1. **Problem**
   A machine fills milk into 500ml packages. It is suspected that the machine is not working correctly and that the amount of milk filled differs from the setpoint $\mu_0 = 500$. A sample of 247 packages filled by the machine are collected. The sample mean $\bar{y}$ is equal to 521.3 and the sample variance s^2_{n-1} is equal to 527.08.

   Test the hypothesis that the amount filled corresponds on average to the setpoint. What is the absolute value of the t test statistic?

   Solution
   The t test statistic is calculated by:

$$t = \frac{\bar{y} - \mu_0}{\sqrt{\frac{s^2_{n-1}}{n}}} = \frac{521.3 - 500}{\sqrt{\frac{527.08}{247}}} = 14.581.$$

   The absolute value of the t test statistic is thus equal to 14.581.