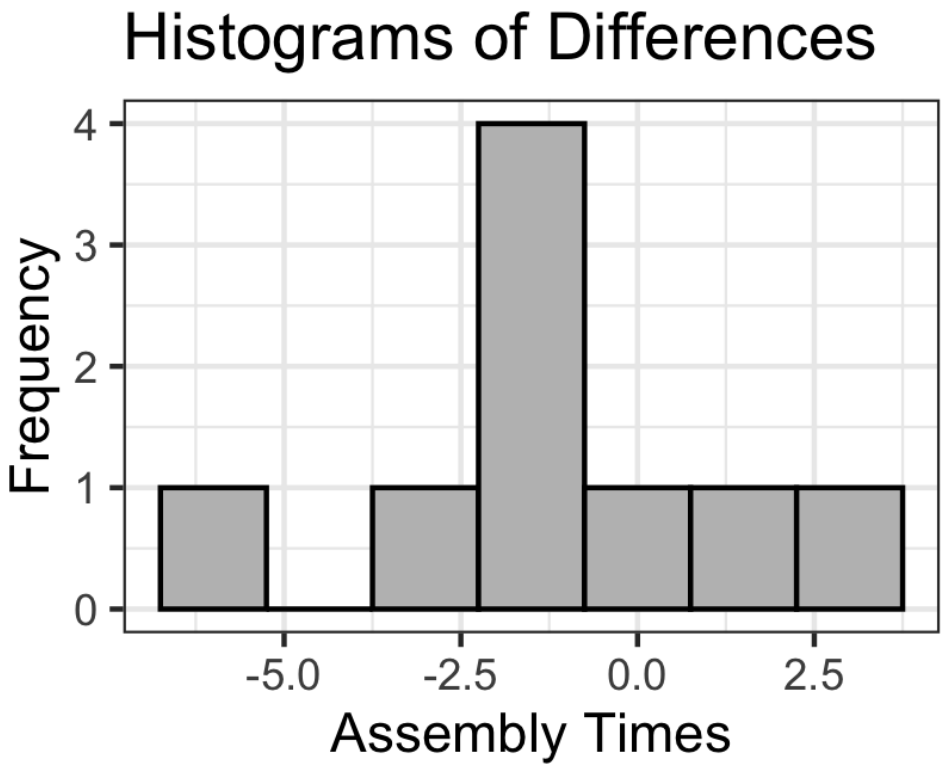
Lesson 12: Inference for Two Means (Paired Data)

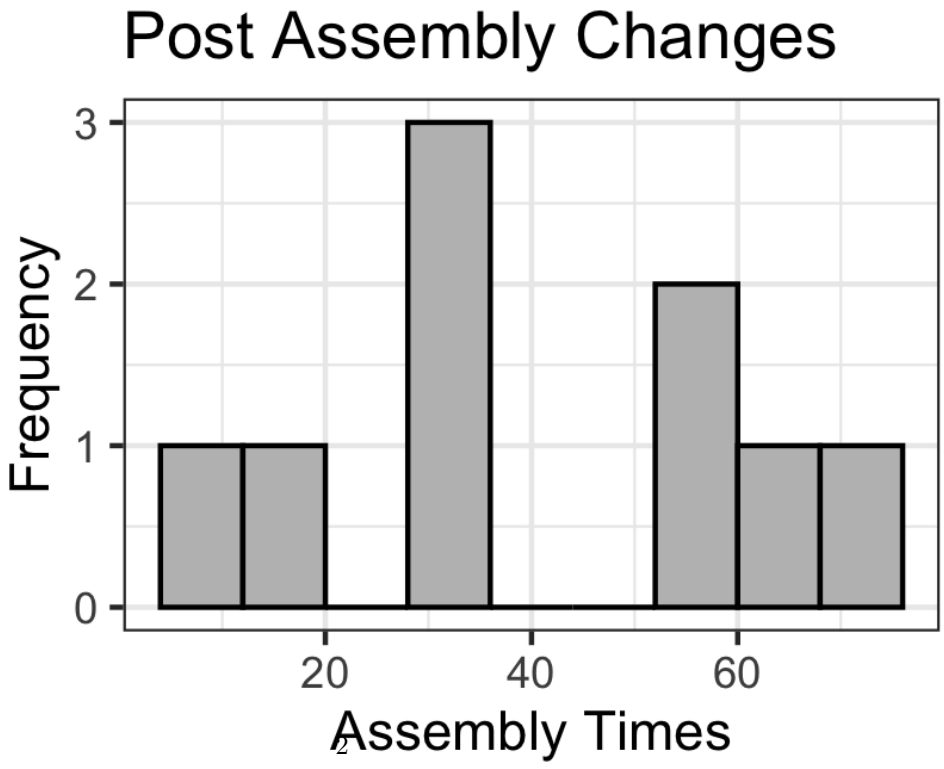
Preparation

Solutions

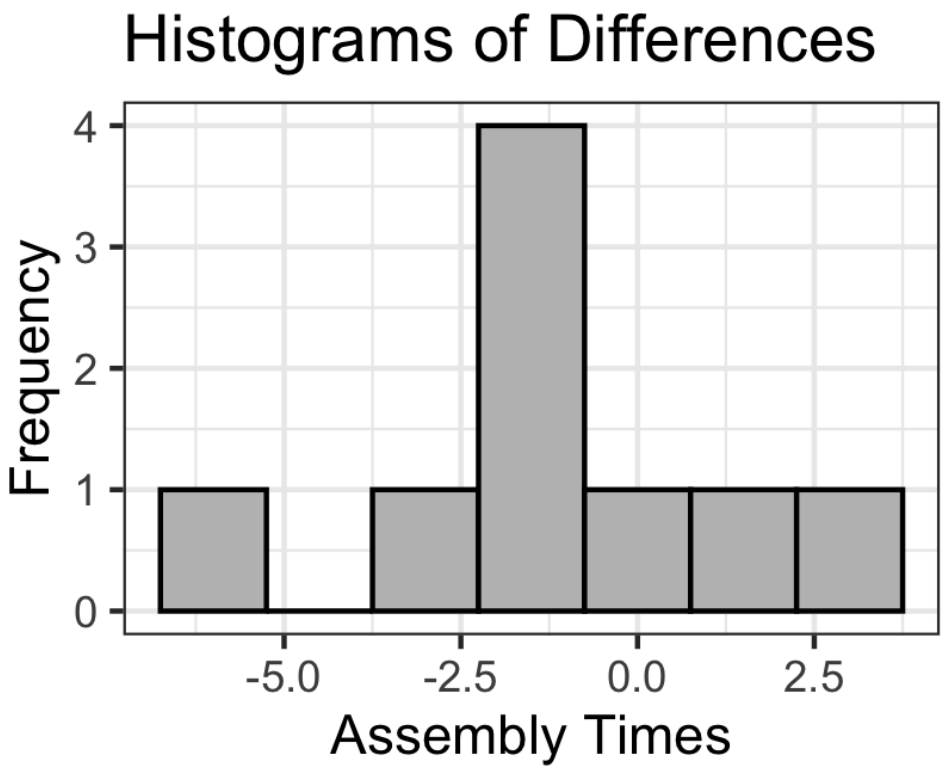
Problem	Part	Solution
1	-	Usually matched pairs are data taken from one population where a pair of observations is drawn on the same individuals selected for the sample, such as a pre-test and post-test.
2	-	open ended
3	A	After implementing the new loading/unloading procedure, is the mean wait time different than the wait time before?
3	B	$H_o : \mu_d = 0$ $H_a : \mu_d \neq 0$
4	-	The researcher collected assembly times (in minutes) from 9 factory workers before the change. Then he collected the assembly times for those same 9 workers after the change in procedure had been implemented.

Problem	Part	Solution
5	-	The paragraph should include: - $\bar{d} = \pm$ 1.056 (depending on difference taken) - $s_d = 2.596$ - $n = 9$ - One histogram of the differences and one histogram for each of the original data sets with clear labl





Pre Assembly Changes

Problem	Part	Solution
6	A	A two tailed paired-sample t-test for means is the appropriate hypothesis test to perform.
6	B	That the sample mean of the differences comes from a normal distribution and we assume a simple random sample of the population.
6	C	We assume a simple random sample of the population. $n < 30$ so we would need to look back at the  The differences may not by normally distributed, it is hard to tell with such a small sample size. We
6	D	$t = 1.22$ or $t = -1.22$
6	E	$df = 8$
6	F	P-value $= 0.257$ P-value $> \alpha$
6	G	P-value $> \alpha$, therefore we fail to reject the null hypothesis the null hypothesis.
6	H	We have insufficient evidence to say that the time to make 100 products is any different after the implementation of the new assembly procedure.
6	I	We would create a 95% confidence interval using the t-distribution. (-0.9397,3.0508) or (-3.0508,0.9397) depending on difference calculated
7	-	You should describe how they need to find another way to reduce the time, because this particular plan did not make a statistically significant difference.