Tian Qiu

IE 336

HW 10

1.

The SAS System

Obs	arrival	service
1	14.72	25.23
2	16.39	12.68
3	2.58	30.18
4	0.96	55.07
5	0.51	16.16
6	0.66	17.90
7	8.07	32.59
8	0.40	20.83
9	91.70	37.62
10	0.60	61.90
11	2.10	26.54
12	1.11	35.62
13	45.32	17.34
14	1.18	22.44
15	71.51	51.06
16	0.86	35.40
17	42.66	38.29
18	74.55	20.86
19	12.47	22.16
20	15.99	13.87
21	27.66	29.20

Obs	arrival	service
22	1.56	27.29
23	15.02	30.54
24	24.86	41.23
25	18.67	24.60
26	14.42	33.58
27	2.38	28.29
28	22.50	53.61
29	23.69	20.82
30	19.86	40.10
31	28.02	37.41
32	1.61	26.45
33	1.80	29.77
34	14.67	33.74
35	10.47	43.28
36	39.57	20.92
37	42.45	73.82
38	32.96	31.37
39	0.55	32.03
40	20.02	40.30
41	25.99	25.40
42	5.18	29.97
43	11.82	18.65
44	0.60	34.58
45	34.80	22.95
46	20.66	33.06
47	5.18	31.73
48	25.99	30.74
49	5.31	23.54
50	0.80	31.53

2.

(a) Arrival: Mean = 18.0682 Service: Mean = 31.4848

Variable: arrival

Moments

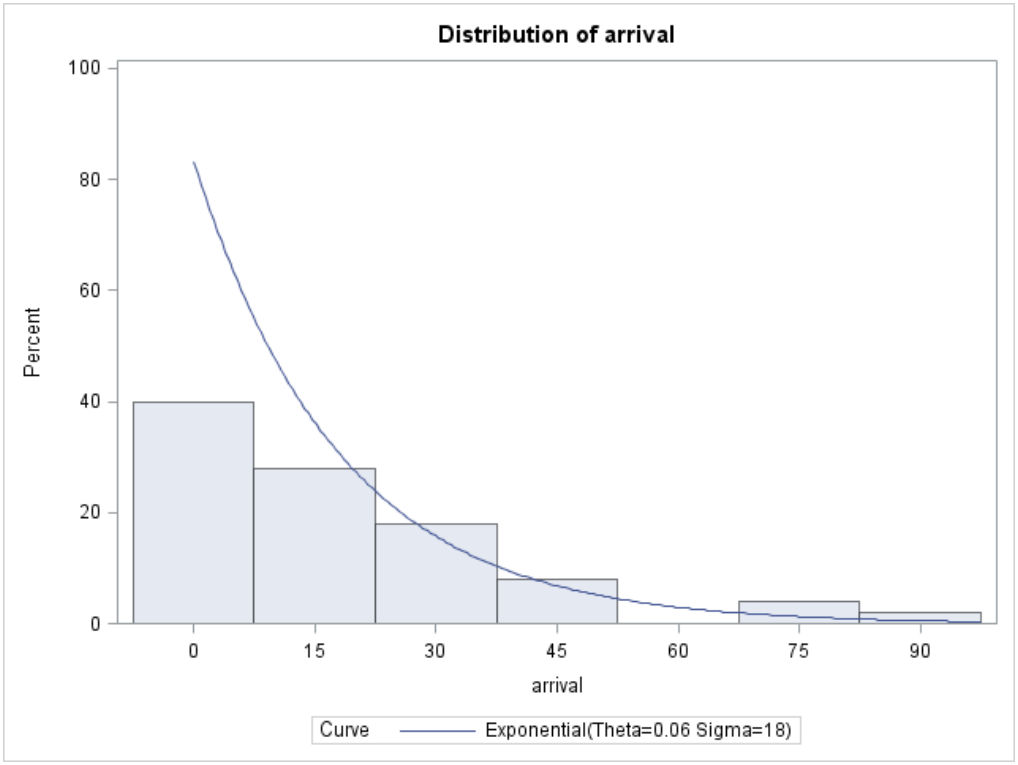
N	50	**Sum Weights**	50
Mean	18.0682	**Sum Observations**	903.41
Std Deviation	20.4175146	**Variance**	416.874901
Skewness	1.77966511	**Kurtosis**	3.55821467
Uncorrected SS	36749.8627	**Corrected SS**	20426.8701
Coeff Variation	113.002483	**Std Error Mean**	2.8874726

Variable: service

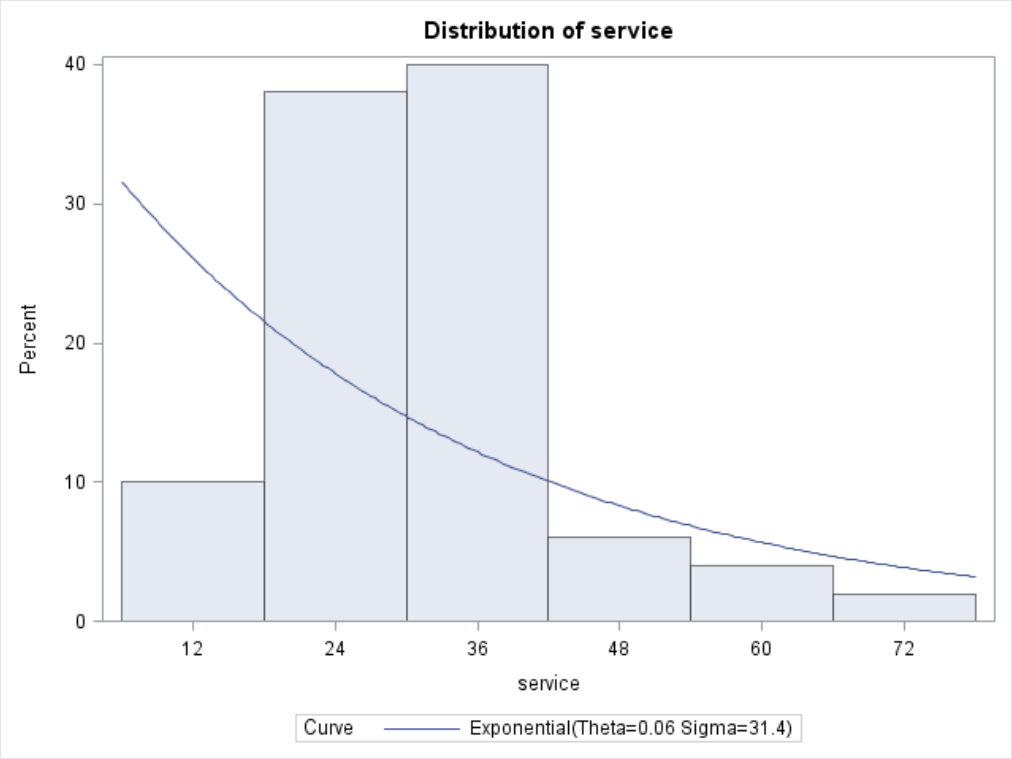
Moments

N	50	**Sum Weights**	50
Mean	31.4848	**Sum Observations**	1574.24
Std Deviation	12.0596491	**Variance**	145.435136
Skewness	1.31485198	**Kurtosis**	2.55292012
Uncorrected SS	56690.9532	**Corrected SS**	7126.32165
Coeff Variation	38.303083	**Std Error Mean**	1.70549193

(b)

