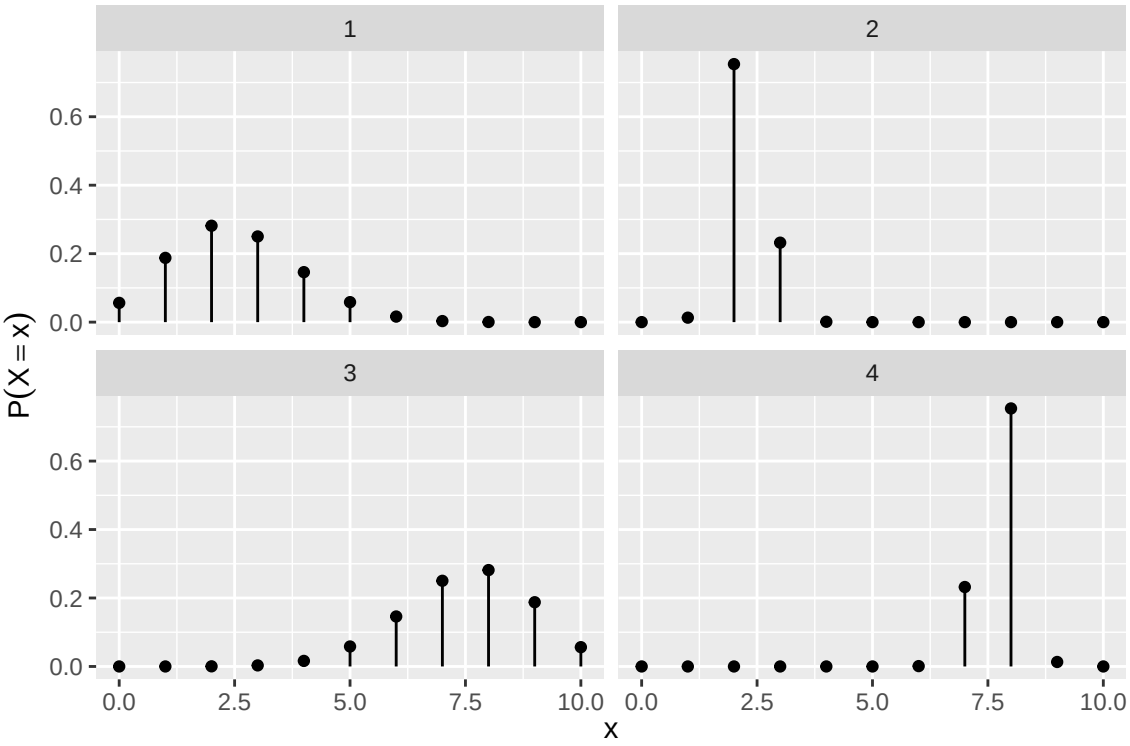
STAT 2857A – Lecture 9 Examples and Exercises

Example 9.1

Compare the mean and variance of the distributions with the following pmfs.



Example 9.2

Approximately 79% of the world's population has brown eyes[1].

Suppose that we sample 5 people from the population at random with replacement and record their eye-colour as brown or not brown. Let X represent the number of people in our sample with brown eyes.

a) Compute the expected value of X.
b) Compute the variance of X.
c) Compute the standard deviation of X.
d) Provide an interpretation for $E(X)$.

Example 9.3

Approximately 79% of the world's population has brown eyes.

Suppose that we sample 5 people from the population at random with replacement and record their eye-colour as brown or not brown. Let Y represent the number of brown eyes in the sample plus the number of hands[2].

a) Compute the expected value of Y.
b) Compute the variance of Y.
c) Compute the standard deviation of Y.
d) Provide an interpretation for $E(Y)$.

Exercise 9.1

A professor driving to Western must pass through 5 sets of traffic lights. There is a .75 percent chance of being stopped at each light (or so it appears to him). The time it takes him to complete the drive is 15 minutes plus 3 minutes for each light he has to stop at.

Let X be the number of lights he must stop at and Y the time it takes him in minutes.

a) Compute the expected value, variance, and standard deviation of X.
b) Provide an interpretation for the expected value.
c) Compute the expected value, variance, and standard deviation of Y.

[1] https://www.worldatlas.com
[2] We'll assume that everyone has two of each