

Are temperatures of one year significantly correlated with the next year (successive years), across years in a given location?

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1 Introduction

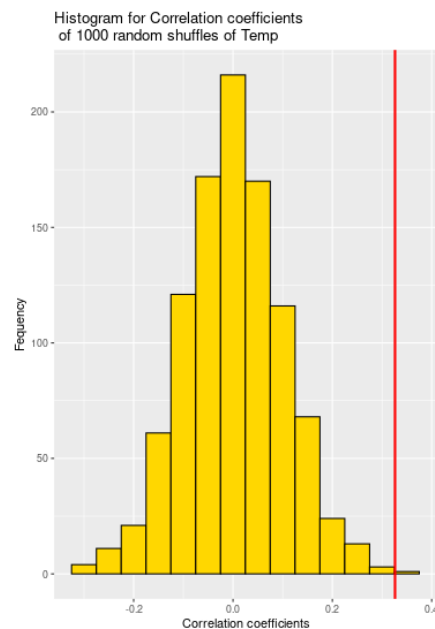
For our TAutoCor piratical we were given a data set, KeyWestAnnualMeanTemperature (KWAMT), which contained time and temperature data for Florida. From this data set wanted to find out the correlation coefficient of temperature between years. However, due to the variables not being independent of one another this means a correlation coefficient will be mathematically correct but not statistically correct, because of this we had to manufacture a new waay of calculating the p value.

2 Method

To allow us to see if there is a significant correlation of temperature between years we need to find out what the probability the the pattern being shown in ?? is being produced by random chance. Therefore, we looked at temperature for sucessive years and looked at the correlation coefficient then shuffled the temperature so they weren't with their successive year and ran a correlation on the new data set. This was repeated 1000 times.

3 Results

Once we had run the simulation 1000 times and collected the correlation coefficients we were able to compare out original datas correlation coefficient. This was done by summing up all of the coefficients that were greater then our original datas correlation coefficient, this came out as 0 giving us a p-value = 0. In 1a we can clearly see the distributions of coefficients with our original data ceofficient indicated by the red line.



(a) Histogram showing distribution of Correlation Coefficients

4 Conclusion

From our results we can see our original data is significantly different from random ($p=0$) telling us that Florida is getting hotter.