Math 342W/642/742W

Recitation – Day #12 (3.25.25)

I. Types of Modeling

Fill in the missing cells of the table below regarding the various modeling types:

Response	**Type of Modeling**	g **returns...**	**Example** $\mathcal{A}$
$\mathcal{Y} \subset \mathbb{R}$			OLS
		$\hat{y} \in \{C_1, \ldots, C_k\}$	KNN
$\mathcal{Y} = \{0, 1\}$	Binary Classification		
$\mathcal{Y} = \{0, 1\}$	Probability Estimation		
	Survival/Churn	$\hat{y} \in \mathbb{R}$	
	Count	$\hat{y} \in \{0, 1, \ldots\}$	
$\mathcal{Y} = \{C_1, C_2, \ldots, C_k\}$	Probability Estimation		
$\mathcal{Y} = \{C_1 < C_2 < \ldots < C_k\}$			Proportional Odds
$\mathcal{Y} \in (0, 1)$			Beta Regression

II. Logistic Regression

(i) What is the response space for ***logistic regression***?

(ii) What type of modeling is ***logistic regression***?

(iii) What is the function f_{pr}? And what are we trying to find the "best guess" of?

(iv) What is the ***link function***, Φ that we will use for logistic regression?

(v) What is the candidate set of functions $\mathcal{H}_{pr}$ for approximating f_{pr}?

(vi) What is the name that we give to this model based upon the candidate set $\mathcal{H}_{pr}$?

(vii) What is the algorithm for which we compute $g_{pr} = \mathcal{A}(\mathbb{D}, \mathcal{H}_{pr})$?