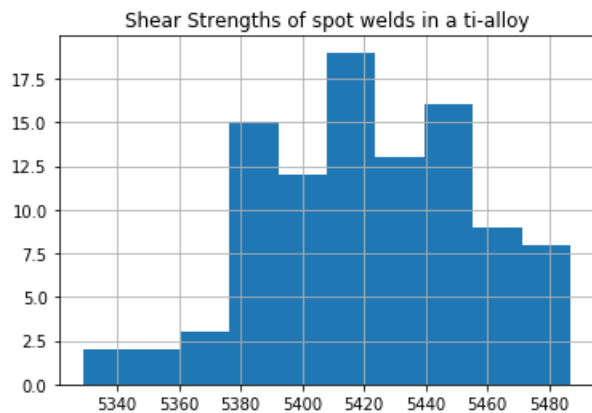


Python 3.6.5 |Anaconda, Inc.| (default, Mar 29 2018, 13:32:41) [MSC v.1900 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 6.4.0 -- An enhanced Interactive Python.

```
In [1]: runfile('C:/Users/hoops/OneDrive/Documents/School/ME EN 2550 Statistics and  
Probability/HW4/HW4.py', wdir='C:/Users/hoops/OneDrive/Documents/School/ME EN 2550  
Statistics and Probability/HW4')
```

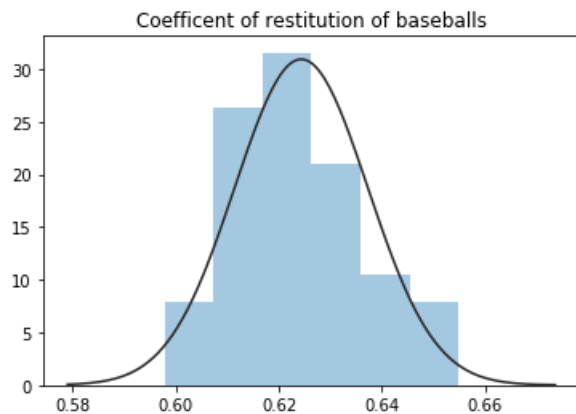
B-1:

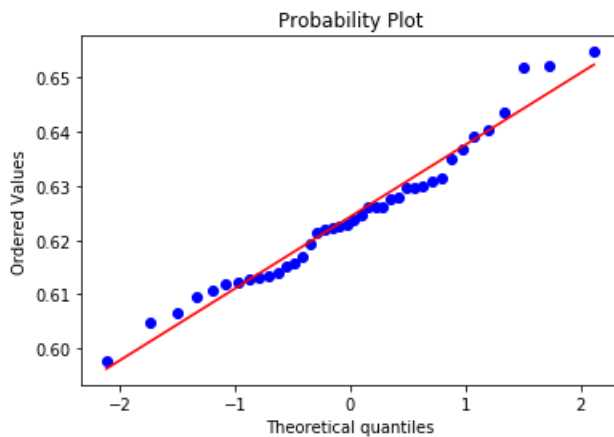


The histogram appears to be almost normally distributed but overall does have left skew(Once we disregard the single outlier)

The 95th percentile of strength is 5477.4

B-2:

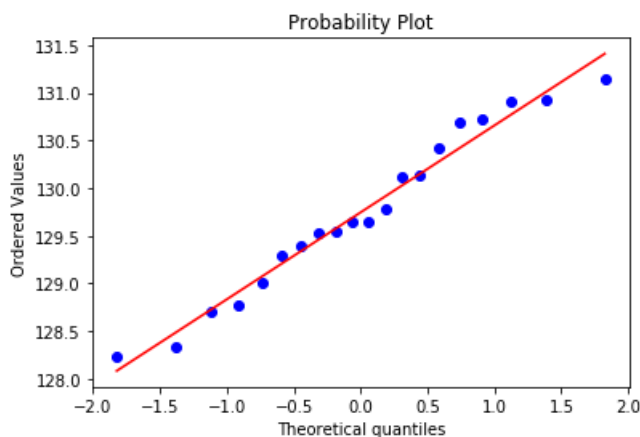
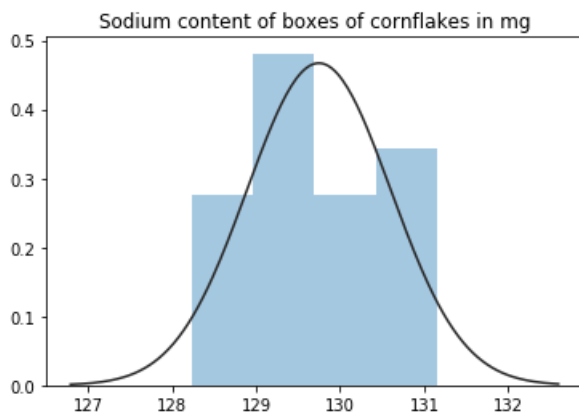




- a) Yes there is evidence that the coefficient of restitution is normally distributed since a normal curve roughly approximates the histogram and a probability plot is roughly linear
- b) A 95% confidence interval for the mean coefficient of restitution is (0.6202905446884502, 0.6283844553115497)
- 0.01305901177201164
- c) A 99% confidence interval for the standard deviation of the coefficient of restitution is (0.010078664067433333, 0.018237801631121764)

B-3:

- a) Using the sample data to conduct a two sided z-test for means against the null hypothesis of a mean of 130mg we get a P-value of: 0.197 and since $0.197 > .05$ at the 95% confidence level we cannot reject the null hypothesis



- b) We can see that the data is approximately normal by fitting a normal curve to the data above and a probability plot is roughly linear
- c) The power of the test if the true mean is 130.5 mg is 0.9536982910711067
- d) The sample size to detect a true mean of 130.1 mg and have power of at least .75 is: 44.738508557490775 (rounded up: 45.0)

In [2]: