

Quiz 5 – Solutions

1. The population means and standard deviations are:

- a. $\mu = 0.1, \sigma = 0.3$
- b. $\mu = 0.5, \sigma = 0.5$
- c. $\mu = 0.9, \sigma = 0.3$
- d. $\mu = 2.0, \sigma = 1.342$
- e. $\mu = 10.0, \sigma = 2.236$
- f. $\mu = 18.0, \sigma = 1.342$
- g. $\mu = 0.1, \sigma = 0.316$
- h. $\mu = 2.0, \sigma = 1.414$
- i. $\mu = 10.0, \sigma = 3.162$

2. From the Minitab output on page 2 the sample means and standard deviations are:

- a. $\bar{x} = 0.0940$ and $s = 0.2921$
- b. $\bar{x} = 0.4580$ and $s = 0.4987$
- c. $\bar{x} = 0.9120$ and $s = 0.2836$
- d. $\bar{x} = 2.0320$ and $s = 1.3823$
- e. $\bar{x} = 9.9940$ and $s = 2.1825$
- f. $\bar{x} = 17.996$ and $s = 1.3520$
- g. $\bar{x} = 0.1140$ and $s = 0.3365$
- h. $\bar{x} = 2.0260$ and $s = 1.4246$
- i. $\bar{x} = 9.6920$ and $s = 3.0790$

These are close to the population values in problem 1. Consider the histograms on pages 2 through

7. In order of the columns these display the following characteristics:

- a. There are only two possible values for a Bernoulli distribution, 0 or 1. Because the probability of a success is so low, 0.1, there are mostly 0s. Hence, the distribution is right skewed and unimodal.
- b. This Bernoulli distribution has success probability of 0.5. The histogram is nearly symmetric, as there are near equal numbers of 0s and 1s. I would call it unimodal and symmetric.
- c. This histogram is the opposite of the one in part a. It is left skewed and unimodal.
- d. This binomial distribution is unimodal and right skewed. Notice that there are higher frequencies of the smaller values of the random variable (0, 1, 2, etc...). This is due to the low success probability (0.1).
- e. Unimodal and symmetric.
- f. Unimodal and left skewed.
- g. Unimodal and right skewed.
- h. Unimodal and right skewed.
- i. Unimodal and symmetric.

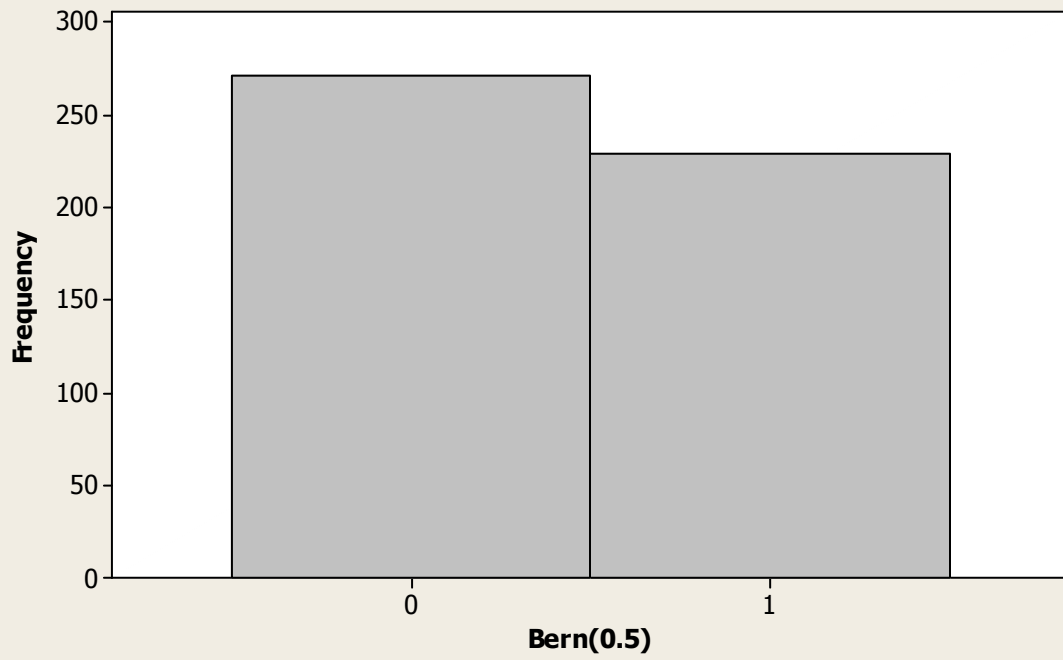
There are no observations in any of these histograms that look like outliers.

