Story Name: Acorn Size Oak Distribution
Story Topics: Nature , Geography
Datafile Name: Acorns
Methods: Correlation , Regression , Transformation , Outlier , ANCOVA
Abstract: Fifty species of oak trees grow in the United States. Twenty eight species of oak from the Atlantic region and 11 from the California region were studied. The size of each species' acorns was measured to see whether acorn size is related to geographic range. It is suggested that a plant's seed size may have an effect on the geographic range of the plant because larger acorns can be carried away by larger animals who in turn have a wider territorial range. Acorn size is expressed as a volume computed from measurements of length and width used to estimate an ellipsoidal volume.

We seek an association between acorn size and geographic area, but both variables are skewed and benefit from transformation. After transforming, a scatterplot of area vs acorn size shows different trends for Atlantic and California oaks.

One California species is an outlier in some analyses. This is the tree, *Quercus tomentella Engelm*, which is the only species of oak that grows on an island (Guadalupe), and not on the continent, and thus has its possible range restricted.

Image: Scatterplot of Log(Acorn Size) by Range. The two regions are color coded and symbol coded.

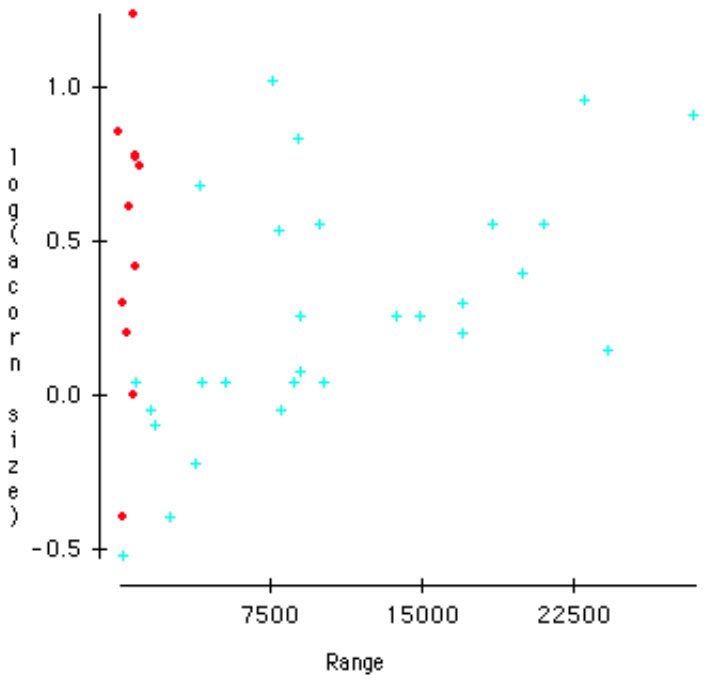
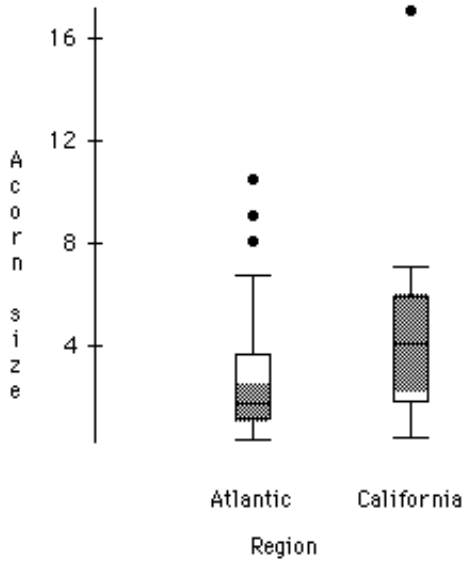


Image: A boxplot of Acorn Size by the two regions.


16
12
8
4
Acorn size
Atlantic
California
Region