Key

Small-Sample Statistics Activity

Not having access to engine or chassis dynamometers, a person is trying to figure out if a certain engine modification has made an increase in engine power output. They take their car to a drag strip (with timing light accuracy to 0.005 seconds) and make four (4) runs in the original configuration, and four (4) runs with the modification. The results are as follows:

Test Run	1/4 mile time [sec] - unmodified	1/4 mile time [sec] - modified
1	13.65	13.25
2	13.42	13.54
3	13.58	13.35
4	13.37	13.42

1) Calculate the sample mean of the ¼ mile times for each set of data.

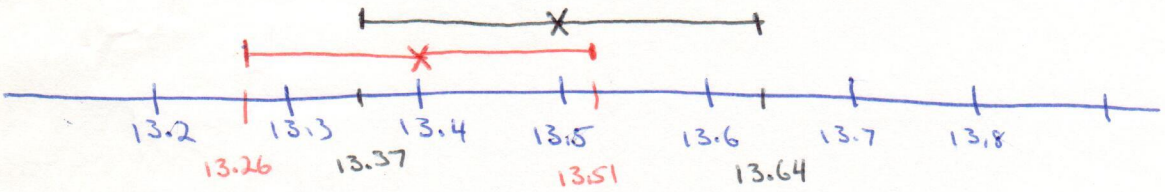
13.505 sec 13.39 sec

2) Do you believe the modification is producing more power? Why?

looks like it is

3) Calculate the sample standard deviation. Plot the mean, and plus/minus one standard deviation for both data sets on the same number line.

0.132 sec 0.122 sec



4) Do you believe the modification is producing more power? Why?

Can't say for sure. Data has much overlap

5) How confident are you (percentage) in your data ranges?

May guess 67%, but we don't have any idea what the probability of our range is. Or, we don't know range for given probability

6) Identify three issues for and against the modifications effect

- mean times are lower
- lowest time lower when modified
- high time lower than ½ unmodified runs

* Change in conditions?
* Power ↑, or other factor on times?
* Improvement w/ practice?