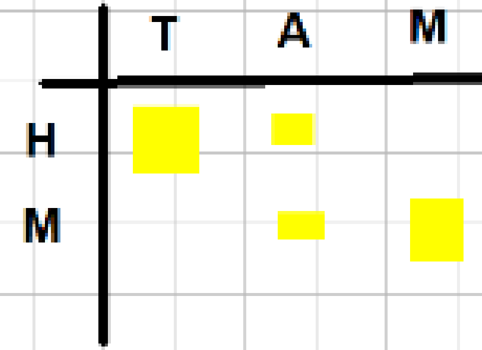
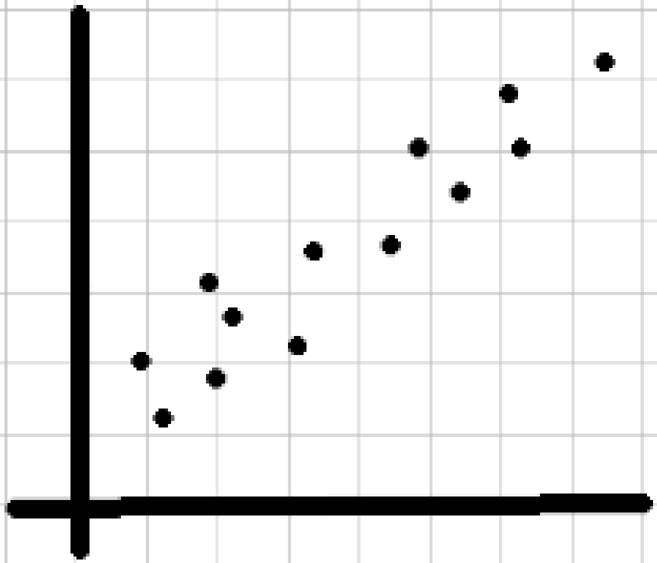
N1 = Sexo = {Hombre, Mujer}

N2 = Marca de carro = {Toyota, Audi, Mercedes}



X1 = Edad

X2 = Peso



Coeficiente de correlación de Pearson

Aqui no seria útil calcular el coeficiente de correlación de Pearson

CASI PERFECTA | FUERTE | MODERADA | POBRE | MODERADA | FUERTE | CASI PERFECTA

-1   -0.9   -0.6   -0.3   0   0.3   0.6   0.9   1

Relación lineal inversa / negativa perfecta

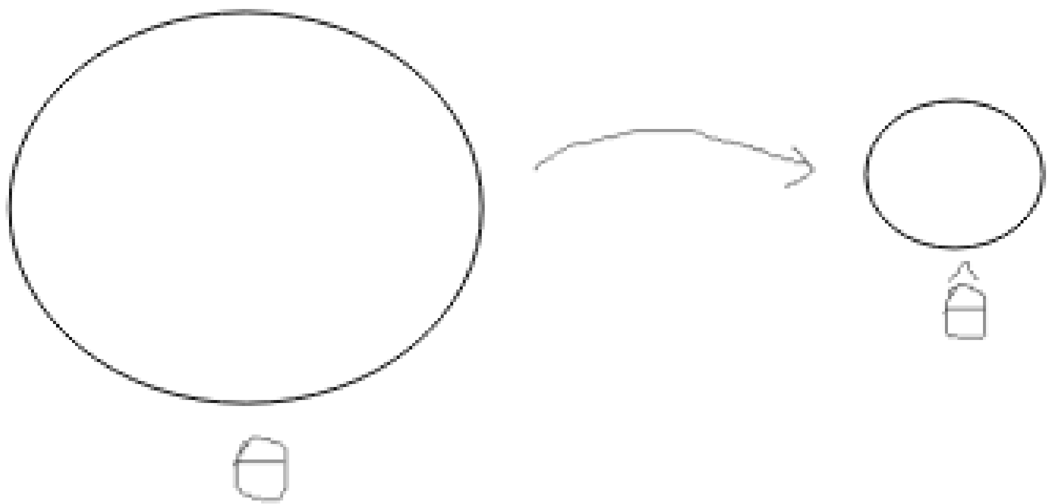
No existe relación lineal

Relación lineal directa / positiva perfecta

$$r = \hat{\rho} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2}\sqrt{\sum_{i=1}^{n}(y_i - \bar{y})^2}} = \frac{cov(x,y)}{d.e.(x) * d.e.(y)}$$

Sin unidades

Intervalos de confianza

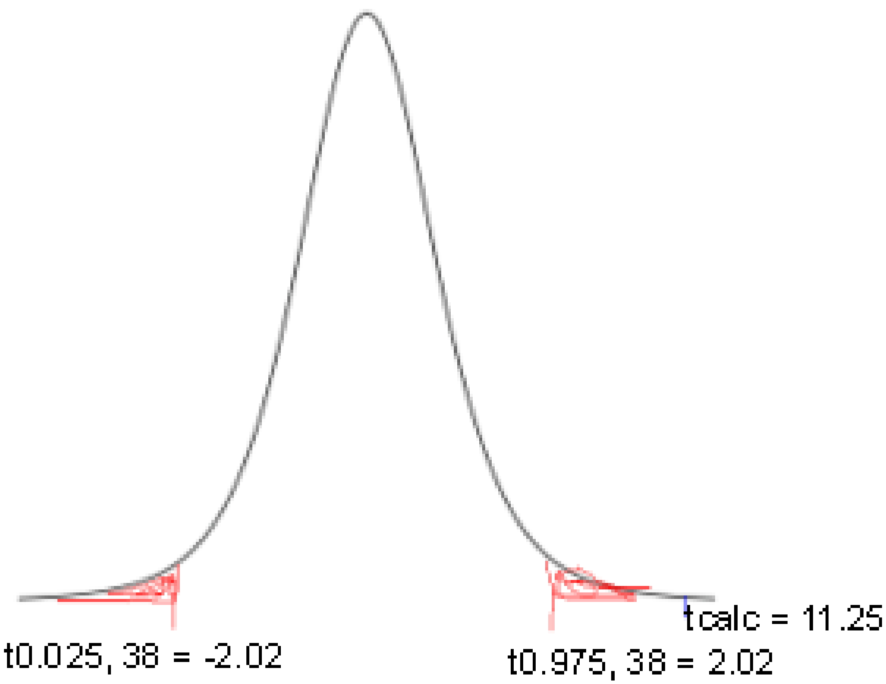


```r
cor.test(x,y, method = "pearson")$conf.int
```

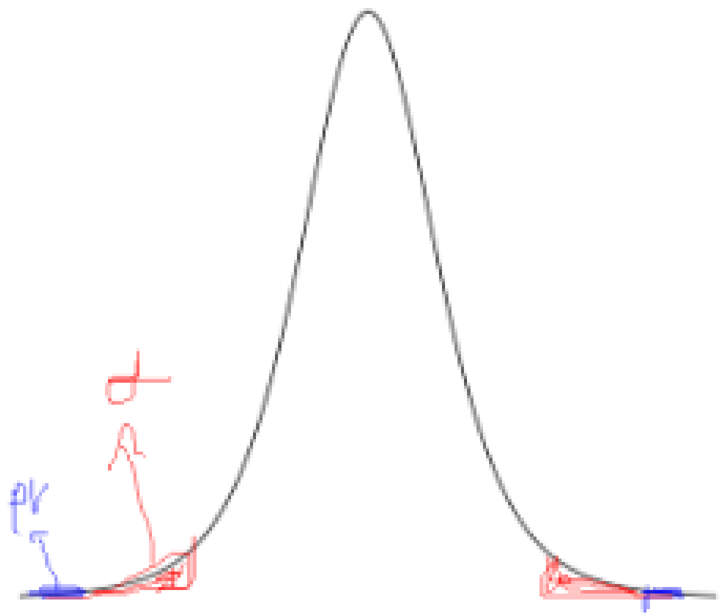
```
[1] 0.7780833 0.9334980
attr(,"conf.level")
[1] 0.95
```

