Name:

Short Quiz 1B

8 September 2025

Question 1: Write the formula of the empirical risk of a predictor f for the absolute value cost, with data $(x_1, y_1), \ldots, (x_n, y_n)$.

Answer:

$$\hat{R}_n(f) = \frac{1}{n} \sum_{i=1}^{n} |y_i - f(x_i)|$$

Question 2: What is the feature matrix of the data $(x_1, y_1), \ldots, (x_n, y_n) \in \mathbb{R}^p \times \mathbb{R}$? How many rows and columns does it have?

Answer: $X = \begin{pmatrix} — x_1^\top — \\ \vdots \\ — x_n^\top — \end{pmatrix}$. It has n rows and p columns.

Question 3: True or false? Circle the right answer. An empirical risk minimizer $\hat{f}$...

T	F	depends on the cost we choose for computing the empirical risk
T	F	is always unique
T	F	can have bad generalization properties

Answer: True — False — True