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Probability and Applied Statistics

Dataset = 1.07,-0.75,-0.2,-0.09,-1.06,-1.29,1.67,0.56,0.16,-0.41,1.17,-0.04,1.17,-0.53,1.25,0.73,-0.84,-0.58,-0.06,1.32,1.51,-0.21,-0.8,1.71,1.2,2.28,-0.46,-1.18,-0.47,0.3,0.54,0.14,-0.15,0.56,1.58,-0.86,0.85,-0.17,0.12,0.9,-0.71,1.91,-0.9,-0.03,0.62-0.51,0.18,2.14,-0.85,-0.31,0.89,1.59,0.53,-2.84,0.6,0.24,-0.14,-0.51,-0.25,-1.08,-0.79,-0.89,0.17,-0.84,0.68,-0.23,0.5,0.27,0.05-0.51,-0.82,-0.05,1.7,-0.99,-0.02,0.99,-0.31,0.85,-0.98,-0.78,0,-0.44,-0.07,0.11,-0.64,0.53,-0.3,0.56,0.06,1.04,0.46,0.27,-0.47,-0.86,1.45,-0.59,1.28,0.29,2.0,1.57

3.76

If Y has a geometric distribution with success probability .5, what is the largest value, y0, such that P(Y > y0) ≥ .18?

P(Y > y0) = 1 - P(Y ≤ y0)

P(Y > y0) = 1 - P(Y ≤ y0) = 1 - F(y0) = (1 - p)y0

P= 0.5

(1-0.5)y0≥ 0.18

0.5y0≥0.18

Y0=3

3.123

P(Y=-0.84)=P(Y=0.98)

(e(-λ) \* λ^(-0.84)) / (-0.84)! = (e(-λ) \* λ0.98) / 0.98!

λ(0.98 + 0.84) = (0.98! / (-0.84!)) \* λ(0.98)

λ = (0.98! / (-0.84!))(1/1.02)

λ ≈ 2.4908

P(Y = 2) = (e(-2.4908) \* 2.49082) / 2!

p(2) ≈ 0.2112

3.170

z\_1 = (0.54 - 0.9) / 0.14 = -2.57

z\_2 = (0.56 - 0.9) / 0.14 = -2.14

P(0.54 < X < 0.56) = P(|Z - μ| < 2σ) ≥ 0.75

P(X < 0.56) - P(X < 0.54) ≥ 0.75

P(Z < -2.14) - P(Z < -2.57) ≥ 0.75

P(Z < -2.14) ≈ 0.02

P(Z < -2.57) ≈ 0.01

0.02 - 0.01 ≥ 0.75

0.01 ≥ 0.75

No lower bound

4.39

The probability that her distance to A is more than three times her distance to B can be shown by using the distance formula r=d/t. This is then turned into d>3(2d-d). Probability of her being closer to A is 0.5. 0.5/(1-0). From A 3 times distance to B is 3(1-x).

4x=3

X=0.75

1-0.75= 0.25.

4.149

P(|Y − μ| ≤ 1σ ) = P(|Y − (a+b)/2| ≤ (b-a)/2√3)

P(Y ≤ μ + t) = (μ + t - a)/(b - a), for a ≤ μ + t ≤ b

[(b - a)/√3]/(b - a)

1/√3

???

5.41

P(X = 2) = ∫[P(X = 2 | p) \* f(p)] dp

P(X = 2) = ∫[3p2(1-p) \* f(p)] dp

P(X = 2) = 3/0.91 \* ∫[p2(1-p)] dp

Integration limits .16 – 1.07

P(x=2) = .15