Business Analytics
Exercise Sheet 2

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Exercise 5: Loss Metrics and Best Predictive Values (3 points)

Enumerate the loss metrics and best corresponding predictive values per loss, for both regression and classification. Fill out the column names and row names (?) of the Tables 1 and 2, where each column name is one type of loss and the respective index row the best predictive value.

	MSE	?	?	...
Mean				
?				
?				
...				

Tabelle 1: Regression - Loss vs Best Predictive Values

	MCR	?	?	...
Majority				
?				
?				
...				

Tabelle 2: Classification - Loss vs Best Predictive Values

Exercise 6: Apply Loss Metrics and Best Predictive Values (4 point)

Apply the loss metrics and the best predictive values described in Exercise 5 to the data presented in Table 3. Each cell in the table should correspond to the loss value of applying the column-wise metric to the respective row-wise predicted value. For regression you should use the Revenue column data and for classification the Expectations column. Treat Above as 1 and Below as 0.

(Hint: Best values are computed using the training data, while loss metrics are evaluated on test data).

Year	Revenue (Million $)	Expectations
Train Data		
1998	24	Below Plan
1999	32	Above Plan
2000	25	Below Plan
2001	26	Above Plan
2002	24	Below Plan
2003	30	Above Plan
2004	29	Below Plan
2005	39	Above Plan
2006	35	Below Plan
2007	25	Below Plan
Test Data		
2008	28	Above Plan
2009	21	Below Plan
2010	22	Above Plan
2011	28	Above Plan
2012	23	Below Plan

Tabelle 3: Regression and Classification Data

Exercise 7: Logistic Loss - Best Predictive Value (3 points)

Logistic Loss, defined in Equation 1, is another popular loss for measuring the prediction accuracy of binary targets. What is the best predictive value for the logistic loss? *(Hint: $\frac{\partial L(Y,\hat{Y})}{\partial \hat{Y}} = 0$.)*

$$L(Y, \hat{Y}) = \sum_{Y \in D^{Train}} -Y \log(\hat{Y}) - (1 - Y) \log(1 - \hat{Y}) \tag{1}$$

Submission

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