

5_custom_loss

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1 Exercise Custom loss

You are provided with a dataset `house_prices.csv`

Objective: - Find the best **linear model** of the form:

$$\hat{y} = \beta_0 + \beta_1 \cdot x$$

that minimizes a **custom loss function**.

The loss function is defined as:

$$L(y, \hat{y}) = \begin{cases} w \cdot (y - \hat{y})^2 & \text{if } \hat{y} < y, \\ (y - \hat{y})^2 & \text{otherwise.} \end{cases}$$

- **Weight for underestimation:**

$$w = 1.5$$

4. Steps:

- **Step 1:** Read the dataset `house_prices.csv`.
- **Step 2:** Initialize the model parameters β_0 and β_1 with arbitrary values (e.g., $\beta_0 = 0$, $\beta_1 = 1$).
- **Step 3:** Perform **gradient descent** to minimize the custom loss function.
 - Learning rate (η): 0.01.
 - Maximum number of iterations: 1000 (or until the change in loss is negligible).
- **Step 4:** Return the optimized values of β_0 and β_1 .
- **Step 5:** Visualize the data points and the best-fit line.

5. Deliverables:

- Perform one manual iteration of gradient descent for β_0 and β_1 calculations.
- Write a Python implementation of the task to automate gradient descent.
- Plot the data points and the optimized regression line.

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