Business Analytics
Exercise Sheet 4

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Exercise 11: Conditionally Constant Models (3 points)

Describe the the principle behind conditionally constant models. Suggest how a conditionally constant model can be applied to the prediction of multi-class target variables.

Exercise 12: Applying Conditionally Constant Models (3 points)

An icecream shop generates revenue on different situations including the weather and the day of week as summarized in Table 1. Estimate the revenue using the conditionally constant model for maximizing the MSE. Consider conditionality on each predictor variable separately and also on both predictors.

Tabelle 1: Ice cream shop revenue

Weekend	Weather	Revenue (EUR)
no	sunny	2500
no	rainy	1500
no	windy	2000
yes	sunny	4000
yes	rainy	2000
yes	windy	2500

Exercise 13: Weighted Conditionally Constant Model (4 points)

Let us define a new model (Equation 1) called Weighted Conditionally Constant (WCC) model for Mean Square Estimation. The model scales the term in the averaging expression by the cardinality of each conditional scatter group, i.e. the number of elements in the group. The domain of the predictors $x \in \{1 \dots P\}^N$.

$$\hat{y}^{\text{WCC}}(x) \quad := \quad \sum_{v=1}^{P} \frac{\text{card}(D^{Train}|_{x=v})}{\text{card}(D^{Train})} \text{ mean}(\pi_Y(D^{Train}|_{x=v})) \tag{1}$$

Compare the model above with the unconditional mean model. What advantage/disadvantage do you observe?

Submission

- Electronically to wistuba@ismll.de. Text submitted as pdf, code submitted as source files. No archives.