# Feature Engineering: Transformation

Sometimes a polynomial relationship with features is a better fit.

linear $y = ax + b$

quadratic $y = a_2 x^2 + a_1 x + c$

Numerical feature - can do polynomial transformation

scikit-learn

sklearn.preprocessing.PolynomialFeatures

Considerations:

Be aware of overfitting if the degree is too high

Consider non-polynomial transformations as well

For example

Log Transforms

Sigmoid Transforms

Risk of extrapolation beyond the range of the data when using polynomial transformations

- bad overfitting beyond the range of the data

Radial Basis Function → transforming data through a center c

- Transform: $f(x) = f(\|x - c\|)$
- Widely used in Support Vector Machine as a kernel and in Radial Basis Neural Networks (RBNN)
- Guassian RBF is the most common RBF