Minitab output:

Variable	Mean	StDev
Bern(0.1)	0.0940	0.2921
Bern(0.5)	0.4580	0.4987
Bern(0.9)	0.9120	0.2836
Bin(20,0.1)	2.0320	1.3823
Bin(20,0.5)	9.9940	2.1825
Bin(20,0.9)	17.996	1.352
Pois(0.1)	0.1140	0.3365
Pois(2)	2.0260	1.4246
Pois(10)	9.692	3.079



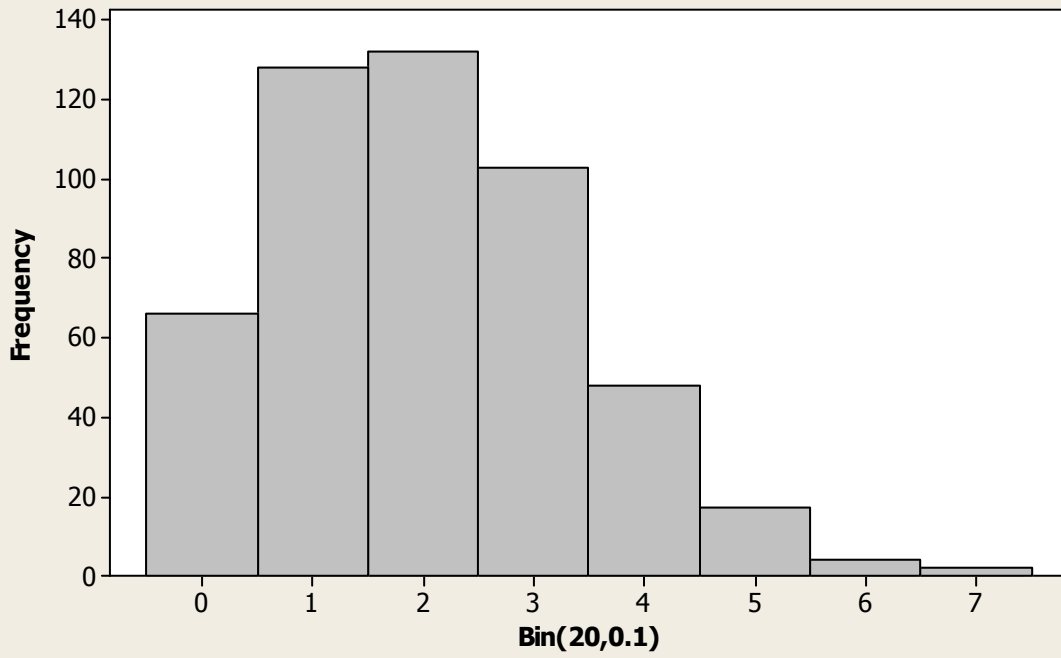
Histogram of Bern(0.5)



