

## PROBLEM STATEMENT

**Goal:** Compare different methods of calculating market opportunity at the state level for BASF's different crop productions

**What is opportunity?** The potential increase in market share that BASF can have compared to its competitors

### The Problem:

We have national sales numbers for all agriculture companies but only state level information for BASF.

We want to find a way to correlate the National Opportunity Average at the state level, so that BASF can increase its Market Share from the state level itself.

## METHODS AND DATA

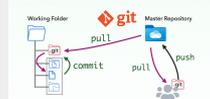
**Azure Databricks** - Used for cloud-based data engineering tool for team's processing and analysis of massive database and allowed team to process data for substantial use of Machine Learning algorithms.

**Language/Library Used:** Pandas, Python

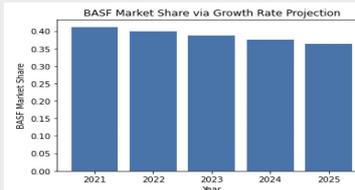
**Data Source:** Provided by BASF's internal data

### Methods Used:

Growth rate (Ratios)  
Bayes Classifier (Machine Learning)

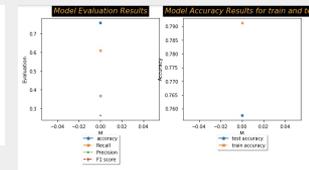


## ADVANCED ANALYTICS

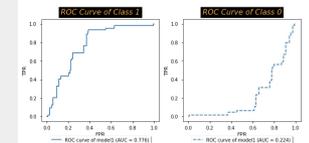


**GROWTH RATE:** Comparing the Market Shares at a state level (Indiana Corn Inoculant) we can see that BASF dominance in market is decreasing

State: MA  
Crop: SOYBEANS  
Indication: Insecticides  
Product Category: Color/Coating  
Mixture: SAF-SAN  
Market share less than 18.37648539835242



**BAYES CLASSIFIER:** Taking the following variable {state, crop, indication, product\_category, mixture, market\_share} we were able to identify the likelihood for BASF to increase its market share with a 76% accuracy score

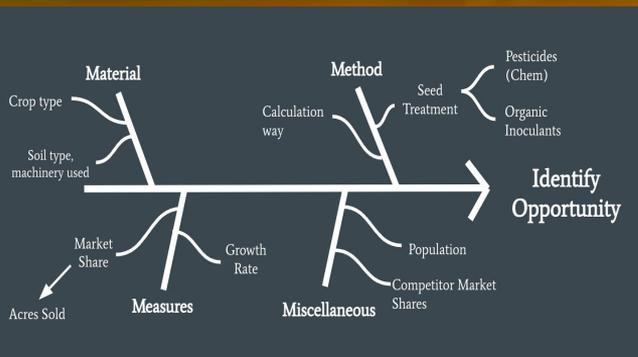


## NEXT STEPS

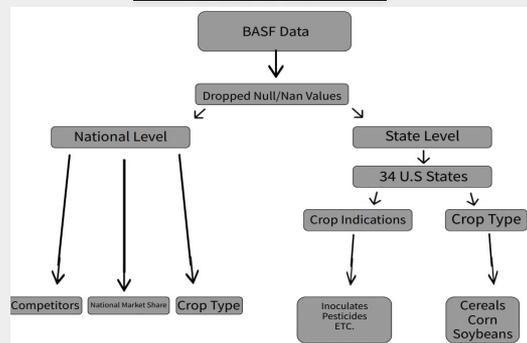
**Advanced Machine Learning and Statistics:** Optimize the bayes model and integrate more variable data to make it self learning of the market.

**Targeted Growth:** Divide the data to regions so that better business intelligence methods can be applied and growth be visualized.

**Build Dashboard:** Create an interactive dashboard for the end user to get insights.



## DATA-SPECIFIC CLEANING



National data frame - to gather information for BASF and our competitors to make assumptions on a state level.  
State data frame - to apply the algorithms and divide the crop type and seed treatment

## Descriptive Analytics

The pie charts show an example of BASF's presence in the state of Iowa based on soybeans od seed type colorant. We see that BASF is not dominant in this category and that we could possibly increase market share here.

