

Continuous Random Variables

Intro to the Normal Curve

Properties of a normal distribution

1. A normal curve is symmetric and bell-shaped
2. A normal curve is completely defined by its mean, μ , and standard deviation, σ
3. The total area under a normal curve equals 1
4. The x-axis is a horizontal asymptote for a normal curve

Properties of a standard normal distribution

1. A normal curve is symmetric and bell-shaped
2. A normal curve is completely defined by its mean, $\mu=0$, and standard deviation, $\sigma=1$
3. The total area under a normal curve equals 1
4. The x-axis is a horizontal asymptote for a normal curve

Normal Distribution

Z-score- can transform any normal random variable into a standard normal random variable

$$Z = \frac{x - \mu}{\sigma}$$

X=data value μ =mean σ =standard deviation

Find the value of z

Example: find the area between $z = -1.67$ and $z = .98$
=normdist(.98)-normdist(-1.67)

Example: Find the value of z where the area between $-z$ and z is .68

1-.68 = .32 = area of both tails
.32 / 2 = .16 the area of one tail
=normsinv(.16)
Finds the z value

Example: find the area to the left of $z = -.28$ and to the right of $z = 1.67$
=normdist(-.28) + (1-normdist(1.67))

Find the value of t

$$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$$

\bar{x} =sample mean μ_0 = population mean s = sample standard deviation n = sample size

Degrees of freedom = n-1 or it will be given

Look up the t value in the table provided, the first column contains the degrees of freedom and the top row has the area of one tail