Modelos de regresión y AutoML

Equipo Innovación Copec

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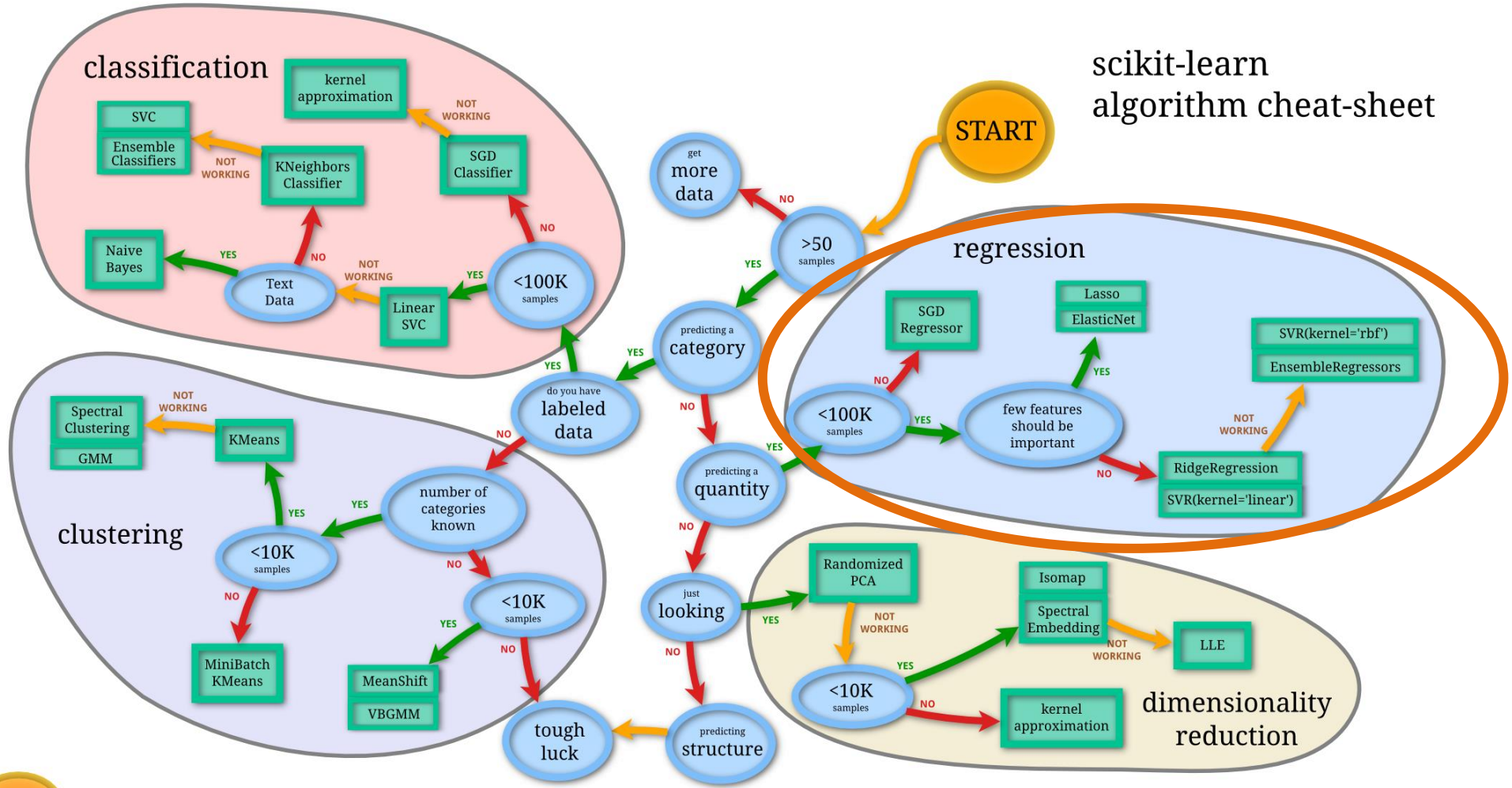
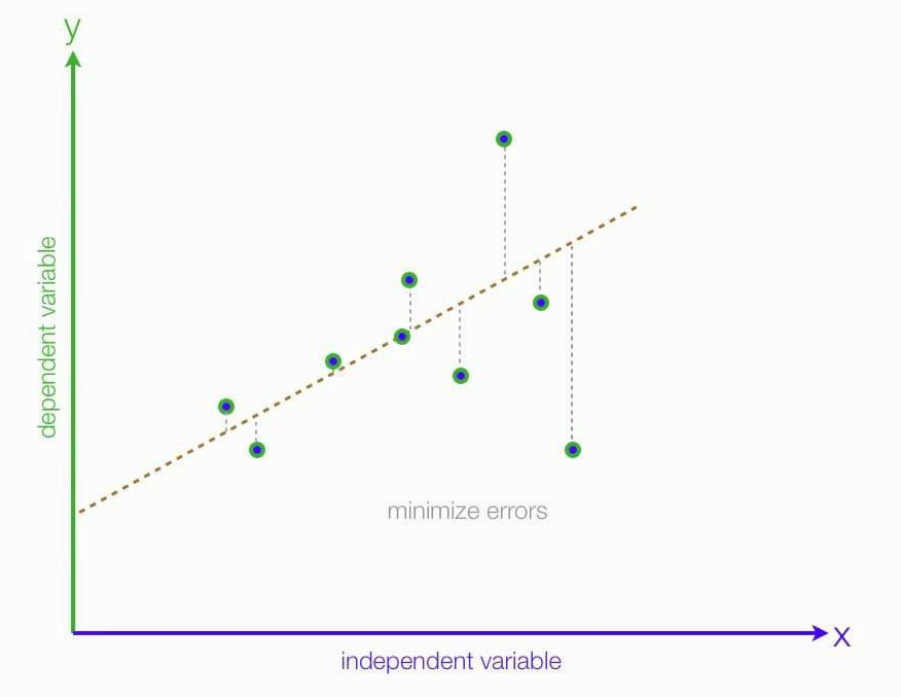
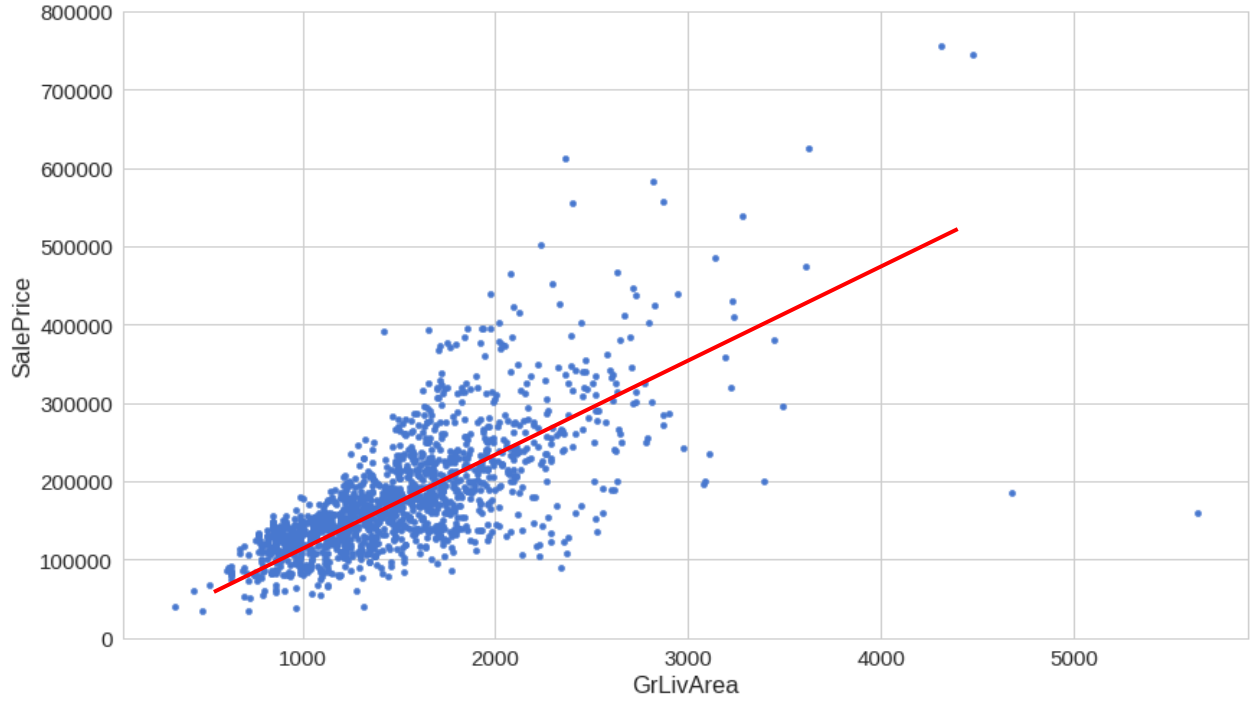
Modelos de regresión