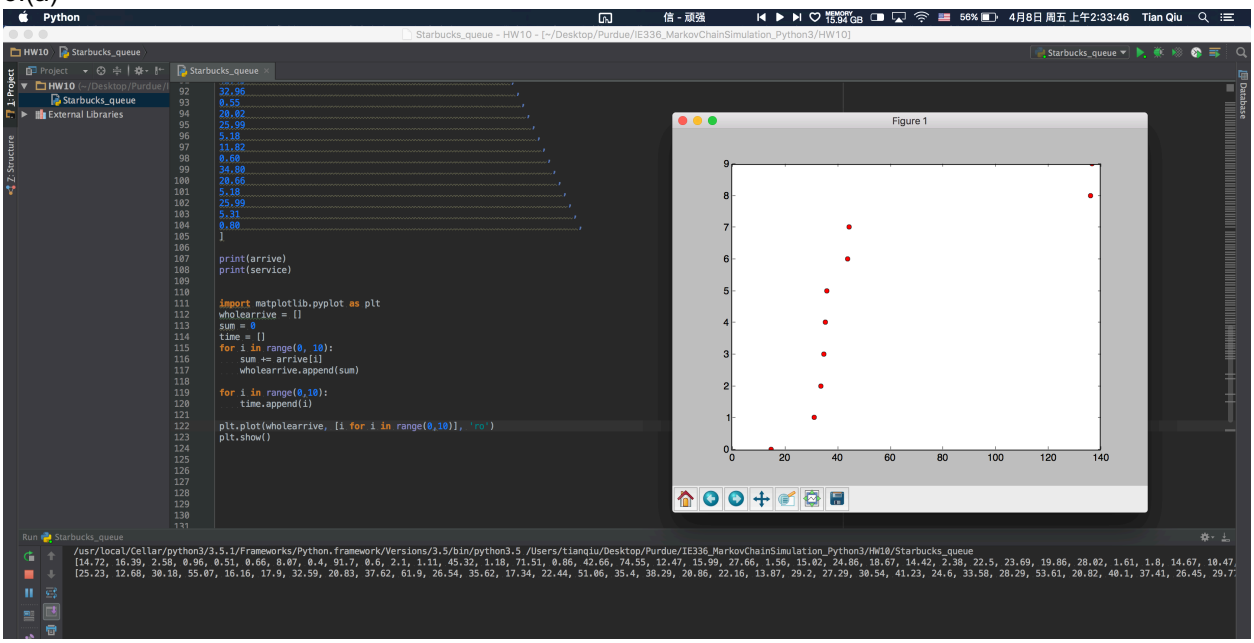


(c)



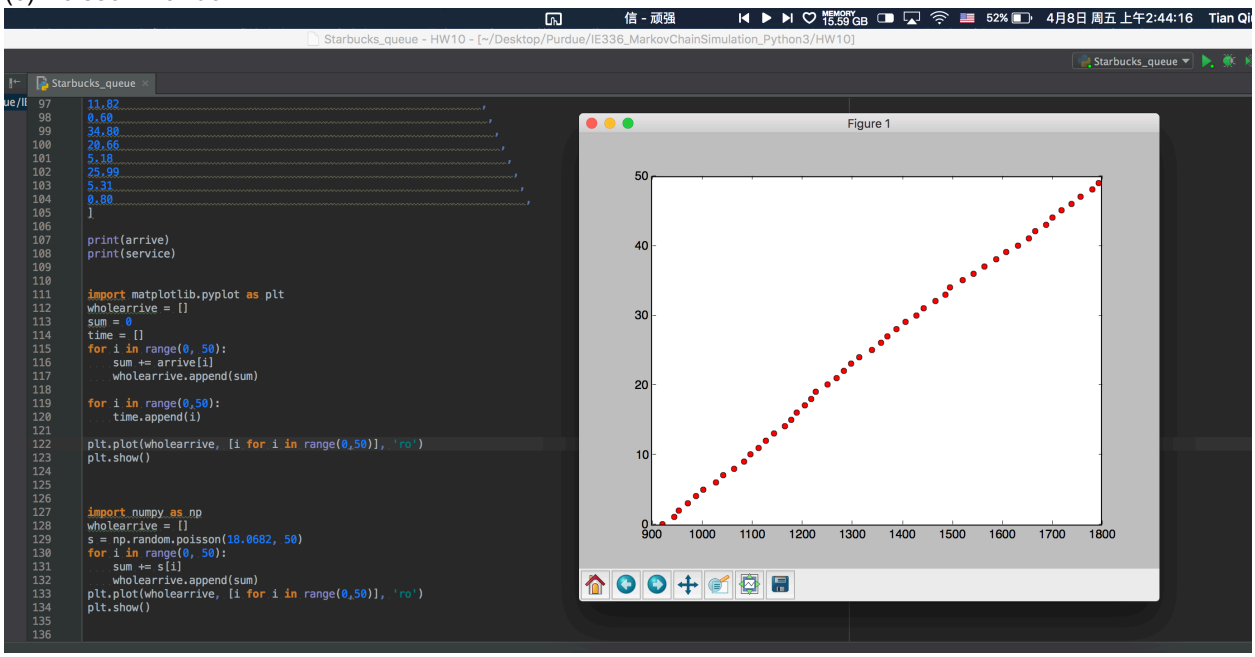
(d) The distribution of arrival looks exponential while the distribution of service looks not that exponential bu slightly normal. My conclusion is that it is because the time of arrival depends on how people flow but the time of service depends on the server.

