

## FEATURE TOOLS

Featuretools is an open source library for performing automated feature engineering. It is a great tool designed to fast-forward the feature generation process.

### Implementation of Feature tools

**Entity:** can be considered as a representation of a Pandas DataFrame

**Entity Set:** A collection of multiple entities

**Base Entity:** Loan Details

**Child Entity:** Borrowers Details

### Manual Feature Engineering:

#### OLS Regression Results

```
=====
Dep. Variable:          int_rate    R-squared:                0.947
Model:                  OLS         Adj. R-squared:           0.947
Method:                 Least Squares   F-statistic:            2.570e+04
Date:                  Fri, 22 Mar 2019   Prob (F-statistic):      0.00
Time:                  01:56:33         Log-Likelihood:         -1.3046e+05
No. Observations:      118449          AIC:                   2.611e+05
Df Residuals:          118366          BIC:                   2.619e+05
Df Model:              82
Covariance Type:       nonrobust
```

### Automated Feature Engineering:

#### OLS Regression Results

```
=====
Dep. Variable:          int_rate    R-squared:                0.967
Model:                  OLS         Adj. R-squared:           0.967
Method:                 Least Squares   F-statistic:            2.180e+05
Date:                  Fri, 22 Mar 2019   Prob (F-statistic):      0.00
Time:                  01:47:59         Log-Likelihood:         -1.0190e+05
No. Observations:      118449          AIC:                   2.038e+05
Df Residuals:          118432          BIC:                   2.040e+05
Df Model:              16
Covariance Type:       nonrobust
```

### CONCLUSION:

Process	Mape	Adjusted Squared R value
Manual Feature Engineering	~3.5	94.7%
Automated Feature Engineering(FeatureTools)	~3.5	96.7%