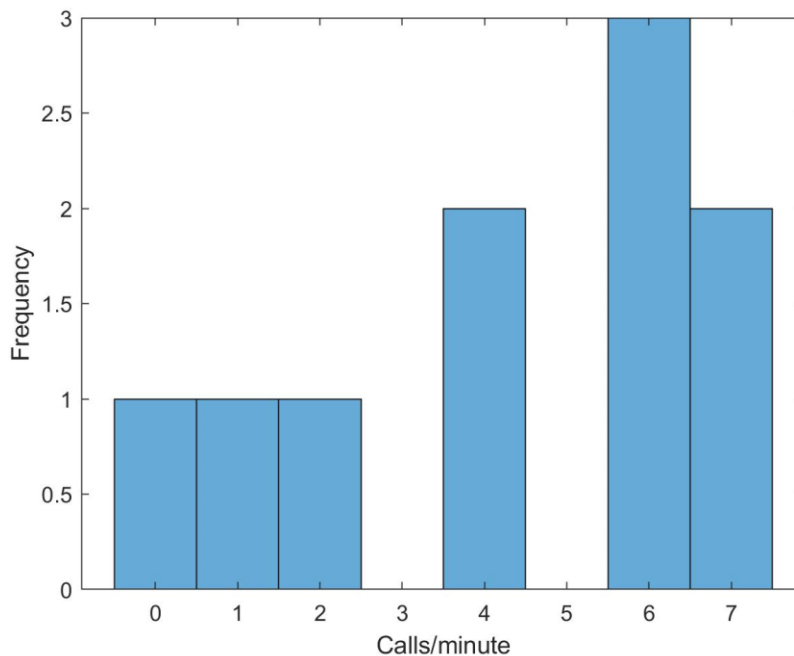


ChE 231
Spring 2019
Written Homework #1 (Solutions)

1. Problem Set 24.1, Problems 2 (histogram only) and 12

P2.



P12.

$$\bar{x} = 4.3, s = 2.541, \text{IQR} = 4$$

2. Problem Set 24.2, Problems 4 and 12

P4.

This is an example of a “waiting time problem” (and so is the next problem). We wait for the first *Six*. The sample space is infinite, the outcomes are ($S = \text{Six}$, $S^c = \text{No Six}$)

$$S, S^cS, S^cS^cS, S^cS^cS^cS, \dots$$

P12.

The subsets are

$$\emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, S.$$

3. Problem Set 24.3, Problems 2, 12 and 14

P2.

$$\frac{12}{36} = \frac{1}{3}$$

P12.

$P^4 = 0.99$ gives $P = 0.99749$ as the probability that a single switch does not fail during a given time interval, and the *answer* is the complement of this, namely, 0.25%.

P14.

Drawing without replacement from the (hypothetically infinite) production process that is going on. The probabilities are

(a) $0.98^2 = 96.04\%$

(b) $2 \cdot 0.98 \cdot 0.02 = 3.92\%$

(c) $0.02^2 = 0.04\%$

and the sum is 1.