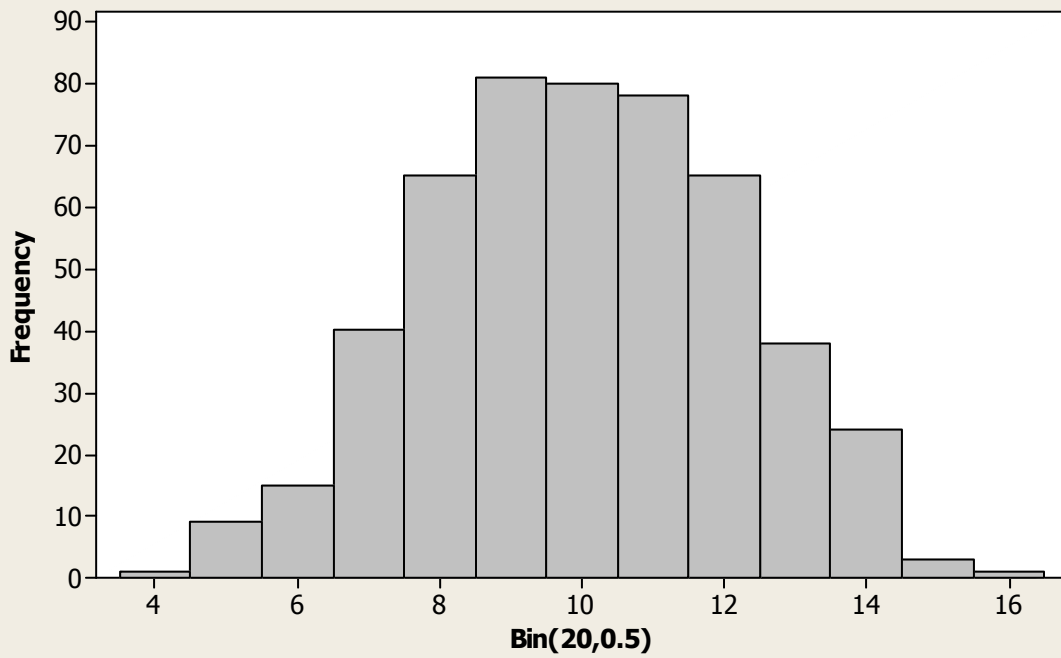
Histogram of Bern(0.9)



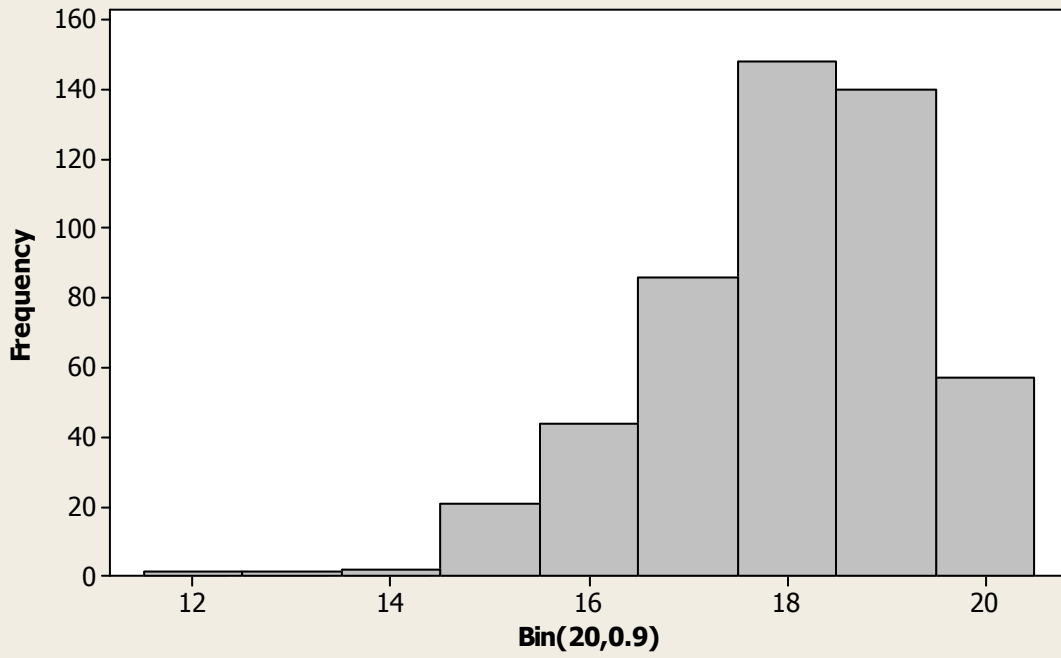
Histogram of Bin(20,0.1)



