# THE TWELVE DAYS OF STATISTICS KEY

***On the first day of Statistics, my true love gave to me: A Partridge in a Pear Tree.***

If the probability of getting a partridge is 0.58 and the probability of getting a pear tree is 0.76, and these are independent events, find the probability of getting a partridge and a pear tree.

.4408

***On the second day of Statistics, my true love gave to me: Two Turtle Doves.***

If the probability of a female turtle dove is 0.53, find the probability of at least one female turtle dove in the pair.

.7791

$1 - (P(X=0) = 1 - .2209$

***On the third day of Statistics, my true love gave to me: Three French Hens.***

If the probability of a hen truly having French citizenship is 0.81, find the probability of exactly two French hens out of the three.

.3740

$P(X=2) = {}_3C_2 (.81)^2(.19)$

binom PDF

***On the fourth day of Statistics, my true love gave to me: Four Calling Birds.***

If there is an infinite number of calling birds and the probability of a bird actually calling is 0.63, find the probability of finding the first calling bird on the third attempt.

.0862

geom PDF → $P(X=3) = (.37)^2(.63)$

***On the fifth day of Statistics, my true love gave to me: Five Golden Rings.***

If the probability of getting a real golden ring is 0.72, find the probability of getting three or fewer golden rings in the five.

.4303

binom CDF $P(X=3)$

***On the sixth day of Statistics, my true love gave to me: Six Geese A-laying.***

If the probability of an authentic laying goose is 0.83 and there is an unlimited number of geese, find the probability of getting a laying goose on or before the fourth trial.

.9992

geom CDF $P(X \leq 4)$

***On the seventh day of Statistics, my true love gave to me: Seven Swans A-swimming.***

If the probability of a swan drowning is 0.23, find the probability of exactly 4 out of the 7swans drowning.

.0447

BinomPDF $P(X=4)$

***On the eighth day of Statistics, my true love gave to me: Eight Maids A-milking.***

If the probability of getting a sour ~~maid~~ a-milking is 0.38, find the expected number of sour maids a-milking in the group of 8.

3.04

$\mu_x = 8(.38)$

***On the ninth day of Statistics, my true love gave to me: Nine Ladies Dancing.***

If the probability of a dancing lady accepting an invitation to dance is 0.18, find the expected number of ladies you would have to ask before one accepts.

5.556

$\mu_x = 1/.18$

***On the tenth day of Statistics, my true love gave to me: Ten Lords A-leaping.***

If the probability of a lame leaping lord is 0.24 and there is an unlimited number of leaping lords, find the probability of getting your first lame leaping lord after the sixth attempt.

.1927

GeomCDF $P(X>6) = 1 - P(X\leq 6)$

***On the eleventh day of Statistics, my true love gave to me: Eleven Pipers Piping.***

If the probability of frozen pipes is 0.63, find the probability of 8 or more frozen pipes out of the eleven.

.3714

binomCDF $P(X\geq 8) = 1 - P(X\leq 7)$

***On the twelfth day of Statistics, my true love gave to me: Twelve Drummers Drumming.***

If the probability of a dribbling drummer is 0.48, find the standard deviation of the dribbling drummers drumming for twelve drummers drumming.

1.7307

$\sigma = \sqrt{npq} = \sqrt{12(.48)(.52)}$