Scikit-learn methods

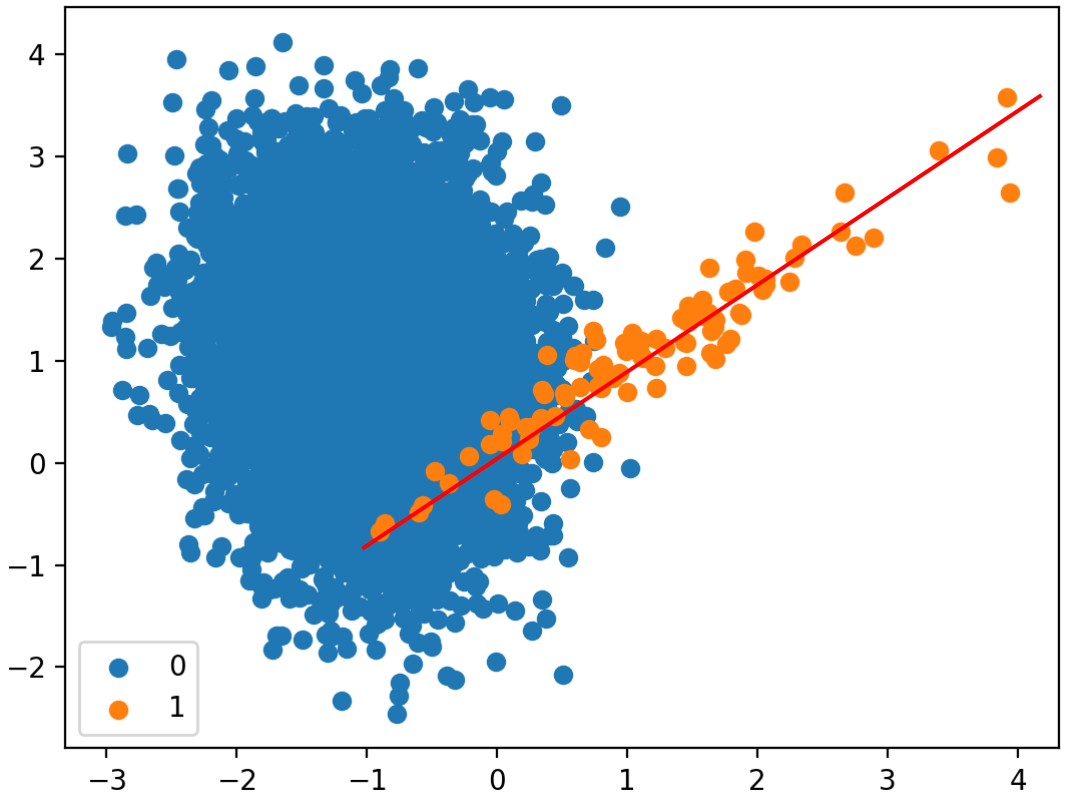


Regresión lineal





Clustering y Regresión



1. Preparar y normalizar datos
2. Hacer clustering (K-means)
3. Identificar clusters de interés y ajustar modelo regresión (LinearRegression)

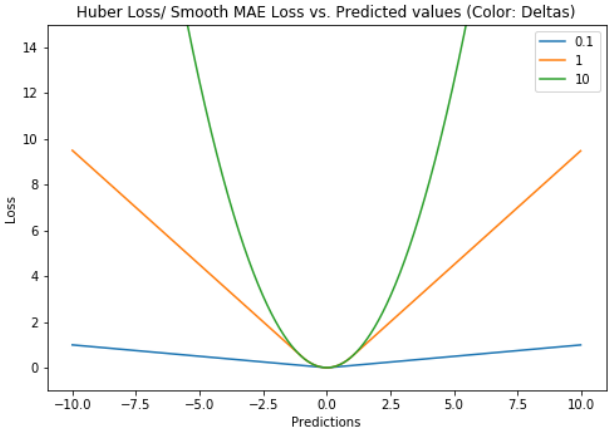
Métricas de evaluación – Modelos de regresión

- Mean Square Error (MSE) L2

$$MSE = \frac{\sum_{i=1}^{n} (y_i - y_i^p)^2}{n}$$

- Mean Absolute Error (MAE) L1

$$MAE = \frac{\sum_{i=1}^{n} |y_i - y_i^p|}{n}$$

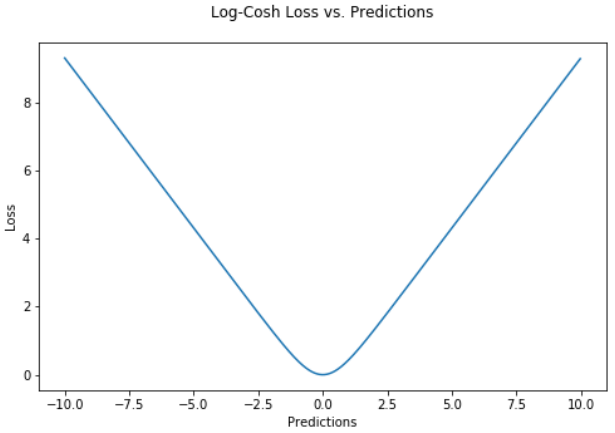


- Huber loss, Smooth Mean Absolute Error

$$L_\delta(y, f(x)) = \begin{cases} \frac{1}{2}(y - f(x))^2 & \text{for} |y - f(x)| \le \delta, \\ \delta |y - f(x)| - \frac{1}{2}\delta^2 & \text{otherwise.} \end{cases}$$