Con un 95% de confiarea , el coeficiente de correlación de Pearson etará contenido en el intervalo (0.778 , 0.933)

Prueba de hipótesis



t calc cae en la zona de rechazo de H0.



pvalor < alfa
Se rechaza H0

$<$

```
> cor.test(x,y, method = "pearson", alternative = "less")

        Pearson's product-moment correlation

data:  x and y
t = 11.253, df = 38, p-value = 1
alternative hypothesis: true correlation is less than 0
95 percent confidence interval:
 -1.000000  0.926505
sample estimates:
      cor
0.8770203
```

$$H_0 : \rho \geq 0$$

$$H_1 : \rho < 0$$

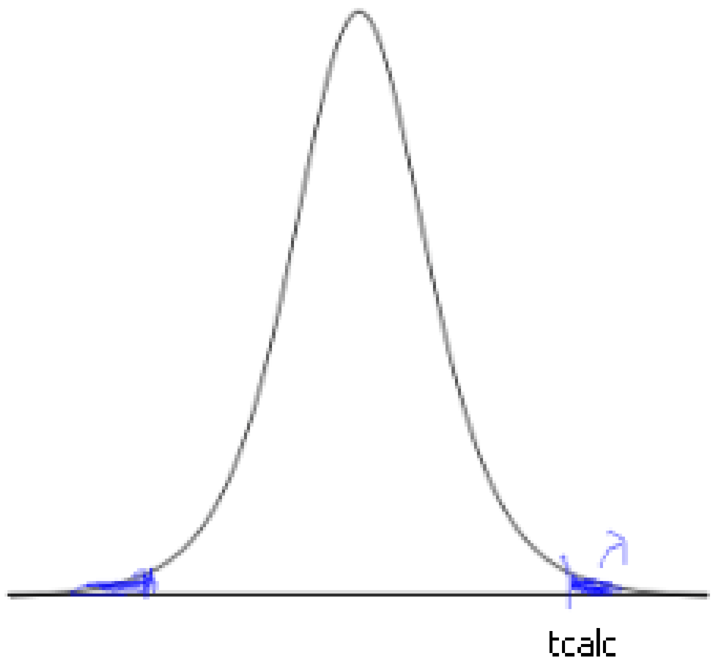
$>$

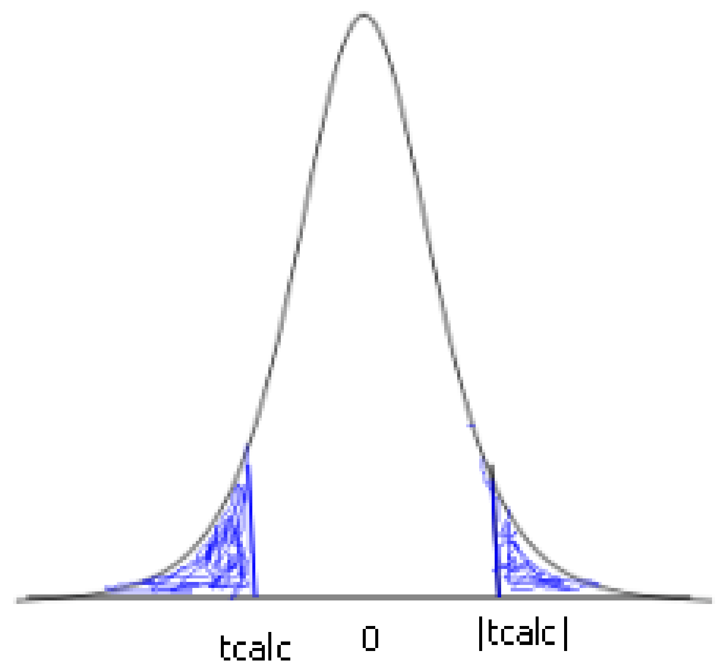
```
> cor.test(x,y, method = "pearson", alternative = "greater")

        Pearson's product-moment correlation

data:  x and y
t = 11.253, df = 38, p-value = 5.817e-14
alternative hypothesis: true correlation is greater than 0
95 percent confidence interval:
 0.7977155 1.0000000
sample estimates:
      cor
0.8770203
```

