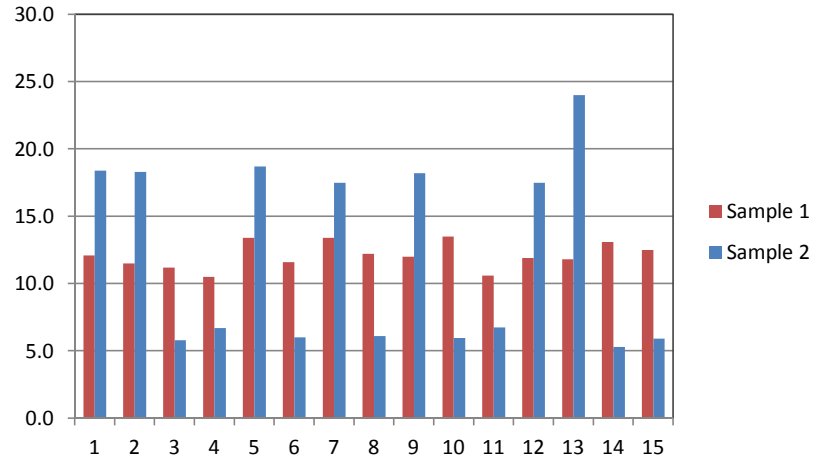
	sample 1				sample 2		
1	12.1	12.09	mean	1	18.4	12.07	mean
2	11.5	0.96	std dev	2	18.3	6.82	
3	11.2	0.25	std error	3	5.8	1.76	std error
4	10.5	2.14	t_.975	4	6.7	2.14	t_.975
5	13.4	11.56	t_a	5	18.7	8.29	t_a
6	11.6	12.62	t_b	6	6.0	15.85	t_b
7	13.4	12	target value	7	17.5	12	target value
8	12.2	-0.350	t	8	6.1	-0.042	t
9	12.0	37%		9	18.2	48%	
10	13.5	63%		10	6.0	52%	
11	10.6			11	6.8		
12	11.9			12	17.5		
13	11.8			13	24.0		
14	13.1			14	5.3		
15	12.5			15	5.9		

The true mean of the population is between t_a and t_b with 95% confidence.

What is the probability that the true mean is less than 12oz?

What is the probability that the true mean is greater than 12oz?



(Finite sample size)

EXAMPLE 3.1 Based on the seven data points we have on Blue Fluid 175 density, what is the probability that the true density of Blue Fluid 175 is less than 1.75 g/cm³?

$$\Pr(\bar{\rho} \le b) = \Pr\left(t \le \left[t_b = \frac{b-\bar{\rho}}{s/\sqrt{n}}\right]\right)$$

$$= T\left(\frac{b-\bar{\rho}}{s/\sqrt{n}}\right)$$

In Excel:

$$T(t) = \begin{cases} t<0 & TDIST(-t,\nu,1) \\ t\ge 0 & 1-TDIST(t,\nu,1) \end{cases}$$

i	X_i	(X_i-mean)^2
1	1.7348	3.26E-04
2	1.7465	4.03E-05
3	1.7359	2.87E-04
4	1.83	5.95E-03
5	1.74688	3.56E-05
6	1.74412	7.62E-05
7	1.73173	4.46E-04
sample mean=	1.752847	
sample std dev=	0.034553	

$b = 1.75$

$t_b = -.22$

$T(t_b) = TDIST(0.22,6,1) = 0.416583$

Answer: 42%

(assuming normal distribution we calculated 41%)