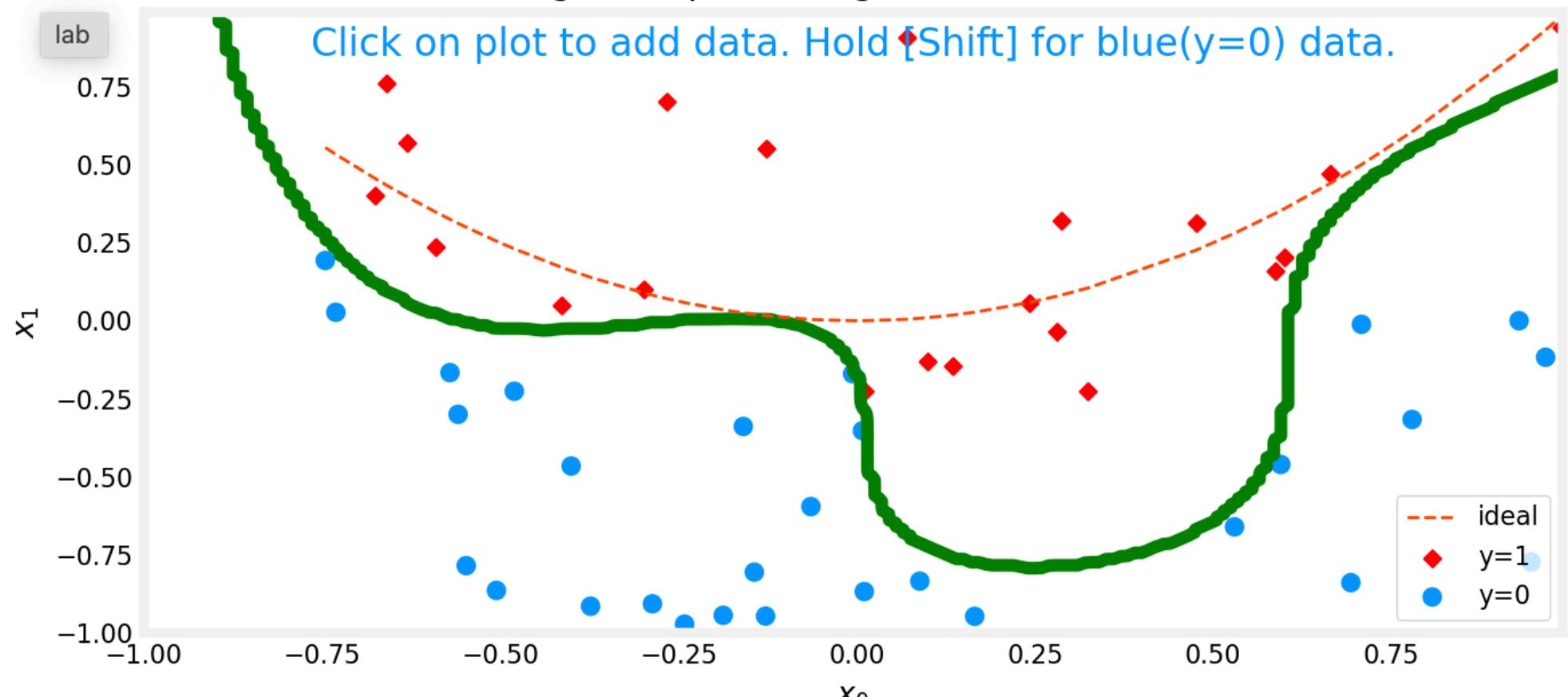


## OverFitting Example: Categorical data set with noise



$$f_{wb} = \text{sigmoid}(w_0x_0 + w_1x_1 + w_2x_0^2 + w_3x_0x_1 + w_4x_1^2 + w_5x_0^3 + w_6x_0^2x_1 + w_7x_0x_1^2 + w_8x_1^3 + w_9x_0^4 + w_{10}x_0^3x_1 + w_{11}x_0^2x_1^2 + w_{12}x_0x_1^3 + w_{13}x_1^4 + w_{14}x_0^5 + w_{15}x_0^4x_1 + w_{16}x_0^3x_1^2 + w_{17}x_0^2x_1^3 + w_{18}x_0x_1^4 + w_{19}x_1^5 + w_{20}x_0^6 + w_{21}x_0^5x_1 + w_{22}x_0^4x_1^2 + w_{23}x_0^3x_1^3 + w_{24}x_0^2x_1^4 + w_{25}x_0x_1^5 + w_{26}x_1^6 + b)$$

Degree

- 1
- 2
- 3
- 4
- 5
- 6

fit data

- Regression
- Categorical

lambda( $\lambda$ )

- 0.0
- 0.2
- 0.4
- 0.6
- 0.8
- 1