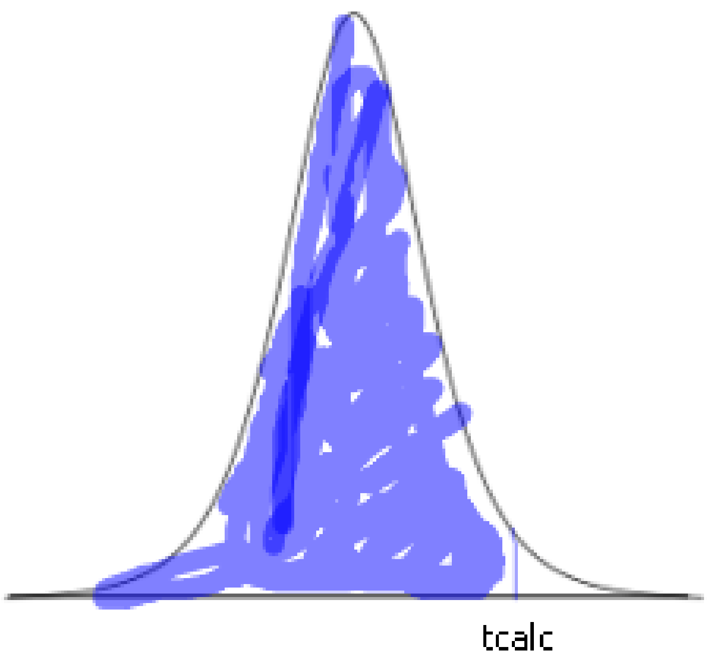
$$H_0 : \rho \leq 0$$

$$H_1 : \rho > 0$$

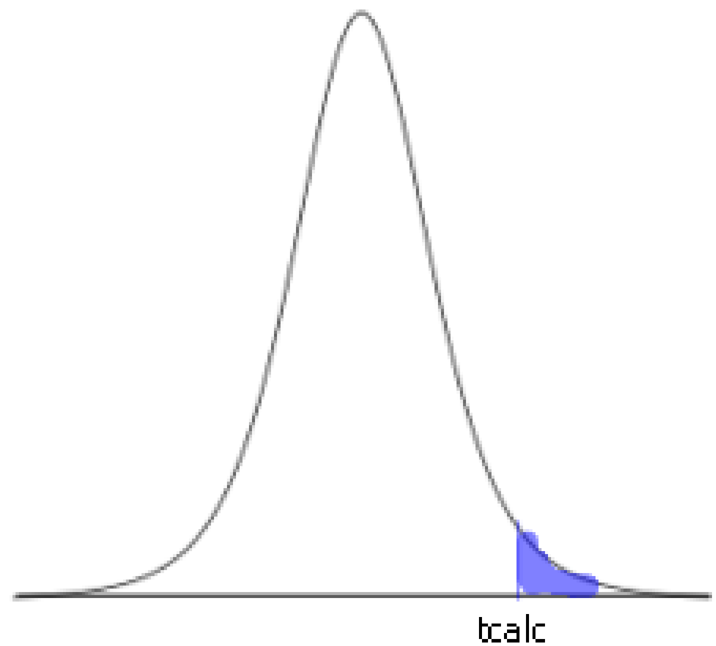
p-valor $= 2P(T_{n-2} > |t_{\text{calc}}|)$







pt(tcalc, df = ...)



pt(tcalc, df = ..., **lower.tail** = **FALSE**)