1. A closer examination of the records of air samples in Exercise 3 Homework 5 reveals that each line of data actually represents reading on the same day: 2.02 and 1.84 are on day one, and so forth. Does this affect the validity of the results obtained? If so reanalyze.
2. In a test of the effectiveness of a device that is supposed to increase gasoline mileage in automobiles, 12 cars were run, in random order, over a prescribed course both with and without the device in random order. The mileages (mph) are given in the following table. Is there evidence that the device is effective?

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Car no. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| With Device | 21.0 | 30.0 | 29.8 | 27.3 | 27.7 | 33.1 | 18.8 | 26.2 | 28.0 | 18.9 | 29.3 | 21.0 |
| Without Device | 20.6 | 29.9 | 30.7 | 26.5 | 26.7 | 32.8 | 21.7 | 28.2 | 28.9 | 19.9 | 32.4 | 22.0 |

1. An engineer was comparing the output from two different processes by independently sampling each one. From process A he took a sample of 64, which yielded a sample mean of 12.5. Process A has known SD of 2.1. From process B he took a sample of 100, which yielded a sample mean of 11.9. Process B has known SD of 2.2. At α = 0.05 would the engineer conclude that both processes had the same average output?
2. The following weights in ounces resulted from a sample of laboratory rats on a particular diet. Use α =0.05 and test whether the diet was effective in reducing weight.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Rat | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Before | 14 | 27 | 19 | 17 | 19 | 12 | 15 | 15 | 21 | 19 |
| After | 16 | 18 | 17 | 16 | 16 | 11 | 15 | 12 | 21 | 18 |