Capstone I Proposal – Chun Wu

Motivating Question

Which completions technique(s) increased the production of oil? After 5 years in the industry, I have heard many thoughts, theories and wild wife's tales about how to improve production. Engineers tend to look at data to try to explain certain results and Operations tend to go off wild thoughts and illogical comparisons. Even with today's technology it is still near impossible for someone to know what is happening 2 miles down and 2 miles across during hydraulic fracturing operations.

The Data

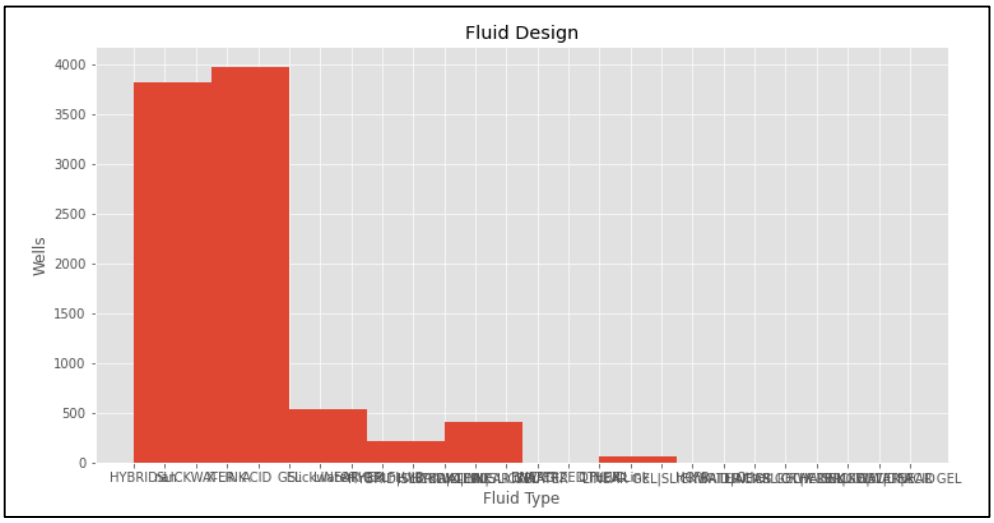
To answer the question, a dataset from Liberty Oilfield Services was acquired which contains production at 30, 60, 90, 180, and 365 days; moreover, the data set contains some important completion data such as fluid systems, proppant totals, proppant types and other oil well basic information such as API. Number, latitude and longitude.

The dataset contains 219 columns, some columns have been mentioned above, and has 9,074 rows. The dataset is for Colorado and the field is the Denver Julesburg Basin (DJ Basin) with wells in the Niobrara, Codell, Greenhorn, and Sussex. The dataset does have some missing data due to poor reporting or to the time factor. Some wells may not have reached the state mandatory reporting time of 30, 60, 90, 180, and 365 days. Proppant types may be missing but having the overall weight may have been reported. Breaking down the fluid system may be a bit delicate due to problem occurring during completion operations.

MVP for Capstone I

Perform EDA on the dataset

- Identify the best producing formation in the DJ Basin.
- Production correlation with proppant volume.
- Isolate the fluid design in the dataset.



MVP+, MVP++

- Bayesian Hypothesis testing.
- Compare fluid design: Slickwater vs. Gel vs. Hybrid.