ
- λ
- other

What is the value of the transition rate from state $N(t) = 6$ clients to $N(t) = 7$?

- μ
- 2μ
- 3μ
- λ
- other

提交 您已经尝试了0次，总共可以尝试3次

Question 9

0 points possible (ungraded)

Let us compare an M/M/∞ queue and an M/M/1/K queue.

Is the probability that the number of clients in the M/M/∞ queue is larger than $K + 1$ equal to the blocking rate of the M/M/1/K queue:
$P_{M/M/\infty}(X(t) > K + 1) = P_{M/M/1/K}(X(t) = K))$

Yes

No

提交 您已经尝试了0次，总共可以尝试1次

讨论

隐藏讨论

主题： Week 5 / Quiz

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显示所有帖子 近期活动

暂无关于此主题的帖子。