# Exercis 9 DAT 110

## Exercise 9

### Task 1

In [3]:

```
from scipy.stats import t

def calculate_critical_t(n,CL):
    df = n-1

    critical_t = t.ppf(1-(1-CL)/2, df)
    return critical_t

A = calculate_critical_t(6,0.9)
B = calculate_critical_t(21,0.98)
C =  calculate_critical_t(29,0.95)
D = calculate_critical_t(12,0.99)

print(f'A: {A}, B: {B}, C: {C}, D: {D}')
```

```
A: 2.015048372669157, B: 2.527977002740546, C: 2.048407141795244, D: 3.1058065132211006
```

### Task 2

In [2]:

```
def find_p(n, T):
    df = n - 1

    return 2 * t.sf(abs(T), df)

A = find_p(11,1.91)
B = find_p(17,-3.45)
C = find_p(7, 0.83)
D = find_p(20, 2.13)

print(f'A: {A}, B: {B}, C: {C}, D: {D}')
```

```
A: 0.08520487664515644, B: 0.0032935714037969134, C: 0.43830840156598644, D: 0.0424353859219
```

(3) First I used the scipy t.ppf method to find the critical t = - 2,093

$$\bar{x} = \mu \pm t_{critical} \times \frac{s}{\sqrt{n}}$$

$$\bar{x} = 60 \pm (-2{,}093) \times \frac{8}{\sqrt{20}}$$

lower value = 56,26

upper value = 63,74

The sample mean has to be between these values or will be rejected: