Homework Solutions
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Exercise 27

(a) The hypotheses are

$$\begin{aligned} H_0: &\quad \mu_1 = \mu_2 \\ H_1: &\quad \mu_1 \neq \mu_2 \end{aligned}$$

(b) Enter the data into two separate lists in the TI-83 and use `1-Var-Stats` for each list. We obtain $\overline{x}_1 = 37.43$, $s_1 = 3.69$, $\overline{x}_2 = 42.5$, and $s_2 = 3.89$. Next, calculate s_p.

$$\begin{aligned} s_p &= \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}} \\ &= \sqrt{\frac{6 \cdot 3.69^2 + 7 \cdot 3.89^2}{13}} \\ &= 3.80. \end{aligned}$$

Now compute t.

$$\begin{aligned} t &= \frac{(\overline{x}_1 - \overline{x}_2) - 0}{s_p\sqrt{\frac{1}{n_1}+]frac1n_2}} \\ &= \frac{37.43 - 42.5}{3.80\sqrt{\frac{1}{7}+\frac{1}{8}}} \\ &= -\frac{5.07}{1.967} \\ &= -2.578. \end{aligned}$$

The p-value is $2 \times$ `tcdf(-E99,-2.578,13)` $= 0.0229$.

(c) The results are significant at the 0.05 level. That is, reject H_0. This means that the average body weight of Strain 2 rats is greater than the average body weight of Strain 1 rats.

You can get these results on the TI-83 by using `2-SampTTest`.