3.(a)

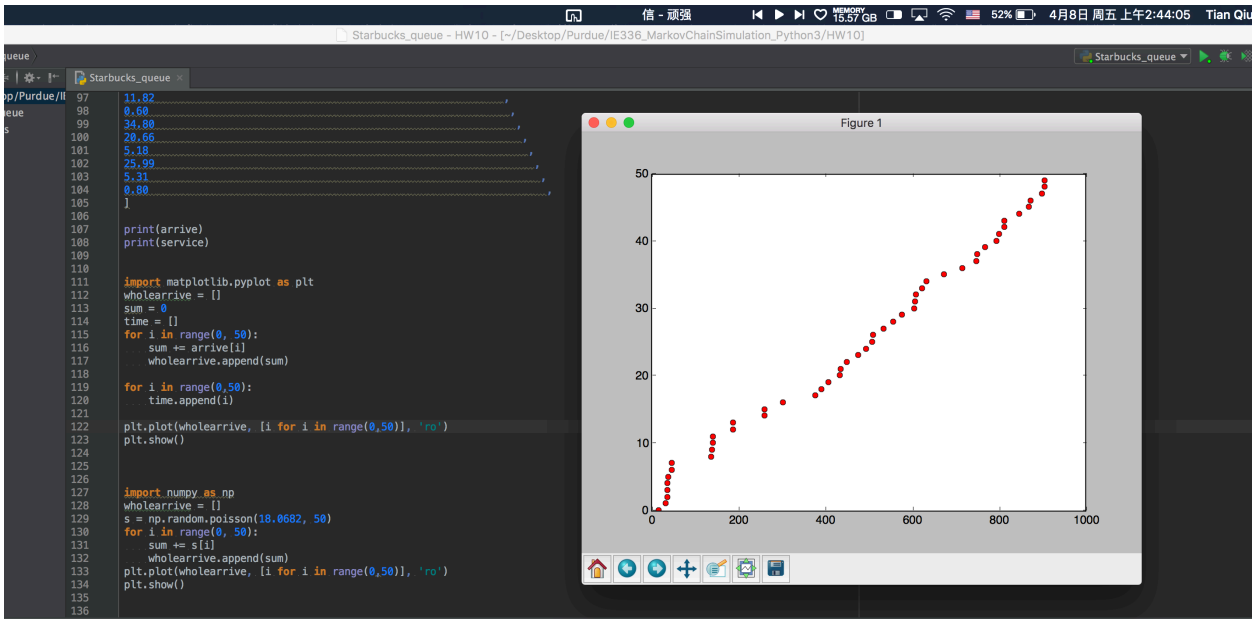


(b) The same as 2.

(c) Poisson Random:



Real data:



(d) They are not quite similar. It is not enough to say poisson is a good model to simulate the queue theory. I would say we need more test case like 500 people to test this model.