Project Title: Trends in Aflatoxin levels in Peanuts in Southwest Georgia relative to Temperature and Rainfall over time

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Project Description/Outline: Aflatoxin is a naturally occurring carcinogen produced by a soil fungus that grows on peanuts. FDA regulations dictate the amount of aflatoxin that is permitted in peanuts that enter the edibles market. The amount of aflatoxin found in peanuts varies year to year based on changes in the weather.

Research Questions: We intend to look at how yearly weather variations impact the amounts of aflatoxin found in raw peanuts before they enter the edible market. What are the relative rates of peanuts meeting regulatory requirements vs. failing regulatory requirements on a year to year basis? Do peanuts typically meet/fail regulatory requirements on the first analysis or on subsequent analyses? In years where the relative failure rates were high, could weather have been a factor? Does rainfall or temperature appear to have a higher impact? Humidity? Cloud cover?

Datasets to be used: USDA aflatoxin dataset, openweather api

Rough breakdown of tasks: get authorization to use the USDA dataset, get and clean the aflatoxin data (removing customer specific information), get weather data for the southwest Georgia region

Technical breakdown of peanut data

FDA Regulations as follows:

* Maximum threshold of 15ppb
* 1st analysis
  + <= 8ppb pass
  + >= 9 and <= 45 second analysis required
  + => 46 fails requirements for human consumption
* 2 analysis
  + 1st + 2nd analysis avg <= 12 pass
  + 1st + 2nd analysis avg >= 13 and <= 23 third analysis required
  + >23 fails requirements for human consumption
* 3 analysis
  + 1st + 2nd + 3rd analysis avg <= 15 pass
  + > 15 fails requirements for human consumption