IE 306 - Homework 2

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May 20, 2020

1 Introduction

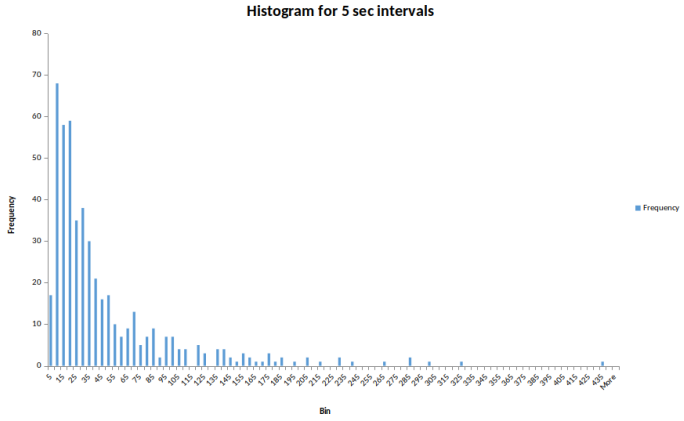
In this project, we are given the observed interarrival times of customers to a system and we are tasked to find the best-fitting random distribution. To do that we will compare the empirical data with two of possible distributions: uniform distribution and exponential distribution. We will use various statistical tests to find the most fitting one.

2 Kolmogorov-Smirnov test

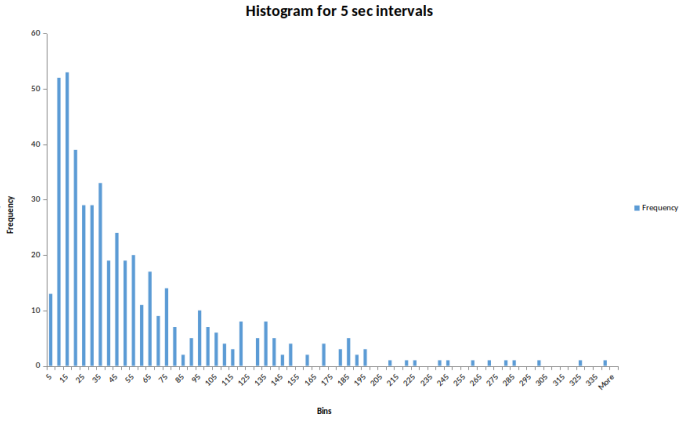
3 Dataset statistcs

	count	mean	std	min	25%	50%	75%	max
Day 1	488	44.752	52.804	1	13	26	54	434
Day 2	488	53.801	55.092	0	15	35	69.25	339

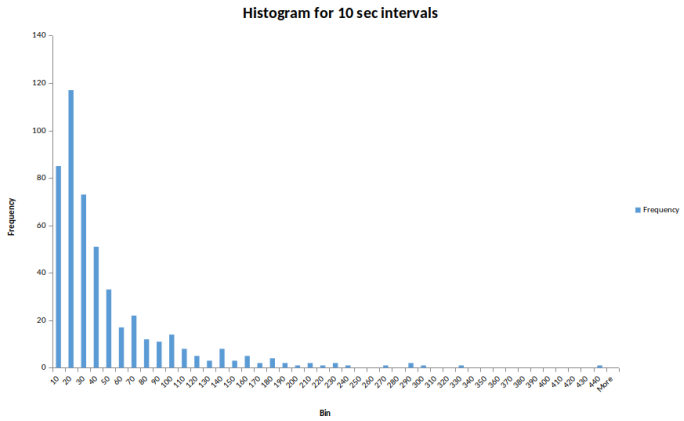
4 Frequency histograms



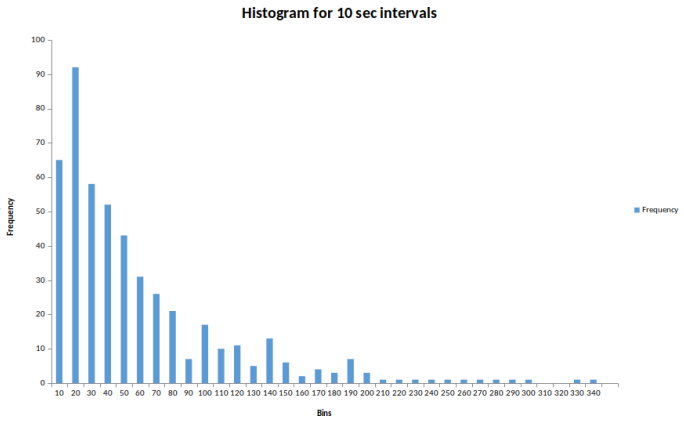
(a) Frequency histogram 5 seconds intervals of day 1



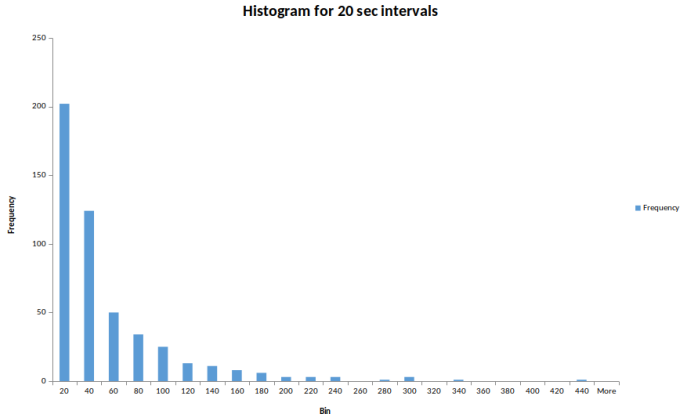
(b) Frequency histogram 5 seconds intervals of day 2



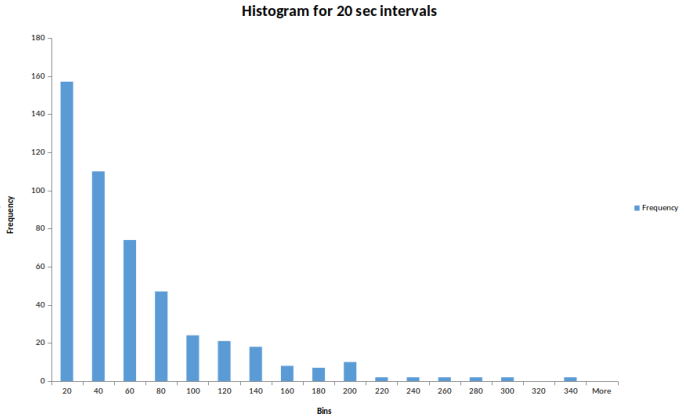
(a) Frequency histogram 10 seconds intervals of day 1



(b) Frequency histogram 10 seconds intervals of day 2



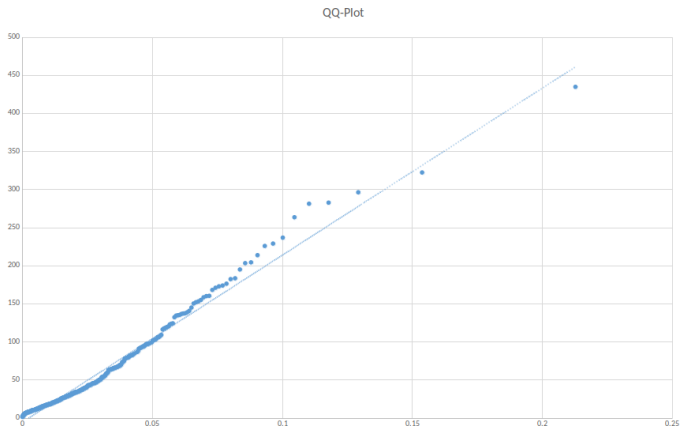
(a) Frequency histogram 20 seconds intervals of day 1



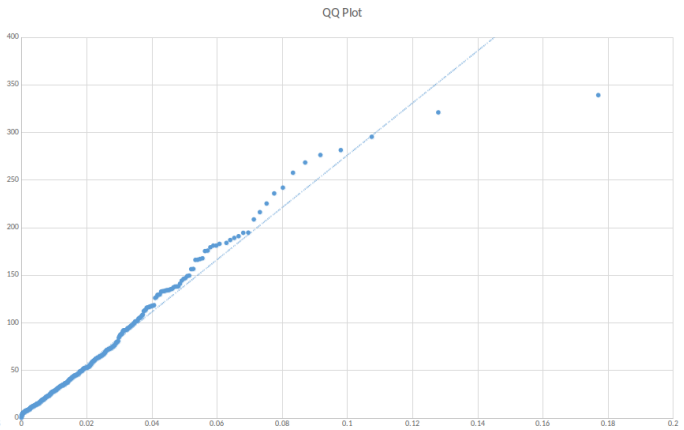
(b) Frequency histogram 20 seconds intervals of day 2

5 Chi-Squared test

6 QQ-Plot

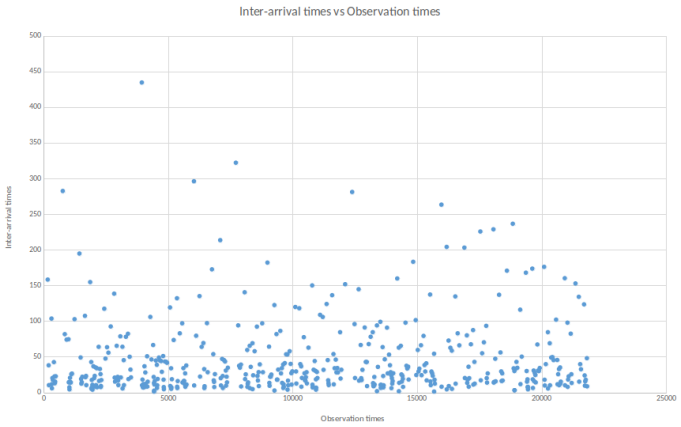


(a) QQ-Plot of day 1

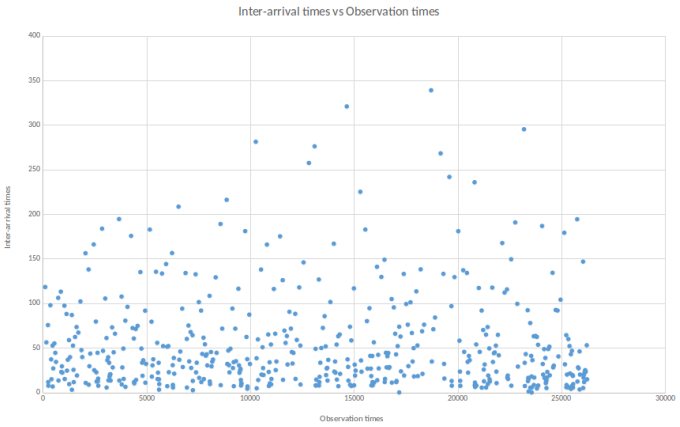


(b) QQ-Plot of day 2

7 Interarrival time plot



(a) Interarrival time vs Observer times for day 1



(b) Interarrival time vs Observer times for day 2

8 Autocorrelation test

8.0.1 Lag 1

8.0.2 Lag 2