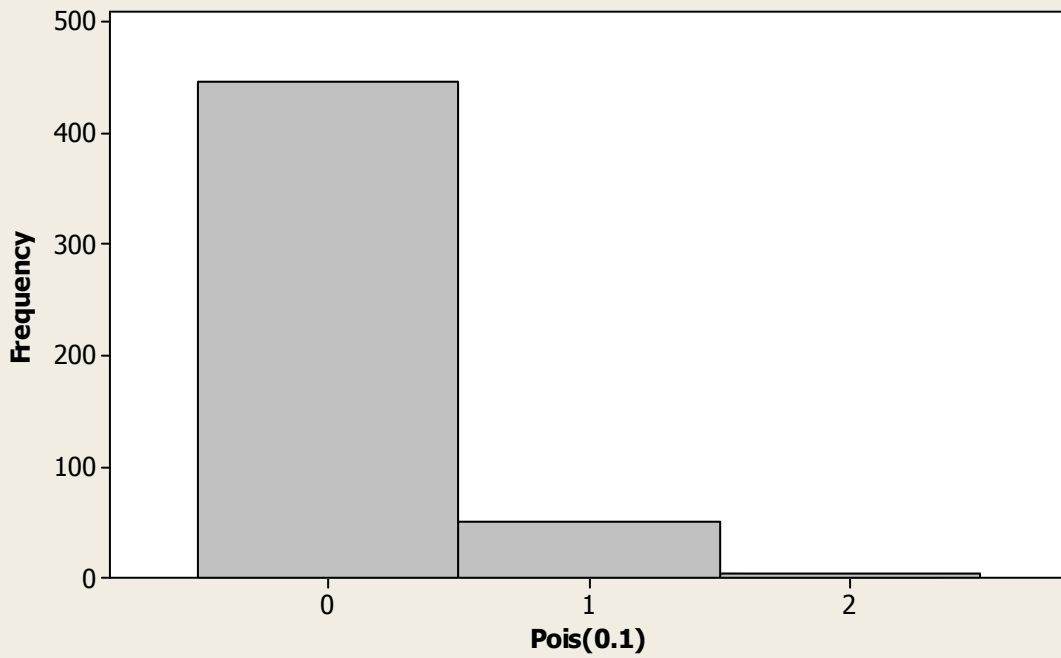
Histogram of Bin(20,0.5)



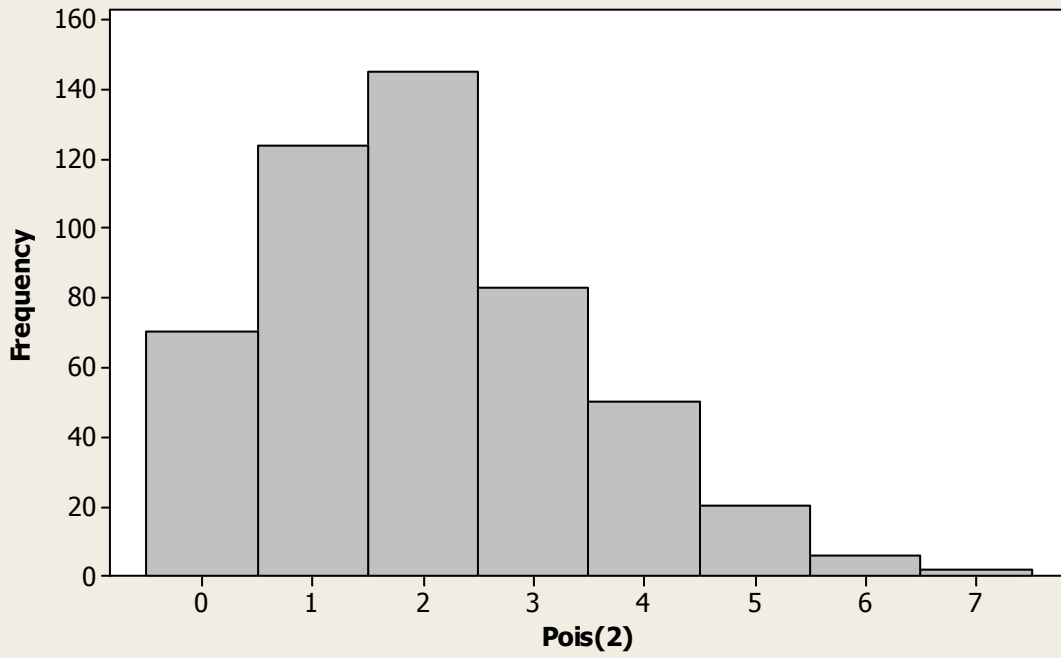
Histogram of Bin(20,0.9)



Histogram of Pois(0.1)



Histogram of Pois(2)



Histogram of Pois(10)