- Log-Cosh loss

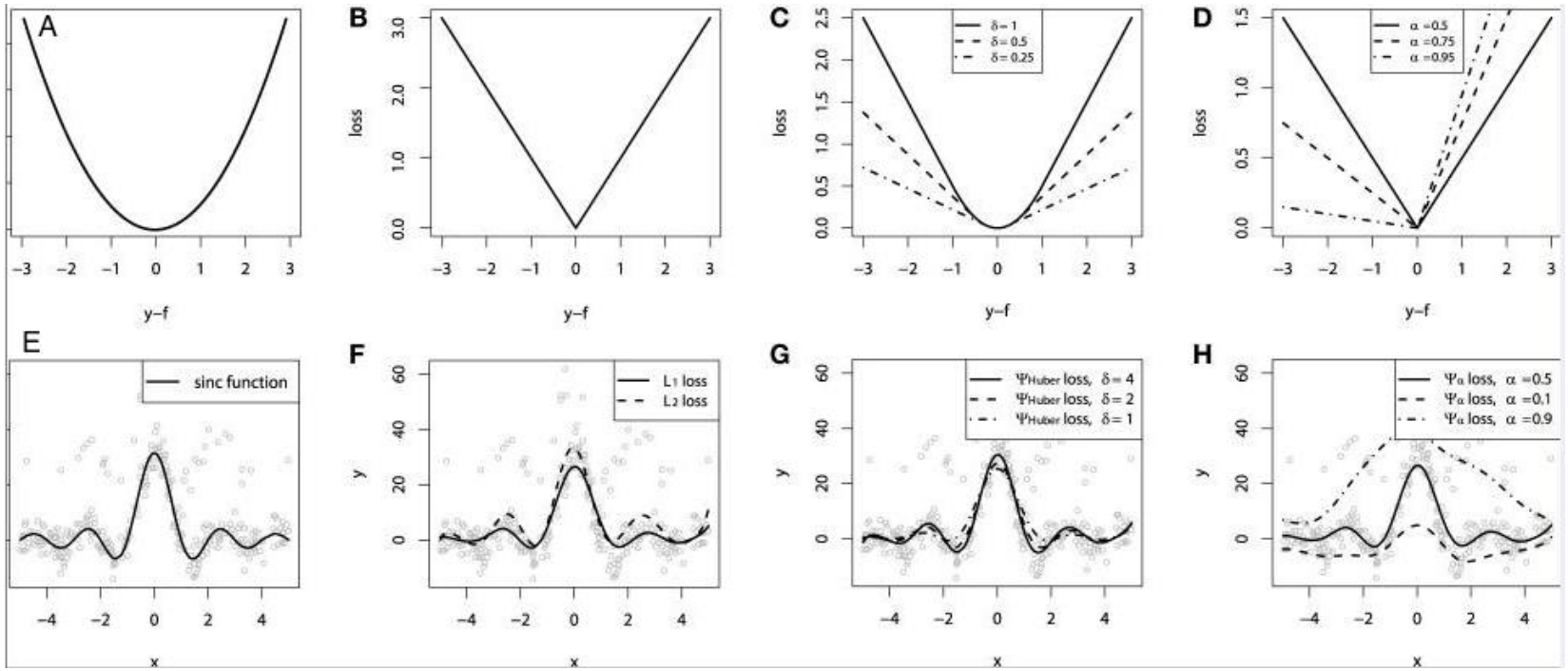
$$L(y, y^p) = \sum_{i=1}^{n} \log(\cosh(y_i^p - y_i))$$



- Quantile loss

$$L_\gamma(y, y^p) = \sum_{i=y_i<y_i^p} (\gamma - 1).\, |y_i - y_i^p| + \sum_{i=y_i \ge y_i^p} (\gamma).\, |y_i - y_i^p|$$

Métricas de evaluación – Modelos de regresión



(A) MSE loss function, (B) MAE loss function, (C) Huber loss function, (D) Quantile loss function

Demonstration of fitting a smooth GBM to a noisy sinc(*x*) data:
(E) original sinc(*x*) function; **(F)** smooth GBM fitted with MSE and MAE loss; **(G)** smooth GBM fitted with Huber loss with $\delta = \{4, 2, 1\}$; **(H)** smooth GBM fitted with Quantile loss with $\alpha = \{0.5, 0.1, 0.9\}$.

Taller