One-Sample t Tests

1. When working properly, a soda machine will dispense soda with a mean of $\mu = 12$ ounces. A quality control engineer is concerned that the machine is over filling the cups. He draws a random sample of 8 cups and records the following amounts:

   | 11.88 | 12.65 | 12.49 | 12.14 | 12.25 | 12.55 | 12.08 | 11.78 |

Is there evidence at the 5% level that the machine is over filling the cups?

P: *State what the **parameter** of interest is representing in this problem.*

H: *State **hypotheses** in words and symbols.*

A: *Verify the **assumptions**/conditions.*

- Random.

- Normal.

- Independent.

N: ***Name** the appropriate inference procedure.*

T: *Carry out the selected procedure. Find the **test statistic**.*

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

O: ***Obtain** the corresponding P-value based on the test statistic and H_a.*

M: ***Make** a decision to reject or fail to reject H_0.*

S: ***State** your conclusion in the context of the problem.*

2. A hospital nurse is conducting a study about sleeping habits of four-year-olds. She wonders if they get more sleep than the recommended 8 hours per night. To test her claim, she collects a simple random sample of 12 four-year-olds and asks their parents how much sleep they got last night. Suppose the distribution of the amount of sleep for all four-year-olds is approximately Normal. The results are given below.

Child	Hrs of sleep
1	9.25
2	8.25
3	6.50
4	8.50
5	7.50
6	9.25
7	9.00
8	8.00
9	8.25
10	9.75
11	10.00
12	9.25

Conduct an appropriate test of significance (at the 10% level) to decide if the data support the nurse's claim that four-year-olds average more than 8 hours of sleep per night.