

StatCrunch Lab 6 for Statistics 301

Topics: discrete probability distributions, expected value, variance, binomial distribution, Poisson distribution

Expected Value, Standard Deviation and Variance.

- Determine the expected value, standard deviation and variance of

number seizures, x	$P(x)$
0	0.17
2	0.21
4	0.18
6	0.11
8	0.16
10	0.17

1. *Graph.* Blank data table. Relabel var1 as seizures, var2 as P(x). Type data into seizures and P(x) columns. Stat, Calculators, Custom, Values in: seizures, Weights in: P(x), Okay.
2. *Expected value, mean μ* Stat, Calculators, Custom, Values in: seizures, Weights in: P(x), Okay. Notice $\mu_X = \text{Mean: } 4.78$.
3. *Standard deviation, SD σ* Stat, Calculators, Custom, Values in: seizures, Weights in: P(x), Okay. Notice $\sigma_X = \text{Std, Dev.: } 3.47$.

Binomial Distribution.

- What is the chance a lawyer will win *exactly* 5 trials in the next 10 trials if she has a chance of 0.4 of winning each trial?

Stat, Calculators, Binomial, n: 10, p: 0.4, Prob(X = 5) Compute. Notice Prob(X = 5) = 0.200.

- What is the chance a lawyer will win *at most* 5 trials in the next 10 trials if she has a chance of 0.4 of winning each trial?

Stat, Calculators, Binomial, n: 10, p: 0.4, Prob(X <= 5) Compute. Notice Prob(X <= 5) = 0.834.

Poisson Probability Distribution.

- What is chance *exactly* 3 particles per microsecond will hit a magnetic detection field if, on average, 1.32 particles hit this field per microsecond?

Stat, Calculators, Poisson, Mean: 1.32, Prob($X = 3$) Compute. Notice $\text{Prob}(X = 3) = 0.102$

- What is chance *at most* 3 particles per microsecond will hit a magnetic detection field if, on average, 1.32 particles hit this field per microsecond?

Stat, Calculators, Poisson, Mean: 1.32, Prob($X \leq 3$) Compute. Notice $\text{Prob}(X \leq 3) = 0.95$